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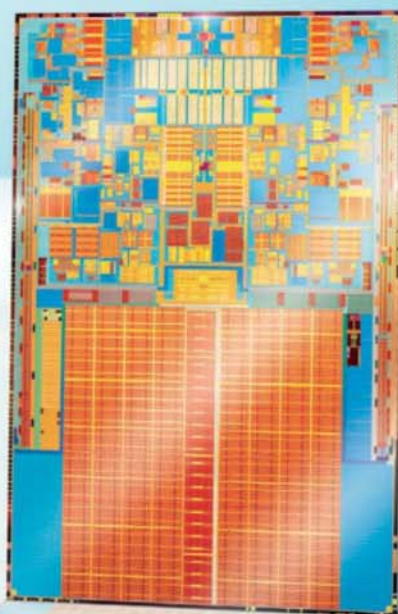
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PC contents

VOL. 27 NO. 9 AUGUST 2008



COVER STORY

What's Next for Windows

57 In the year and a half since Windows Vista's launch, Microsoft has been hard at work on the successor to the much-criticized operating system. What will Windows 7 bring? The company hasn't said much publicly, but we've uncovered some interesting stuff nonetheless. Here's everything we know to date on the future of Windows.



BUYING GUIDE

Prints Charming

61 When you're looking for a printer, the choices can make your head spin. Don't despair—we splice and dice a slew of printers out there to help you find the perfect one.



Build Tomorrow's Network Today

66 Prepare to enter a new age of home connectivity. We tell you how to set up and control your supernetwork with 802.11n, Gigabit Ethernet, and ultrafast fiber.

23 FIRST LOOKS



23 Hardware

Alienware Area-51 m15x
Gateway DX442XP

Plus Quick Looks at the Lenovo IdeaPad U110, the Apple iMac (24-inch Penryn) ... and more

27 Consumer Electronics

LG 47LG60
Netflix Player by Roku
Magellan Maestro 5310
Motorola Moto Z9 (AT&T)
Kodak EasyShare MI033

Plus Quick Looks at the BlackBerry Curve 8330, the Nikon Coolpix P60 ... and more

36 Software

Adobe Dreamweaver CS4 beta
Abbyy FineReader OCR Professional 9.0
OmniPage Professional 16
Plus Quick Looks at SecureZIP, Mixx, Picnik ... and more

42 Business

Lenovo ThinkCentre M57p eco
Cerise Quad-Core Workstation
LaCie Little Big Disk Quadra
Lenovo ThinkVision L190x
HP Color LaserJet CM1312nfi MFP
Plus Quick Looks at the D-Link xStack, the HP ProCurve ... and more

48 The Best Stuff

14 FEEDBACK

Letters from our readers.

FRONT SIDE

17 News

Getting big bucks for old hardware; the new iPhone 3G; online help for dealing with natural disasters; tech companies want to reform the patent system.

20 At a Glance

Strange Google domains; using computers to understand the human brain.

21 Q&A

Eric Brevig, director of *Journey to the Center of the Earth 3D*.

19 Connected Traveler

Take your gadgets to the beach.

OPINIONS

9 First Word: Lance Ulanoff

Windows 7 spells doom for Vista.

52 John C. Dvorak

Microsoft is showing its age.

53 Inside Track: John C. Dvorak

54 Sascha Segan

The problem with copyrights.

98 BACKSPACE

SOLUTIONS

73 Beyond Red-Eye

Photo-editing techniques for non-beginners.

70 Project

Wire your home with Cat 5e.

76 Ask the Experts

Loyd Case and Neil J. Rubenking answer readers' questions.

78 Business

Marketing via podcast; managing drive images.

82 Office

Building and using Word macros.

83 Tech Tips

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Win 7: Already a Threat to Vista

In case you hadn't noticed, there's been a massive shift of interest among the digerati from Microsoft Windows Vista to the largely vaporware Windows 7.

This is testament to how royally screwed-up the Vista go-to-market plan has become. On the one hand, Microsoft insists that Vista is a huge success, with tons of sold licenses and happy customers. On the other, the company recently offered Windows XP Home as a low-cost PC operating system. Clearly, there's a disconnect. Now, even more damaging to Vista, Bill Gates and Steve Ballmer just used an important tech gathering (*The Wall Street Journal's* annual D: All Things Digital conference) to preview major innovations in Windows 7.

If Windows Vista were a child, it would surely feel hurt, neglected, and stunned by the fact that its parents are favoring its still-unborn sibling, Windows 7.

The level of Windows 7 interest should be cause for significant concern in Redmond. Yet I don't see hand-wringing so much as schizophrenia. There's the Vista group, which is gamely marching forward, trying to convince people that Vista is the operating system that they want and that they'll truly love it if they only give it a chance. Then there's the Windows 7 group, which is populated, naturally, by some of the very same people. They're telling you how much better Windows 7 will be.

Gates and Ballmer are also guilty of doublespeak. Each has been quoted extolling the virtues and success of Vista. Yet, days later, they're explaining how Windows 7 will be lighter, faster, and more componentized. Does anyone else besides me think this is nuts?

Now that we know for certain that Windows 7 is over two years away, will anyone want to wait? Sure, Microsoft can tease us with innovations like baked-in virtualization and—bless them—gesture-based multitouch screen support—but a lot can

happen in 24 months. Apple, obviously, won't wait to trump Microsoft.

Back when Apple introduced its super-thin-and-light MacBook Air, I assumed the laptop would include a multitouch screen à la the iPhone and iPod touch. Imagine my disappointment. I don't expect to be disappointed again at the next MacWorld conference. No, I do not have any insider information—Apple's not sharing future plans—but why wouldn't it do this?

Jobs is already exploiting the opening left by Vista's lackluster showing in the marketplace. Those "I'm a Mac, I'm a PC"

• Stop trying to push Vista and hype Windows 7 simultaneously.

• Put Vista into a permanent beta state (call it Vista-B) and offer the code to early adopters for \$25 per license. (Delivering Win 7 alpha code to a tiny group of developers in the fall of this year won't cut it.)

• Deliver monthly code and feature enhancements that slowly but surely transform Vista—on the fly—into Windows 7.

• Hold nothing back and start by delivering multitouch computing by January 2009. It won't be perfect, but people will get excited about the new possibilities.

If Microsoft doesn't want to see something truly scary happen to its OS market share in the next two years, it needs a much more radical approach and timetable.

ads were supposed to disappear because some people thought they were turning off uptight businesspeople who have to use Windows. Then the Vista bashing began and, I think, Apple execs realized that the benefits of this campaign far outweighed the little bit of bad feeling some businesspeople, who secretly want to own a Mac anyway, might have toward Apple.

Perhaps iMacs and MacBooks get touch- and gesture-based interfaces in January, and then Apple does something truly astonishing with OS X in mid-2009. I have no idea what, but whatever the company does, it's still guaranteed to be at least six months ahead of Microsoft.

I'm happy, honestly, that Microsoft is finally showing some real code, and that the company understands the need for a lighter, faster, more user-defined operating system. However, if Microsoft doesn't want to see something truly scary happen to its market share in the next two years, it needs a much more radical approach and timetable. Here are my suggestions:

I'm sure the number of people using the code will be relatively small, but it will ratchet up the buzz for Vista and Windows 7 simultaneously, end the "Vista is worthy, but Windows 7 is even worthier" farce, and pull some of the happy thoughts away from the Apple camp—at least for a little while.

In This Issue

As this issue's cover makes clear, we too at *PCMag* have Windows 7 on the mind. The good news is that we know more about the upcoming operating system than ever before, and what we hear is pretty exciting. Of course, it's not all about stuff you can't buy now. This issue also points you to the best photo and inkjet printers, home network wiring tips, and smart ideas for future-proofing your network until, well, Windows 7 arrives.

TALK TO THE CHIEF You can contact Lance at Lance_Ulanoff@ziffdavis.com. For more of his columns, go to go.pcmag.com/ulanoff.

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**Audit Bureau
of Circulations**

Speed up Your Systems in Real Time

The 8 Essential Benefits of Automatic Defragmentation

Fragmentation is unavoidable. It wreaks havoc on hard disks, causing crashes, hangs and complete system failures.

Diskeeper 2008 eliminates fragmentation—automatically. It's the real-time solution to your performance and reliability problems. Diskeeper is absolutely indispensable. It speeds up boot times, makes applications launch faster and improves the efficiency of backups and anti-virus scans. Diskeeper's benefits have proven time and time again to be a vital part of system administration.

We asked 254 of our customers what were the essential benefits of using Diskeeper. This is what they had to say:

1. Pushes System Performance to Its Peak

"We had one machine that had a failing drive in a RAID 5 array and when we replaced that drive, performance improved by 300%. And then when I ran Diskeeper for a week, again it improved over 300%. A disk intensive process that was taking 1.5 hours is now taking 15 minutes."

2. Reliability Restored

"We use Microsoft® SQL Server®. We were receiving hundreds of messages per day in the log like this one: SQL Server has encountered 21 occurrence(s) of I/O requests taking longer than 15 seconds to complete on file [E:\mssql\data\...]

"We researched this error and found that it is usually caused by badly fragmented hard drives. While our drives are part of a large SAN solution, we were not totally convinced that this should be causing the problem. We downloaded a trial version of Diskeeper and after running it, all of these errors disappeared! We have purchased 5 copies of Diskeeper and we are installing them on all of our production databases with the expectation to never see this error again!"

3. Transparent Defrag Runs Unnoticed

"The server automatically defragments only when there are idle resources. No more worrying about when I can schedule defragmentation, no more worrying about if the defragmentation will cause performance issues. InvisiTasking™ has worked great for us on everything from file and print servers to SQL servers."

4. Defends Critical System Files from Fragmentation

"I have been using Diskeeper at my office on the 63 workstations and 4 servers over the last year. The addition of Frag Shield™ 2.0 eliminates the task of manually changing the MFT. In the past most of my MFTs needed adjustment. Now that

The 8 Essential Benefits that Diskeeper® Provides As chosen by 254 Diskeeper Customers

Transparent Defrag Runs Unnoticed



Reliability Restored



Pushes System Performance to Its Peak



Saves Money and Time



Eliminate Costly Hardware Upgrades



Extreme Condition Defragmentation



Defends Critical System Files from Fragmentation



Speed Up Virus Scans and Boot Ups



Thanks to all our customers who participated.

this function is automatic, I don't have to manually check it."

5. Saves Money and Time

"Prior to installing Diskeeper, we were manually defragmenting. Some of the drives would take hours to defrag and within a few days we would need to defrag again. Installing Diskeeper basically paid for itself within a month by reducing off-hour salaries. Also the defragmented drives perform better and last longer. It's a no-brainer for production machines."

6. Speed Up Virus Scans and Boot Ups

"Diskeeper saves time in doing virus scans, backing up, indexing and searching the files. There are also faster download times for users because of the lower load on the defragmented RAID."

7. Extreme Condition Defragmentation

"One day our SQL Server came to a halt. I did everything: ran

spyware software, deleted numerous .TMP files, ran Windows® update, etc. But nothing got the server to run. Then I installed and ran Diskeeper; I found that the hard drive was horribly fragmented. But after Diskeeper finished defragging the system, the server came up."

8. Eliminate Costly Hardware Upgrades

"We were looking at having to replace or upgrade some of the servers because they were so slow. Since the Diskeeper install, they are performing well enough that we are no longer looking at the upgrades and replacements."

Diskeeper is essential for maximum speed and reliability on networked systems. Accelerate your systems' performance. Restore reliability. Try Diskeeper 2008 for free now!

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FeedBack

Two Critics of Tiny Keyboards

In regard to Lance Ulanoff's First Word column in the June issue ("So Long Desktop, Hello iPhone," page 9), there is a generation of boomers who have happily lived most of their adult lives with ever-shrinking computer keyboards and other input devices. I have three daughters, and they love their small devices. But I think they will soon stop loving them.

Boomers may believe that they will be young forever; that is, of course, false. Age brings, almost universally, loss of visual acuity and manual dexterity. This should mandate that, as this very large generation of adept computer users ages, manufacturers produce computers designed to be used with larger monitors and keyboards with well-isolated keys. Ulanoff suggests exactly the contrary. He will be very sorry when he is older and finds that computer manufacturers no longer make devices that he can use.—*Joe Blanc*

In Lance Ulanoff's June column, he implies that computer users need only a small portable device to get their work done. No one in my office is asking for a smaller screen. Employees of all ages want dual widescreen monitors so that they can do all of the activities that Ulanoff suggests people need to do as well as some real work. I don't know what businesspeople Mr. Ulanoff talks to, but spreadsheets and databases are not too much fun on an iPhone!—*David Plaut*

One Handy Issue

Thanks for putting out another great issue with the May edition. I found much of the information useful. For example, I use Microsoft Office 2007 but have not had the time to trek through all of the ribbons, so your bringing "building blocks" to my attention was a very good thing for me. Also, two pages of Dvorak is good; could you make it three or four, or would it go to his head if you did so?

Q&As, such as that with Nicholas Carr, are very informative, but the questions

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I don't know what businesspeople Mr. Ulanoff talks to, but spreadsheets and databases are not too much fun on an iPhone!

you asked could be more specific. There are many like Carr who are pushing their analyses of all things computing, but they often speak in broad terms about their findings, which leads me to believe they are still thinking about what they claim to have found out.—*John Mutchler*

Product Packaging Predicament

In regard to John Dvorak's Inside Track column (June, page 57), I too am tired of risking life and limb—well, at least limb—trying to break into today's "human-proof" product packaging. My solution is simple.

Upon completing a purchase, I take the item directly to Customer Service and ask an employee there to open it for me. I usually get a puzzled look and a question: "Is there something wrong with it?" I answer, "No, just please open it for me." The employee's look then changes from puzzled to impatient. He searches for an entry point and, not finding one, opens the nearest drawer to find a tool of some sort, usually scissors. He laboriously cuts off one side and hands it back to me. Then I say, "No, please remove the item," eliciting an even more pained look.

This is where the real fun starts. One more cut with the scissors and he starts to use force. There is a little give, but then back to the scissors for the finale. Meanwhile, I am enjoying the process to the fullest. When the package is finally breached and the item is removed, he usually utters something like, "They need to do something about this packaging." I agree, thank him, and leave.—*Craig Erken*

After I read Dvorak's June Inside Track, I thought "John C. Dvorak, my hero!" The "wrap" that most electronics and cables are sold in is sometimes impossible to remove without fear of damage to the product or myself!

How's this for ironic? I purchased a "That was Easy" button from Staples. The problem was, it was anything *but* easy to

remove the button from the packaging. Of course, in the process of trying to remove it, I accidentally hit the button. It mocked me by proclaiming "That was Easy" while I was still struggling to remove it! Too bad the video camera wasn't running. It was a YouTube moment for sure.

It will probably take a lawsuit or two to change packaging practices. So be warned: Buy the bubble, but be sure to film yourself in the struggle to open it. Your heirs will need the evidence.—*Sheryle Davis*

The "Granny" Debate Continues

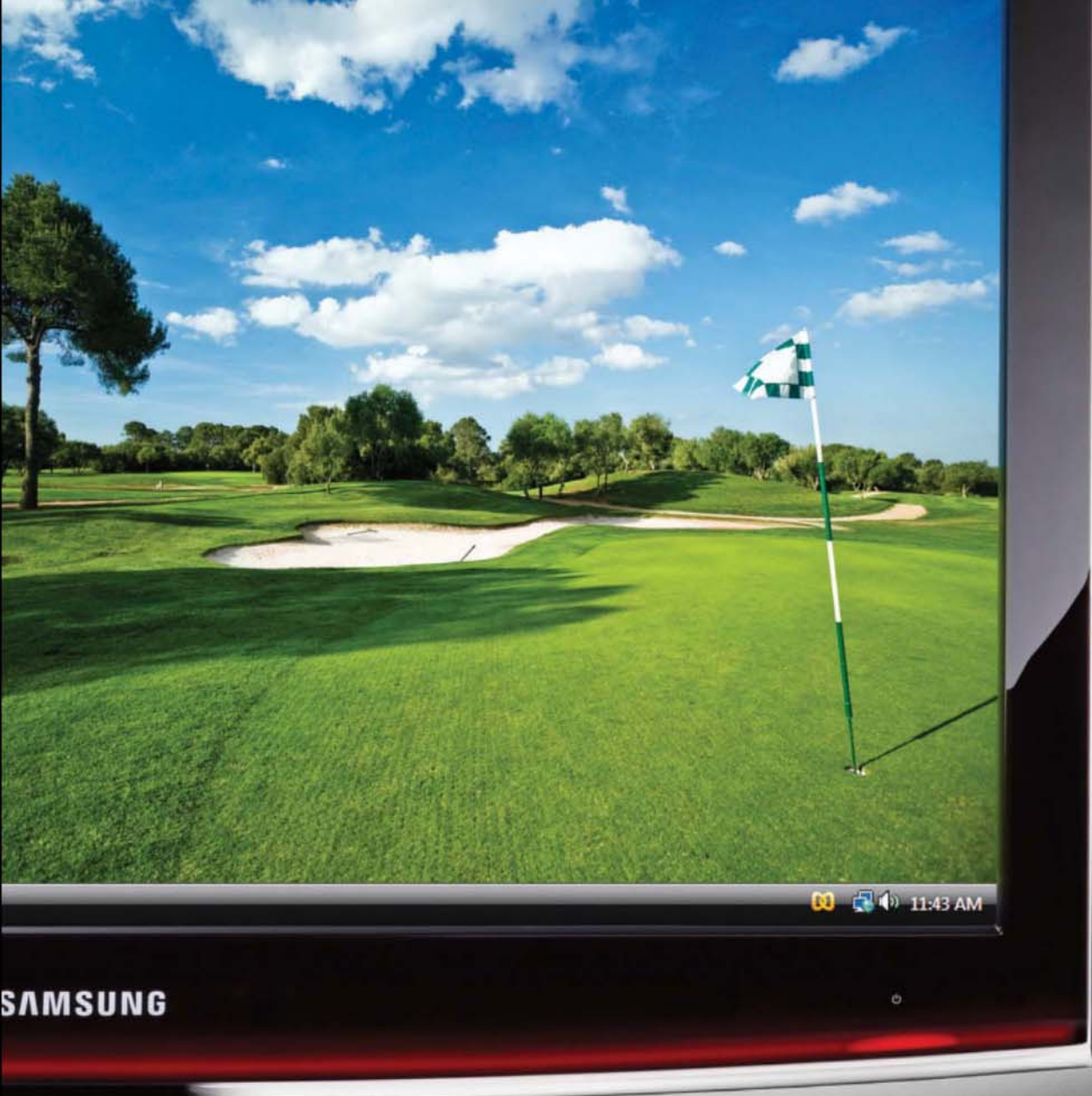
You say Cynthia B. was not the only reader who was offended by Neil J. Rubenking's use of the word *granny* in his online review of Norton 360 Version 2. Too bad. I wonder if Cynthia B. just felt the need to boast of her technical prowess or of achieving the status of grandmother—or have she and the others fallen for the insidious logic of political correctness?

I am certain Neil didn't demean any age/sex/race in his review. He used a shortcut to communicate an idea quickly, something that language has evolved for. Does Cynthia B. also complain about the use of *granny suite* in real estate? If not, that should be how she takes Neil's reference to "granny's computer." If she is offended by *granny suite* as well, there's probably little use in asking her to lighten up, which is a pity. We could all benefit by being a little less touchy.—*Emil Kucera*

CORRECTIONS AND AMPLIFICATIONS

In the cover story of our June issue ("501 Tips for Better Computing," page 63), we mistakenly wrote in the "Watch TV on your Vista PC" tip (page 64) that "For buildings or homes that are cable-ready, high-definition channels are unscrambled or ready to watch without a cable box." Although Microsoft is hard at work developing support for unscrambled cable, also known as clear QAM, currently high-definition unscrambled cable content is incompatible with Windows Media Center.

In the same story, we also suggested in the tip "Sync with multiple PCs" that you can sync music from multiple computers to your iPod or iPhone. While this applies to all models of the iPod, including the iPod Touch, it does not apply to the iPhone.



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What's New from the World of Tech FrontSide

Turning Old Gadgets into Cash

The buyback movement is gaining ground among tech consumers.

Even in this tough economy, consumers persist in indulging their lust for electronics. In fact, U.S. technology buyers are expected to purchase more than 500 million new gadgets this year, according to the Consumer Electronics Association. While this may keep the economy chugging along, it will also add to the growing pile of discarded cell phones, MP3 players, and laptops accumulating in homes across the country.

Though many early adopters and small businesses turn to the Internet to dispose of their old wares—\$5.8 million and \$4.2 billion worth of consumer electronics and computers, respectively, were auctioned on eBay in the first quarter of 2008 alone—there's still a large portion of people who simply stash away their old gadgets after purchasing new ones.

In an attempt to relieve consumers of the clutter in their junk drawers and storage closets, as well as give them a little more money in times of possible recession, some companies are buying back and recycling unwanted devices.



Since fall 2006, California-based TechForward has offered a guaranteed buyback plan that lets consumers lock in a trade-in rate if they replace their gadget within two years. TechForward accepts laptops, desktops, and DVD and MP3 players, among other items. Retail partners include independent West Coast electronics shops, though anyone can purchase a buyback plan through TechForward's Web site or Amazon.com.

Another company offering buybacks is ecoNEW, a fledgling program rolled out this spring by extended service plan provider NEW. In the case of ecoNEW, however, there is no fee. To trade in a gadget, consumers go to a participating retailer's

Web site, such as Sam's Club, register their products, and send them in to receive store credit.

Both companies appeal to the "tech leasers," or people who trade in electronics frequently when the next generations are released. Jade Van Doren, TechForward's CEO, says that his customers (about 12 percent of buyers at the retail stores) are Gen X and Gen Y early adopters. Of all TechForward consumers, approximately 70 percent return their gadgets for buyback dollars, he says. It seems that the remaining 30 percent, in spite of having bought the plan, still can't bear to part with their devices until they break or become obsolete.—Heather Eng

The New iPhone: Faster, Cheaper, and Plentiful

Apple caused its own heat wave this summer by announcing the second-generation iPhone.

Mac fans, tech reporters, and the blogosphere waited with bated breath during Apple CEO Steve Jobs's keynote at this year's World Wide Developers Conference (WWDC). But perhaps as punishment for the media's overzealous leak reporting, Jobs spoke for nearly 90 minutes before revealing the main attraction: the second generation of the Apple iPhone, which now supports 3G networks.

"This is the phone that has changed phones forever," Jobs boasted to the scores of onlookers.

So what is so great about the new iPhone? Though it doesn't look much different from the first-generation model, the big news is that Apple is offering access to AT&T's 3G network, which Jobs says will boost browser speeds 2.8 times. The reborn iPhone will reportedly render pages 36 percent faster than the Nokia N95 and Treo 750.

Apple has also addressed two major complaints about the first-generation model: its high price and limited availability. The 3G



3G ALL THE WAY The iPhone 3G promises faster Web surfing and packs in plenty of new applications.

iPhone will be available in 70 countries on July 11 and will cost \$199 for the 8GB version and \$299 for the 16GB version. Service plans will be standard AT&T voice plans with add-ons of \$30 per month for consumer data, and \$45 per month for business data. Ross Rubin, director of industry analysis at the NPD Group, says that pricing and availability are going to give the new iPhone a major boost, even in a slumping economy.

Another issue Apple tackled is its appeal to specialized users—gamers, bloggers, and businesspeople. Among the apps added are iWork for viewing Word, Excel, and

PowerPoint files; TypePad, a mobile blogging app; Core Location, a location-based social-networking tool; new games such as the fantasy action title Kroll; and even an eBay app.

According to Rubin, the only downside to the iPhone is that it still lacks some cool features, such as a video camera and haptic feedback. Perhaps in the third generation?—*PC Magazine Staff*

A Safety Net for Disaster Relief

The Web can be an invaluable resource for aiding others and finding help in the big storm.

The day after Hurricane Katrina, the Red Cross Web site received more than one million hits. Visitors included volunteers, family members, and—shortly afterward—victims themselves. More than in any previous catastrophe, the Internet was instrumental in speeding help to those who needed it. With experts predicting an above-average hurricane season in the U.S. this year, it's good to know how online resources can help.

Those displaced by disaster can register on the American Red Cross's Safe and Well List (disastersafe.redcross.org). Family members can then check the database to see whether relatives are safe.

A site operated by the International Committee of the Red Cross is dedicated to disasters around the globe. FamilyLinks ICRC (www.familylinks.icrc.org) is updated



A TRUE SEARCH ENGINE The Red Cross's Safe and Well Web site helps family members locate displaced relatives.

when disaster strikes, and can also help family members contact each other across borders. ContactLovedOnes.org (443-992-4890), a free system hosted by Project Genesis and the American Red Cross, enables evacuees who can access a phone—any phone—to leave or receive voice messages for family members.

For relief efforts, sites such as craigslist.org and Freecycle.org have members post notices for temporary or permanent housing, jobs, furniture, and clothes. Freecycle's network has four million members in 4,000 cities worldwide, as well as a team called Emergency Relief Temps that posts helpful info immediately after a disaster.

Of course, a major issue for evacuees is getting Web access. PublicWebStations.com, the brainchild of educational technology consultant Steve Hargadon, is addressing this problem through a new CD that runs a simple Linux OS and the Mozilla browser. With it, you can turn any old computer—Pentium 2 or better—into an Internet kiosk. "Even more so now than three years ago, the Web is important and can offer compelling solutions for dealing with disasters," he says.—*Lisa Zyga*

CONNECTED TRAVELER

Take Your Tech to the Beach

The best waterproof gadgets and cases to keep your gear safe in the surf.



Some people go to the beach to get away from it all, read a book, bask in the sun, and generally just enjoy nature. But there's no law that says you have to leave technology completely behind. For those who prefer to stay a little more connected to the outside world, here are our picks of the must-have beach tech gear.

Plenty of splash-proof and waterproof cases are made to protect your gadgets from moisture and sand, but if you want to go the extra mile—say, take your iPod swimming with you—then check out the line of **(1) Aquapac waterproof protective cases** for cameras, iPods, cell phones, even SLR cameras (\$25 to \$120 direct). Aquapac even provides a three-year guarantee on all its products, so you can rest assured that your gear will remain dry once sealed away. Be sure to throw in a desiccant packet (Aquapac sells a five-pack for \$3, not shown) to absorb natural moisture inside the case.

For splashing in the waves or floating in the pool with your iPod, you'll also need a set of waterproof headphones. Try the **(2) Freestyle**

Audio waterproof earbuds (\$24.95 direct), which are submersible up to 10 feet and feature removable ear wraps. If you prefer to share your music for a beach picnic, the **(3) Ego Waterproof Sound Case** (\$89.99 direct) will play hours' worth of music while protecting your iPod inside a waterproof casing. The Ego device lets you navigate your iPod while it's inside the case, and there are also models for the generation one and two iPod nanos.

While you're at the beach, enjoying full use of your many gadgets, you can make sure you don't run out of juice with the **Reware Juice Bag Solar Beach Tote** (\$249.99 direct). The heavy-duty solar tote incorporates a flexible solar panel that will charge all your devices via a car adapter (not included). But the sun isn't always your friend, so bring along the **(4) Oregon Scientific Personal UV888A monitor** (\$23.96 direct) to keep an eye on the current UV index and temperature. The monitor calculates your recommended sun exposure time based on UV, SPF, and your personal skin type.—Brittany Petersen

BEST of the Internet



FLYTUNES

www.flytunes.fm

A Web service that delivers more than 375 Internet radio stations (including talk, news, sports, and music from multiple genres) to your iPhone or iPod touch.—Alan Henry



FOODARI

www.foodari.com

A food-based social network, with the emphasis on food, not networking. Members get to vote and express their opinions on what recipes and dishes they think are the best.—AH



LINKUP

www.linkup.com

A new site that exposes the hidden job market by finding and aggregating jobs listed only on company Web sites, instead of on job sites like Monster.com.—Jared Preusz

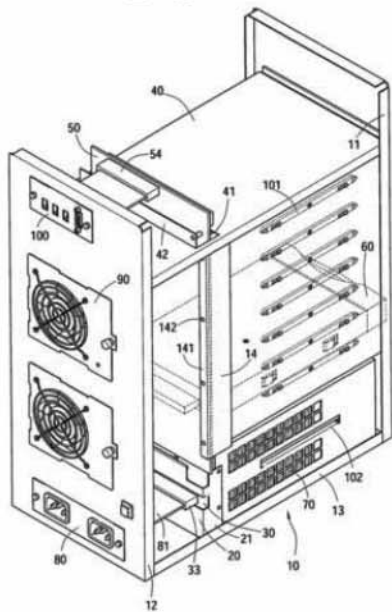
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Giving Patents an Upgrade

Lawsuits are hurting big tech companies, some of which are calling for an overhaul to the patent system.

One tech gadget can contain several thousand components, all of which must have individual patents. Tech companies count on the U.S. Patent and Trademark Office (PTO) to protect their products. But the existence of so many patents on one device can also work to the advantage of “patent trolls.” These are companies or individuals whose *raison d'être* is to gain patents for products they'll never make and to squat on those patents indefinitely, in the hope that, eventually, they can ensnare big tech companies in a lucrative infringement suit. John Noh, a spokesperson for Cisco, offers striking evidence of this practice: From 2005 to 2007 only one of the 30 lawsuits Cisco battled in court was brought by a company that made anything.

In light of the spike of such lawsuits, the tech industry is calling on Congress to reform the Patent Office and patent-related legislation, including limits on damage awards. Legislators have



responded with the Patent Reform Act of 2007, which has passed through the House of Representatives but appears to be stalled in the Senate. The chances of it being signed into law may depend on who is elected the next president in November. Senator Barack Obama has come out largely in support of patent reform, while

PANOPLY OF PATENTS Having sometimes thousands of patented parts in one device leaves a door open for “patent trolls.”

Senator McCain has not commented on it directly in his campaign so far.

Currently, companies suing for patent infringement can be awarded damages based on the sales of the entire product, which manufacturers say is unfair. The bill seeks instead to match damages to the contributing role of the infringing component. Since most products contain thousands of parts, tech firms argue this would lower damages awarded and keep trolls at bay.

Critics of the bill say this provision won't solve patent litigation issues. Instead, they advocate reforming the Patent Office itself, which would improve the quality of patents issued and ensure more clarity and predictability when litigation occurs. Craig Nard, a law professor at Case Western Reserve University, in Cleveland, Ohio, says patent reform should focus on the early stages of the application process.

“If you have mistakes,” Nard says, “you want a system that addresses them earlier on, rather than in the courts.”

—Adam K. Cramer



FUTURE WATCH

Understanding the Brain

As much as we know about the human brain, there's just as much we don't know. But the latest computer research at MIT suggests that we are closer to learning about its secrets than previously believed. Tomaso Poggio, a professor in MIT's Department of Brain and Cognitive Sciences, has been working with his team on a computer model designed to figure out how the brain processes certain kinds of visual information when interpreting a series of photographs. The model they developed turned out to be as good as the best existing computer-vision systems—or, even better, actually as good as humans—at rapidly recognizing certain kinds of complex scenes.

“This is the first time a model has been able to reproduce human behavior on that kind of task,” says Poggio. He adds that his team's success at simulating one of the most complex systems of the brain has changed his perspective in a dramatic way. “It means that we may be closer to understanding how the visual cortex recognizes objects and scenes than I ever thought possible.”—Logan Kugler

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ALIENWARE AREA-51 M15X

Killer Gaming Laptop

Flashy colors and custom paint jobs, once the sole domain of high-end gaming desktops, have been steadily creeping into notebook design for years. The Alienware Area-51 m15x's sophisticated spin on the look, coupled with the best mobile performance and hardware that money can buy, easily earn it an Editors' Choice.

This high-octane laptop is relatively light at 7.8 pounds and is encased in a futuristic silver chassis. Its understated exterior contrasts with the extraor-

dinary color-shifting LEDs within, which outline the touchpad, multimedia buttons, Alienware logo, and more. Each of these areas is highlighted using a palette of 12 colors, which can be controlled through Alienware's "Command Center" software.

The LEDs also frame a 15.4-inch widescreen that boasts an ultrasharp 1,920-by-1,200 resolution and supports 1080p format. The system comes with only a dual-layer DVD burner, but you can add a BD-ROM drive for as little as \$300.

INSIDE

- 23 Hardware
- 27 Consumer Electronics
- 36 Software
- 42 Business
- 48 The Best Stuff

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Gateway P-171XL FX
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**Sony VAIO
VGN-SZ791N**
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**Toshiba Satellite
A305-S6845**
\$1,249 direct
●●●●○

RED denotes Editors' Choice.

Internally, the m15x is configured with a 200GB, 7,200-rpm hard drive, built more for speed than storage capacity. The notebook also features three USB ports, a FireWire port, a 4-in-1 card reader (MMC, MS, MS Pro, SD), and an HDMI port.

The m15x's touch-sensitive multimedia buttons include Bluetooth and Wi-Fi on/off buttons, a button that launches the Command Center, and a Speedometer key—a unique feature that throttles down the speed of the CPU and graphics card to save battery life. The m15x's unusual dual graphics solution is creative: Users can opt for the amp-up nVidia GeForce 8800M GTX graphics card for gaming sessions, then switch to the less-intensive Intel 965GM integrated graphics option to boost battery life when on the go. The laptop drained completely in just 1 hour 49 minutes on the MobileMark 2007

battery test with the discrete graphics card, but the integrated graphics option extended its battery life to just over 3 hours.

In labs testing, the laptop's 3DMark scores broke 10,000 points at low resolutions—a first for gaming laptops. The m15x also delivered high marks on both Crysis and World in Conflict. Although its SYSmark 2007 Preview Overall score didn't lead the category, the m15x's multimedia scores were the best among gaming laptops. Its standout performance was likely helped by the fact that the system's Intel Core 2 Extreme X9000 processor is one of the fastest mobile CPUs out there.

When it comes to choosing a gaming laptop, design shouldn't take a backseat to performance. The m15x balances these two concerns beautifully, giving hard-core gamers a compelling reason to empty their bank accounts.—Cisco Cheng

Specs: Intel Core 2 Extreme X9000 (2.8-GHz) processor; 4GB DDR2 SDRAM; 200GB, 7,200-rpm hard drive; 512MB nVidia GeForce 8800M GTX graphics card; 15.4-inch, 1,920-by-1,200 widescreen; Intel Wireless WiFi Link 4965AGN; 7.8-pound system weight (9.5-pound travel weight); dual-layer DVD+R; three USB ports, one FireWire port; 5.2-Ah lithium ion battery; Windows Vista Home Premium.

PERFORMANCE TESTS

▲ High scores are best.
▼ Low scores are best.
Bold type denotes first place.

	3D ▲	GAMING (fps) ▲		MULTIMEDIA ▼	
	3DMARK06 1,024 x 768**	CRYSIS 1,024 x 768**	WORLD IN CONFLICT 1,024 x 768**	WINDOWS MEDIA ENCODER min:sec	PHOTOSHOP CS3 ACTION SET min:sec
Alienware Area-51 m15x	10,748	49	44	1:04	0:29
Gateway P-171XL FX*	8,930	33	36.8	1:09	0:30

* Reported for comparison. ** Anti-aliasing and anisotropic filtering were set to default.

GATEWAY DX442XP

XP-Retro Multimedia Wiz

The Gateway DX442XP is a new twist on the thousand-dollar PC idea. Rather than spend more money on a discrete graphics solution, the DX442XP instead pours the dollars into the processor, memory, and, in a novel reversal, the Windows XP Pro operating system (which costs money for Gateway to support). If you have a lot of old applications that don't work with Vista, and you need more power than you have now, this is your system.

A sliding door on the DX442XP's front panel hides a pair of front USB ports, a headphone jack, and the slot for the Gateway multimedia removable hard drive.

The DX442XP did well on Photoshop CS3 (28 seconds) and Windows Media Encoder (1:02), which shows that it's a good machine for students and those dabbling in digital media. The DX442XP's SYSmark 2007 Preview Overall score (145) is excellent, considering that few quad-core systems even reach 100 points. About the only disappointing score that the DX442XP turned in was a 306 on 3DMark06. This is due to its integrated GMA 3000 graphics, which are good only for light 3D tasks.

With the DX442XP, you get a lot of quad-core multimedia performance. If you're looking for an off-the-shelf PC with the latest technology but don't want to get a Vista PC, take a long look at this desktop.—Joel Santo Domingo

Specs: 2.4-GHz Intel Core 2 Quad Q6600 processor; 3GB 667-MHz DDR2 SDRAM; 500GB, 7,200-rpm SATA hard drive; 256MB integrated Intel GMA 3000 graphics; Windows XP Pro.

Gateway DX442XP

\$1,000 direct

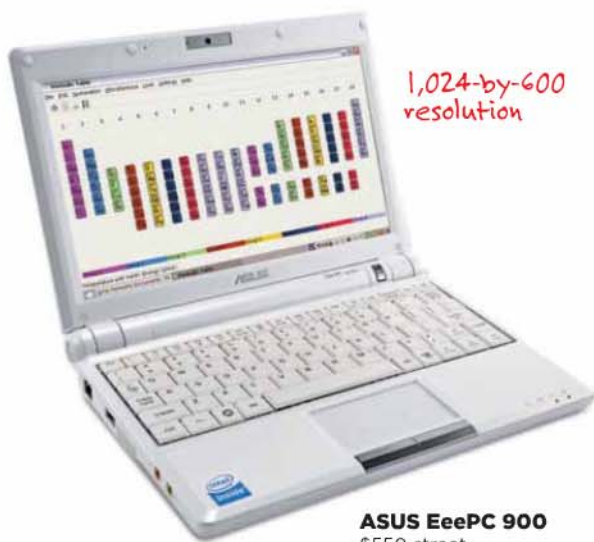
●●●●○

PROS Speedy quad-core performance. Windows XP Pro. Easy to upgrade. 3GB of memory.

CONS No 3D gaming performance. No DX10 3D capability. Lame cartridge drive interface. Some bloatware.

For more:
go.pcmag.com/dx442xp





1,024-by-600
resolution

6.6 by 8.7 by
0.8 inches
(HWD)

ASUS EeePC 900

\$550 street



PROS Amazing bargain. Added 16GB SSD drive. Wider screen. Good speakers. Xandros Linux performs well. Solid software.

CONS Can't stream multimedia from external drive. Cramped keyboard. Stiff mouse buttons.

For more:
go.pcmag.com/eeepc900

ASUS EEEPC 900

Feature-Rich Ultramobile PC

The term *ultramobile PC* (UMPC) used to mean unattractive, dysfunctional, and overpriced. But the ASUS EeePC 900 breaks the mold with its sleek look, full feature set, and low price point.

The feature set is generous for the EeePC 900's 2.2-pound frame: three USB ports, a VGA port, an Ethernet port, a modem, and built-in Wi-Fi (802.11g). ASUS has added an SD and MMC card reader and a 1.3-megapixel webcam. The absence of an optical drive keeps the EeePC small and light. A faster processor than the 900-MHz Intel Celeron M would have been nice, but the 1GB of RAM is double that of the previous version, the \$400 EeePC 4G. Storage capacity is much improved, with a total of 20GB on two solid-state drives. This is a game changer, because now you can put multiple operating systems on this unit. The EeePC 900 comes with either Windows XP Home or Xandros Linux, shipping for the same price.

I couldn't run my performance tests, but according to ASUS, the 42-Wh, four-cell battery should last 3 to 4 hours. As for environmental certifications, the EeePC 900 is RoHS-compliant and meets Energy Star's specifications (though it has yet to be certified). No matter how you slice it, the EeePC 900 is still a tremendous bargain, despite the higher price.—*Cisco Cheng*

Specs: 900-MHz Intel Celeron M processor; 1GB DDR2 SDRAM; 4GB and 16GB SSD; 128MB Intel Graphics Media Accelerator 915; 8.9-inch, 1,024-by-600 screen; 2.2-pound system weight (2.7-pound travel weight); 42-Wh, 5.8-Ah lithium ion battery; Xandros Linux.

SMARTPARTS SP8PRT DIGITAL PICTURE FRAME AND PRINTER

A Double-Duty Device

Two-in-one gadgets often come off as gimmicky, and rarely perform both functions well. The Smartparts SP8PRT Digital Picture Frame and Printer may be an exception. Whether you see it as a frame that prints or a dedicated photo printer with a big preview screen depends on your perspective. The SP8PRT's strength lies in its photo frame function, which offers a bright image, good color quality and a wide angle of view (though it's short on editing options). The frame can show pictures and play movies and audio from a USB key, a memory card, or the internal 120MB flash memory but not, notably, directly from a PC.

The SP8PRT is limited to 4-by-6-inch prints. Its print speed averages a solid 60 seconds per photo, and the pictures boast excellent image quality and are highly water- and scratch-resistant. The SP8PRT loads photo paper on a tightly wound continuous roll that's cut after each image. Unfortunately, the paper is on the thin side, so the prints have a noticeable curl.

The SP8PRT uses a single print pack that combines both the dye and paper rolls. Prints average 55.5 cents each, roughly twice what you'd pay with most dedicated photo printers. It's hard to recommend paying just for the convenience of printing photos from a digital picture frame, but if you're going for gadget appeal, the SP8PRT can't be beat.—*M. David Stone*



The 8-inch photo
frame hides the
thermal-dye
printer from view

Smartparts SP8PRT Digital Picture Frame and Printer

\$300 street



PROS Print pack holds both dye roll and paper. Water-resistant photos. Wide angle of view.

CONS Thin photo paper, with significant curl. No built-in editing features. High cost per print.

For more: go.pcmag.com/sp8prt

Quick Looks

Visit pcmag.com for the full reviews of these and scores of other hardware products.

	PROS	CONS	BOTTOM LINE	SPECS
 <p>Apple iMac (24-inch Penryn) \$1,799 direct ●●●●○</p>	<ul style="list-style-type: none"> • Outperforms some quad-core Windows systems • Windows- and Mac-compatible • Fully HD-capable screen • Recyclable construction • Energy Star 4.0-certified • Minimal bloatware 	<ul style="list-style-type: none"> • No media card slots • Mighty Mouse not so mighty • Other systems are starting to catch up in design • No Blu-ray 	<p>The iconic iMac all-in-one desktop now adds a next-gen Intel Penryn processor to its mix. It's faster, more powerful, and still the one to beat.</p>	<p>2.8-GHz Intel Core 2 Duo E8235; 2GB DDR2 SDRAM; 320GB, 7,200-rpm SATA hard drive; 256MB ATI Radeon HD 2600 Pro graphics card; built-in 24-inch widescreen LCD monitor; Mac OS X 10.5.</p>
 <p>Puget Systems Deluge-i L2 \$6,030 direct ●●●●○</p>	<ul style="list-style-type: none"> • Blazing performance numbers • Impressive overclocking job • No bloatware • Lifetime warranty on tech support and labor (one year for parts) 	<ul style="list-style-type: none"> • Water cooling requires maintenance • Too expensive • A little loud • Difficult to upgrade 	<p>The Puget Systems Deluge-i L2 is an insanely overclocked system made for the hard-core gamer with a spring-loaded wallet. It is a top scorer on some of the benchmark tests, but that doesn't justify the price.</p>	<p>3-GHz Intel Core 2 Extreme QX9650 (overclocked to 4 GHz); 4GB DDR2 SDRAM; 150GB, 10,000-rpm and 750GB, 7,200-rpm SATA hard drives; 256MB nVidia GeForce 8800 GTS graphics cards (SLI); Windows Vista Ultimate.</p>
 <p>Dell XPS 730 H2C \$6,629 direct ●●●●○</p>	<ul style="list-style-type: none"> • Good gaming performance • Cleaner design than previously • More ATX-standard parts • Sealed liquid-cooling system • Can play Crysis (at 1,280 by 1,024 resolution) • Space for upgrades 	<ul style="list-style-type: none"> • Two dual-GPU graphics cards still can't help at the highest resolutions with anti-aliasing and anisotropic filtering • Big and heavy • Still no reset or hard power switch 	<p>The Dell XPS 730 H2C gaming desktop rights some of the wrongs that the XPS 720 had, but still has some problems. It works well, but is missing some of the things you yearn for in a system that costs this much.</p>	<p>3.2-GHz Intel Core 2 Extreme Quad QX9770 (overclocked to 3.8 GHz); 2GB DDR3 SDRAM; 2 SATA hard drives (160GB, 10,000 rpm; 1TB, 7,200 rpm); 2 ATI Radeon HD 3870 X2 graphics cards (CrossFire); Win Vista Home Premium.</p>
 <p>Gateway GT5662 \$750 direct ●●●●○</p>	<ul style="list-style-type: none"> • Amazingly low price for quad-core • Multimedia hard drive bay • DX10 and HD support on graphics card • 3GB of memory 	<ul style="list-style-type: none"> • Removable hard drive uses proprietary USB cable • Bloatware • Only 60-day trial of Norton Internet Security protection • Labelflash optical-disc labeling incompatible with LightScribe 	<p>Quad-core means that the Gateway GT5662 is a more capable budget system. If gaming isn't that important to you but everything else (music, video, photos) is, this is a good choice.</p>	<p>2.2-GHz AMD Phenom 9500; 3GB DDR2 SDRAM; 500GB, 7,200-rpm SATA hard drive; 256MB ATI Radeon 2400 XT graphics card; Windows Vista Home Premium.</p>
 <p>Sony VAIO VGN-FZ485U \$2,199 ●●●●○</p>	<ul style="list-style-type: none"> • Blu-ray burner • nVidia graphics enhances Blu-ray experience and gaming • HDMI-out port • 4GB RAM 	<ul style="list-style-type: none"> • Too expensive • Bloatware • Miserable battery life; extended battery option also expensive • Resolution low for a 15-inch screen • Slow hard drive (4,200 rpm) 	<p>Despite incorporating a Blu-ray burner and 4GB of RAM, the Sony VAIO VGN-FZ485U mainstream media laptop may price out many consumers.</p>	<p>2.1-GHz Intel Core 2 Duo T8100; 4GB DDR2 SDRAM; 300GB, 4,200-rpm hard drive; 256MB nVidia GeForce 8400M GT graphics card; Windows Vista Ultimate. 15.4-inch, 1,280-by-800 screen; 6.0 lbs (7.0 pounds travel).</p>
 <p>Lenovo IdeaPad U110 \$1,899 direct ●●●●○</p>	<ul style="list-style-type: none"> • Sleek, Asian-inspired design • Trendy interior • Full-size keyboard • Very good feature set • Tops in performance in its weight class • Environmentally friendly 	<ul style="list-style-type: none"> • External optical drive is bulky • Sluggish hard drive • Four-cell battery alone will not cut it for travel 	<p>There's a lot to brag about with the tiny Lenovo IdeaPad U110 ultraportable, and it does its magic while managing not to look like a ThinkPad.</p>	<p>1.6-GHz Intel Core 2 Duo L7500; 2GB DDR2 SDRAM; 120GB, 4,200-rpm hard drive; Intel GMA X3100 integrated graphics; Windows Vista Home Premium. 11.1-inch, 1,366-by-768 screen; 2.9 lbs (3.4 lbs travel).</p>
 <p>Toshiba Satellite U405-S2830 \$1,899 direct ●●●●○</p>	<ul style="list-style-type: none"> • Fusion design works well with the LED lights • Intel's latest technology • Internal optical drive with Labelflash • 3GB RAM • Recharging USB ports 	<ul style="list-style-type: none"> • No HDMI • Battery life could be better 	<p>The Toshiba Satellite U405-S2830 media laptop is not that slight in stature, but its Fusion finish and affordable price tag are a must-see.</p>	<p>2.1-GHz Intel Core 2 Duo T8100; 3GB DDR2 SDRAM; 250GB, 5,400-rpm hard drive; 358MB Intel GMA X3100; Windows Vista Home Premium. 13.3-inch, 1,280-by-800 screen; 4.7 lbs (5.6 lbs travel).</p>
 <p>Gateway M-152XL \$1,299 list ●●●●○</p>	<ul style="list-style-type: none"> • Superior performance scores • Fast hard drive • ATI graphics for casual gamers • Slot-loading DVD drive • HDMI port • Inexpensive 	<ul style="list-style-type: none"> • You'll need a bigger battery • Last year's design • Lacks FireWire 	<p>The Gateway M-152XL is a bargain mainstream laptop that pushes performance limits.</p>	<p>2.4-GHz Intel Core 2 Duo T8300; 3GB DDR2 SDRAM; 160GB, 7,200-rpm hard drive; 512MB ATI Mobility Radeon HD 2600 XT graphics card; Vista Home Premium. 15.4-inch, 1,280-by-800 screen; 6.2 lbs (7.3 lbs travel).</p>
 <p>Kodak ESP 3 All-in-One Printer \$129.99 list ●●●●○</p>	<ul style="list-style-type: none"> • Low claimed running costs • Fast photo print speed • Prints, copies, and scans 	<ul style="list-style-type: none"> • Although it lets you copy files from memory cards and USB keys to a computer, it can't print directly from either. 	<p>The Kodak ESP 3 All-in-One Printer lacks some common features, but it delivers reasonably good output quality and a low claimed cost per page.</p>	<p>AIO inkjet; claimed mono cost per page: 2.3 cents; claimed color cost per page: 6.9 cents. 6.9 by 16.6 by 11.8 inches (HWD).</p>
 <p>Epson Stylus NX400 \$99 direct ●●●●○</p>	<ul style="list-style-type: none"> • High-quality photos • Pigment inks are smear-resistant even on plain paper • Surprisingly fast for text and graphics 	<ul style="list-style-type: none"> • Lacks both software utility and front-panel controls for convenient scanning to e-mail or fax programs. 	<p>Although highly photocopier-like, with high-quality photo output, the Epson Stylus NX400 all-in-one printer also handles text and graphics reasonably well.</p>	<p>AIO inkjet; cost per page information not available. 7.2 by 17.7 by 13.5 inches (HWD).</p>

LG 47LG60
\$3,499.99 list



PROS Excellent color quality. Very good image contrast. Superb HD video processing. Slick design with swivel stand.

CONS On the pricey side. Some jagged edges visible in SD material. Even the lowest backlight level setting is too bright for dark rooms.

For more:
go.pcmag.com/47lg60



LG 47LG60

The Best LCD TV We've Ever Seen

Part of the new "Scarlet" series from LG, this pretty, but pricey, HDTV (\$3,499.99 list) offers slick, modern style along with the finest picture quality I've seen from an LCD TV. The set's high-speed LCD technology successfully dampens detail-destroying motion blur while maintaining good color quality at even the widest viewing angles. Videophiles will also appreciate the excellent HD video processor, as well as the best array of picture controls I've ever encountered.

Surrounded by a superthin, glossy-black 2.7-inch bezel with a subtle crimson trim, the 47-inch screen delivers full 1080p resolution (1,920 by 1,080 pixels progressively scanned), making it an ideal match for today's sharpest broadcast and disc-based HD video. The TV's interface includes a Quick Menu that can be summoned via a dedicated button on the remote control, providing easy access to basic picture features such as aspect ratio, backlight level, and picture/sound modes.

Even though it offers near-perfect color reproduction right out of the box, the 47LG60 goes a step further by adding an extremely comprehensive and easy-to-use selection of picture controls. All the controls a professional calibrator could ever want are easily found on this set, and you never have to dig into hidden service menus. The settings also

offer fine granularity, ideal for making precise adjustments.

The 47LG60 produced an average contrast ratio of 1,188:1, with a black-level measurement of 0.14 cd/m²—an impressive result. While most LCD TVs provide a narrow viewing sweet spot for optimal contrast and color saturation, LG incorporates Super-IPS screen technology to maintain picture quality even at extremely wide viewing angles.

SD video performance was excellent. Details in my DVD videos were clear, with natural-looking colors (using the Cinema picture preset). HQV Benchmark DVD test results were also good, though the TV did display a few jagged edges in the benchmark's classic waving-flag scene. Handling of 1080i and 1080p HD material was superb. Fine detail was preserved, and distracting artifacts were effectively eliminated. In addition, the set's motion performance was top-notch, and my challenging 1080i clips were as blur-free as I've ever seen on an LCD HDTV.

With spot-on color quality and HD picture detail, the LG 47LG60 is sure to please even the most critical viewer. Sure, it isn't the least-expensive 47-inch 1080p model around, but you'll be hard pressed to find another set that delivers this level of picture quality, which is why it earns our Editors' Choice.

—Robert Heron

PORTS INCLUDED

CableCARD	0
Component	2
Composite	1
DVI	0
Ethernet	0
FireWire	0
HDMI	4
RF	1
S-Video	0
USB	1
VGA	1

Cool Gadgets for Back to School



Students are the first to pick up on trends, share them with friends, and use the latest gadgets. And when it comes to those gadgets, they're the first to admit enough is never enough. Here are some cool electronics you'll find on back-to-school lists everywhere.

SDI iHome2Go Portable iPod Speaker System with Alarm Clock



This sleek-looking alarm clock will blast your favorite song on your iPod to wake you for your 8:00am class. And on the weekend, you can take it (in its own travel case) on your camping trip to keep you and your friends in tunes. When

it's time to charge your iPod, this portable speaker system will do that, too. Now that's an alarm clock.

Kensington, Ci70LE Wireless Mouse



This stylish and sleek mouse is the key to wire-free bliss wherever you compute. With a wireless range of 10 feet, you can kick back and get comfortable while you surf the Web. The thin design is well-suited for both right- and left-handed people. And since it

doesn't take up much space, it's perfect for cramped lecture halls and dorm rooms.

Logitech Harmony 670 Advanced Universal Remote



Forget juggling two remotes to watch your most recent NetFlix arrival — this one remote can control all your entertainment audio and visual gear. Not just your TV and DVR, either, but also your DVD player, Xbox, audio system, and even your lights and appliances (if they have an IR sensor). The backlit buttons, LCD screen and ergonomic design give you easy, one-click control over your entire electronic domain.

Microsoft Xbox 360 Wireless Controller



Get more out of your Xbox game play with a wireless controller. Available in black or white, the controller has a range of 30 feet, which is perfect for when the excitement of playing GTA or Halo reaches

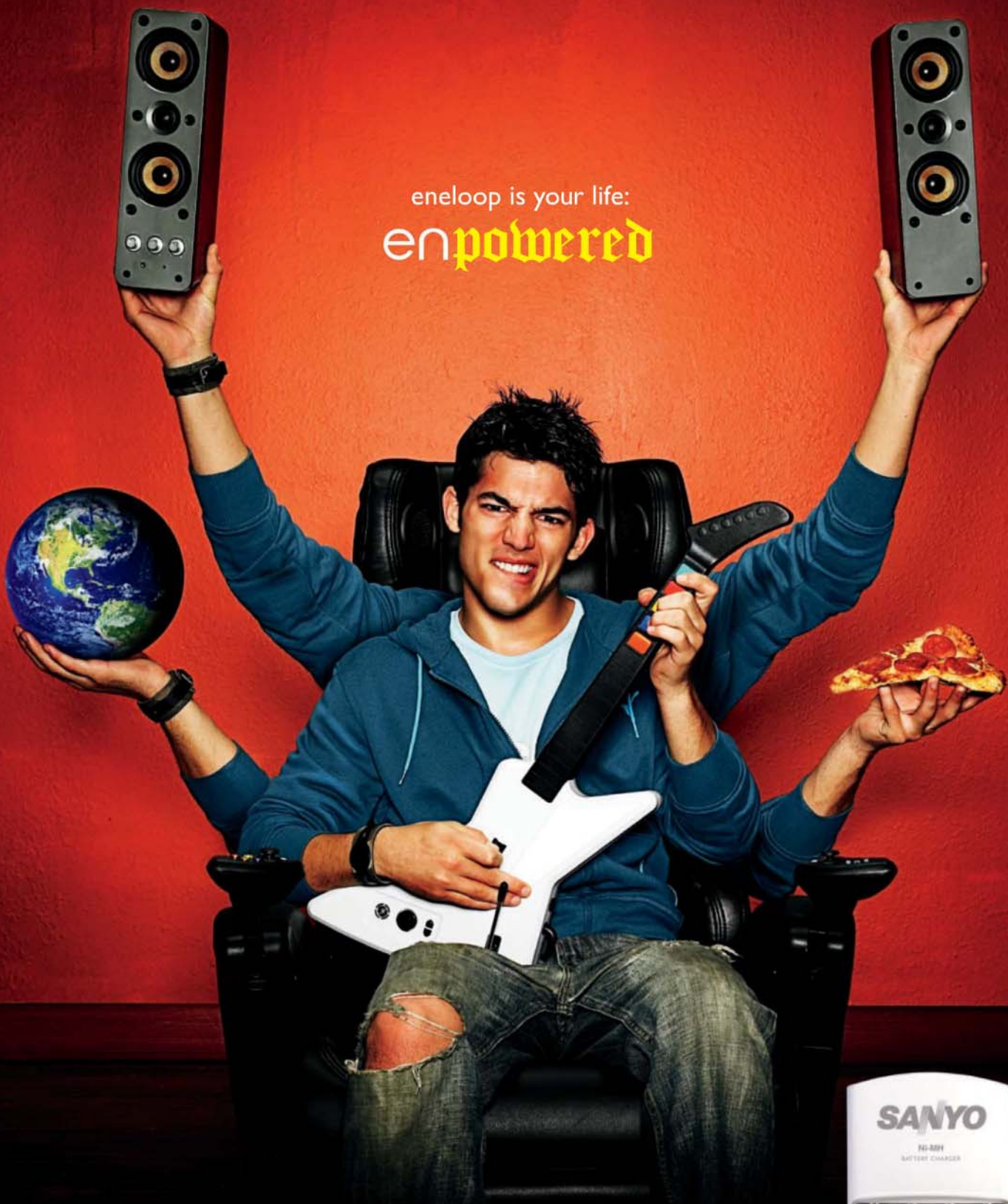
fever pitch, and you just have to pace the room. Also, you no longer have to worry about people tripping over the cord when you're trying to score.

The Guitar Hero III Gibson Les Paul/Kramer Guitar Controller



You thought nothing could replace your secret love for karaoke, that was, until someone put the wireless Guitar Hero Gibson in your hand. Now, you, your roommates, and the guys down the hall all have nightly jam sessions. Whether you're battling through the Legends of Rock or strumming to Aerosmith, one thing's for certain: you're on your way to becoming a rock star.

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enpowered



Warlords to conquer, chords to rip, pizza to order. You don't have time to worry about batteries. Sanyo eneloop is the one battery that's equal to 1000* alkalines. It's reusable. It's recyclable. It's the rechargeable battery with a life as big as yours. **SANYO eneloop. Take Charge.**

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A Rechargeable Battery Recycling Corporation program

Think GAIA
For Life and the Earth

www.eneloopusa.com



Sanyo North America Corporation. All rights reserved. eneloop is a registered trademark of Sanyo Energy USA Corp. All rights reserved. *Estimate based on test results for battery life according to standard JE C8706 (A-A). Actual results may vary depending on use.

NETFLIX PLAYER BY ROKU

More Movies, Less Waiting

Devour Netflix DVDs as soon as you receive them? While you're waiting for the mailman, this set-top box streams on-demand movies from your queue right to your TV. But how does the Roku box compare with the Netflix device of my dreams? My ideal device wouldn't require a PC—check. It would be small, yet have excellent connectivity, including Wi-Fi and HDMI with surround sound—check. It would be simple to set up—check. I'd pay, say, \$100 for the box, but my monthly subscription fee would not increase—check. Lastly, it would provide access to the entire Netflix library—no check there. Well, four out of five ain't bad—in fact, that's pretty fantastic.

What's not to love? The 10,000 on-demand titles available at the time of this writing represent only 10 percent of what's offered by Netflix on DVD, and those titles are mainly older movies or independent films and TV shows. A Netflix representative said that the company intends to expand its library and will offer HD streaming in the future. Also, resolution quality can be an issue if your network is too slow, but as long as it can stream at 1 Mbps or faster, standard-definition videos will look great.

The good certainly outweighs the bad here. If you watch more than 25 movies—ever—the Netflix Player becomes less expensive than renting movies on iTunes.—*Tim Gideon*



Netflix Player by Roku

\$100 direct (rentals are free with an unlimited Netflix account)



PROS Affordable. No PC necessary. Easy setup. Automatically syncs your Instant Queue.

CONS Limited selection of films. No HD support—yet. Streams at low bit rates on slow networks.

For more: go.pcmag.com/netflixplayer



Access your queue and instantly stream titles—right from your sofa



Magellan Maestro 5310

\$599.95 list



PROS Easy-to-read 5-inch screen. Integrated traffic receiver.

CONS Lacks Bluetooth interface and voice commands. Frequent route recalculations.

For more: go.pcmag.com/5310

MAGELLAN MAESTRO 5310

Big-Screen Navigator Is No Bargain

If your tired eyes could use a GPS with a really huge screen, the Maestro 5310 delivers with a sprawling 5-inch (diagonal) display, offering easy-to-read maps and text. But to get that big view, you have to give up some other key features.

The 5310 parallels the previous top-of-the-line Maestro 4250 in many ways. You get a traffic receiver, text-to-speech conversion, multisegment routing, a hearty six-million-entry POI (points-of-interest) database, and the AAA TourBook and roadside assistance. Navteq-based maps for the United States, Canada, and Puerto Rico are included in the onboard internal 2GB of memory, just as in the 4250. What you don't get is voice command or a Bluetooth phone interface—features I'd like to see in a device in this price range.

On the road, the 5310 performed on a par with other Navteq-based devices I've used, except that the device often recalculated my route unnecessarily, offering up the same directions even though I hadn't changed course. This is something that I haven't observed in other Maestro models.

As a member of the bifocal set, I admit to liking the large screen, but at \$600 the Magellan Maestro 5310 should have more features.—*Craig Ellison*

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— TechPowerUp

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— Wired.com



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Bright
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by-240
screen



Motorola MOTO Z9

\$349.99; \$199.99 and up with AT&T contract



PC MAGAZINE EDITORS' CHOICE **PROS** Excellent voice quality. Built-in GPS navigation and video-sharing features. Good Web browser.

CONS Reception isn't quite as strong the V9's.

For more: go.pcmag.com/z9

MOTOROLA MOTO Z9

Superb-Sounding Slider

Essentially a slider version of the excellent RAZR² V9, the Motorola MOTO Z9 wins our Editors' Choice, thanks to its top-notch voice quality. Right now, Motorola's CrystalTalk phones are the cutting edge in this department: They aren't necessarily loud, but they're amazingly clear. The Z9 backs up a very good earpiece with excellent Nuance voice dialing and support for stereo Bluetooth headsets.

The solidly built, metallic Z9 also has an unusually good Web browser in Opera 8; limited e-mail and instant-messaging applications; and AT&T's Video Share and GPS navigation service. AT&T Navigator lets you check out traffic choke points and route around them. (Unfortunately, the GPS works only with AT&T's for-pay service.) The phone functions as an HSDPA 3.6 modem for laptops, so it should get download speeds of around a megabit per second in good network conditions. The Z9's 2-megapixel camera did very well with outdoor daylight shots but had serious trouble with blur on low-light photos.

The Z9 didn't do quite as well as the V9 at capturing weak high-speed signals, preferring instead to drop to AT&T's lower-speed EDGE network. But it's also less expensive than the V9, and with practically the same feature set, it's a good buy.

—Sascha Segan

3-inch LCD is visible even in bright sunlight



Recessed power and shutter buttons are hard to press



KODAK EASYSHARE M1033

Simple Snapshotter with Features to Spare

Kodak EasyShare M1033

\$199.95 direct



PROS Good value. Outstanding daylight shots. Easy-to-use menu system. 720 HD resolution movie recording.

CONS Defaults to auto mode upon boot-up. Underexposed flash. Shutter button is recessed and difficult to find by touch.

For more: go.pcmag.com/m1033

This cute entry-level camera is a step up from Kodak's often mediocre point-and-shoot models. The 10-megapixel EasyShare M1033 comes in six colors and packs in plenty of features, including a big 3-inch LCD and HD video recording. It's a worthy and affordable alternative to Canon's ubiquitous compacts.

Those who don't want to fuss with manual controls will appreciate the M1033's Smart Capture mode, which analyzes the scene and automatically optimizes the settings for each shot. I found that most of the time, it selected the appropriate scene and eliminated some noise in low-light conditions. Image quality was, for the most part, excellent.

My still-life shots were uniform and vivid. Outdoor testing proved to be exceptional, as well; colors in daylight shots were accurate and bright. Flash shooting was a bit of a disappointment, though, with pictures a bit underexposed.

The ability to record HD-quality video at a resolution of 1,280-by-720 and 30 frames per second is unusual for a camera under \$200. You can even zoom in while recording, a rare convenience in a point-and-shooter. Video quality was good, too, with little pixelation and smooth playback.

With its high-quality images and features, this very-easy-to-use basic shooter is sure to please most amateur photographers.—David Gussman



Microsoft Moneual™ recommends Microsoft® Windows Vista™ Home Premium

Welcome To Your Media Playground

INTRODUCING THE MONEUAL 902 ALI



Seagate® Pipeline HD™ drives deliver unprecedented levels of acoustic, power and vibration performance with room for 500 of your favorite movies. With Vista certification making them an ideal solution for media centers, they are the gold standard for high-definition performance and capacity.

MONEUAL 902 ALI

The Moneual 902 Ali is an all-inclusive Home Theater PC, complete with Blu-ray capability and Digital Cable TV Playback. Watch favorite TV shows through Digital Cable on your HDTV while recording episodes for marathon viewings later. Download and store videos and music from the internet, which are then available to you at the touch of a finger through the touch screen LCD. Feel free to unleash your inner child.



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Quick Looks

Visit pcmag.com for the full reviews of these and other consumer electronics products.

RED denotes Editors' Choice.

	PROS	CONS	BOTTOM LINE	SPECS
 <p>Sharp Aquos LC-32D44U \$999.95 list ●●●●○</p>	<ul style="list-style-type: none"> • Excellent HD video processing • No overscan with HD sources • Good picture contrast 	<ul style="list-style-type: none"> • Some smearing in motion scenes • Limited HD color range 	<p>This 32-inch LCD HDTV offers a detailed picture at an attractive price, but some picture-performance quirks may dissuade video purists.</p>	<p>1080i; 1,366-by-768-pixel screen resolution; two HDMI ports, two component video ports, VGA port for PC use, RF input. 22.6 by 30.6 by 9.1 inches (HWD); 29.8 pounds.</p>
 <p>Panasonic DMP-BD30 \$499.95 direct ●●●●○</p>	<ul style="list-style-type: none"> • Speediest disc-load time of standalone BD players we've tested • Fast and easy multimedia browsing • Bitstream audio output with lossless audio formats 	<ul style="list-style-type: none"> • Lacks network connection 	<p>Panasonic's DMP-BD30 loads discs faster than other standalone Blu-ray players while delivering impressive picture quality.</p>	<p>Average disc-load time: 41 seconds; 21-second average from start-up to disc-tray eject; supports BD Profile 1.1. 2.3 by 16.9 by 12.6 inches (HWD).</p>
 <p>Buffalo LinkTheater HD \$199 list ●●●●○</p>	<ul style="list-style-type: none"> • Superb HD video quality over HDMI • Flexible USB connectivity • Simple setup • 24/7 tech support 	<ul style="list-style-type: none"> • No Wi-Fi • Can't play DVDs or stream DivX or Xvid files • No component or S-Video outputs 	<p>The Buffalo LinkTheater HD media extender nails the basics with gorgeous high-definition video streaming, useful HDMI and USB ports, and easy setup and software.</p>	<p>Supports MPEG-2, MPEG-4, WMV9, and H.264 video in 720p and 1080i; MP3, WAV, WMA, AND AAC audio; JPG, BMP, PNG, and GIF photo. 2.0 by 8.3 by 8.3 inches (HWD).</p>
 <p>RIM BlackBerry Curve 8330 (Sprint) \$599.99; \$179.99 (with 2-year contract) ●●●●○</p>	<ul style="list-style-type: none"> • Near-perfect design, including an exceptional keyboard • Solid voice quality • Top-notch e-mail handling • Built-in GPS • Robust software bundle 	<ul style="list-style-type: none"> • Still no document editing • No Wi-Fi • Poorly placed microSDHC card slot 	<p>Sprint's best new smartphone, the Curve 8330 offers an excellent balance of style, power, voice quality, and multimedia prowess.</p>	<p>CDMA; 312-MHz CPU; 32MB on-board RAM; accepts microSDHC; 2.5-inch, 320 by 240 TFT LCD; 2-megapixel camera; 3.5mm headphone jack. 4.2 by 2.4 by 0.6 inches (HWD); 4 ounces.</p>
 <p>Aliph New Jawbone \$129.99 list ●●●●○</p>	<ul style="list-style-type: none"> • Excellent voice quality • Effective noise cancellation • Very comfortable fit • Charges in one hour 	<ul style="list-style-type: none"> • Poor battery life 	<p>Slicker, lighter, and more comfortable to wear, the new Jawbone Bluetooth headset retains the two best virtues of the original: amazing noise suppression and great sound quality.</p>	<p>3 hours 40 minutes of talk time on a single battery charge. 0.4 ounces.</p>
 <p>Nikon Coolpix P60 \$229.95 list ●●●●○</p>	<ul style="list-style-type: none"> • Impressive zoom, focal-length range • Digital viewfinder can sub for LCD • Great color in daylight shots • In-camera editing options 	<ul style="list-style-type: none"> • Slow recycle and start-up • LCD impossible to use in direct sunlight • Bulky for a compact camera • No rechargeable battery option 	<p>If you can put up with its heft and slow response times, this pricey point-and-shooter offers an impressive range of features for an entry-level digital camera.</p>	<p>8.1-megapixel resolution; 5X optical zoom; 2.5-inch LCD; electronic viewfinder; 12MB onboard memory; accepts SD and SDHC flash memory. 2.5 by 3.76 by 1.42 inches (HWD).</p>
 <p>Sony DPF-V900 9" Digital Photo Frame \$249.99 direct ●●●●○</p>	<ul style="list-style-type: none"> • Excellent image quality • Slick design • Hidden IR receiver • Intuitive and responsive interface • In-frame, auto touch-up features 	<ul style="list-style-type: none"> • HDMI and Bluetooth connectivity add to cost • No Wi-Fi • Some glare from glossy display 	<p>In terms of image quality, ease of use, and aesthetics, this is one of the best digital picture frames we've seen, but extra features you may not need inflate its price.</p>	<p>800-by-480-pixel resolution; supports most versions of CF, MMC, SD, xD, Memory Stick, and Microdrive; supports BMP, JPEG, and TIFF files. 9.6-by-6.3-inch frame; 7.4-by-4.4-inch LCD.</p>
 <p>Sennheiser MX W1 \$599.95 list ●●●●○</p>	<ul style="list-style-type: none"> • Outstanding audio performance • Excellent wireless transmission • Good-looking and well packaged 	<ul style="list-style-type: none"> • Prohibitively pricey • Low end can suffer depending on the listener's ear shape 	<p>These wireless earphones would have fared better on our rating scale if the price weren't sky-high. But we do appreciate the incorporation of Kleer technology—vastly superior to Bluetooth—into a quality product.</p>	<p>In-canal; 35-foot wireless range; up to 3 hours of playback per battery charge (mfr. est.). 5.6 ounces.</p>
 <p>Merax Photo Finder GPS \$149.99 list ●●●●○</p>	<ul style="list-style-type: none"> • Sensitive GPS receiver • Easy-to-use software • Helpful status LEDs • Good battery life 	<ul style="list-style-type: none"> • Relatively expensive 	<p>Synchronize the time and date in your digital camera with this tiny geotagging device and you can easily tag your photos with location information and plot them on Google Maps.</p>	<p>4MB of onboard memory to log up to 250,000 points of interest; rechargeable lithium ion battery provides 32 hours of tracking in continuous mode or up to 2,000 hours in standby mode (mfr. est.). 2.5 ounces.</p>
 <p>Livescribe Pulse Smartpen \$199 direct (2GB); \$149 direct (1GB) ●●●●○</p>	<ul style="list-style-type: none"> • Extremely accurate • Great sound detection • Speaker is loud • A bit fat for a pen 	<ul style="list-style-type: none"> • Software doesn't help with organizing notes • Audio picks up scratching sounds from pen • Rolls off flat surfaces easily 	<p>This handy device may be the best way of digitally capturing synchronized written and audio notes.</p>	<p>Compatible with Windows Vista and XP; 2GB version captures 100 hours of audio. 6.1 inches, 1.3 ounces.</p>

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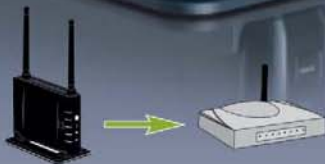


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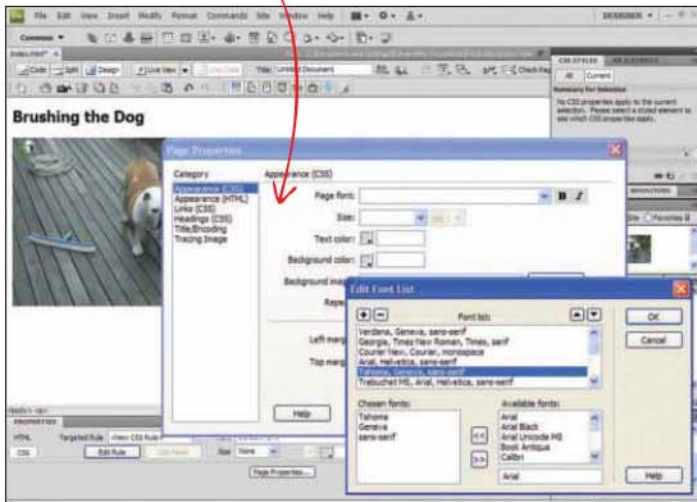
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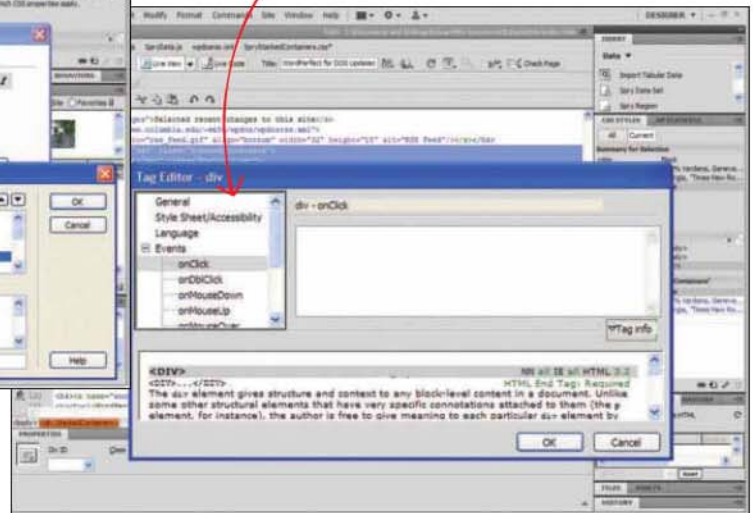
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Edit important HTML and CSS properties from one dialog



HTML tag editor can display info about the tag



Adobe Dreamweaver CS4 beta

Price not set
Not yet rated

PROS Immensely powerful Web-site editor. Now has CSS support throughout. Extensive support for dynamic data views from XML, HTML tables. Tight Photoshop support.

CONS Complex interface.

For more:
go.pcmag.com/dreamcs4beta

ADOBE DREAMWEAVER CS4 BETA

Your Next Web Site Editor?

With Creative Suite 3, Adobe, the power hitter of graphics, knocked one out of the park. From the looks of the Adobe Dreamweaver CS4 beta, history may soon repeat itself. Adobe won't confirm it, but judging from other information the company has released the CS4 suite should arrive sometime between September 2008 and March 2009.

The interface is still overloaded, but I was mightily impressed with the beta—a thorough makeover brings it fully into the 21st century. The most obvious addition, a Related Files toolbar, lets you navigate among all the files your Web page references, including multiple CSS, JavaScript, and XML files.

The terrific, long-awaited Live View Mode displays dynamic data views right inside the app and lets you freeze JavaScript so that you can see the state of dynamic code at any instant for easy debugging. Because the product is designed to produce sites that have the same functionality on both Windows machines and Macs, Live View can't use the Windows-only Internet Explorer engine to display your work. Like the Safari browser, it's based on the open-source WebKit engine, so you'll still have to test your work in IE and Firefox, which you can do from Dreamweaver's menu.

Another improvement: Dreamweaver no longer acts like an old-style HTML editor with modern features tacked on. In Dreamweaver CS3, the Properties panel at the foot of the editing window displayed only HTML format options; you had to go to

the cluttered, stacked sidebar tabs to work with CSS styles. Now the panel has two buttons that switch between displaying controls for applying HTML and CSS tags. I also like the new Code Navigator, which pops up a little window with the hierarchy of the CSS style at the cursor location.

Another feature I like lets you use an HTML table as the data source for a dynamic data view, instead of only XML. The interface for inserting dynamic data from an XML file or HTML table is also improved. Another nifty improvement (which I couldn't yet test) tightly integrates graphics with Photoshop, so when you insert a Photoshop PSD file in a Web page as a JPEG, the JPEG has an icon that's a live link to the original PSD file, letting you update the JPEG automatically when you change the PSD, and vice versa.

Not everything is perfect. I'd be much less annoyed by error messages telling me to save the page before performing a task (like setting up a data view) if a button to save the page were included in the message box. Also, the interface is still a maze of options with unfamiliar names, and whenever I closed an element like the Properties menu, I had to do a lot of menu hunting before I figured out how to open it up again.

Still, the beta makes me think that Dreamweaver CS4 will be the richest Web-site designer ever. We'll see if it will also be the best. Look online for an updated review when the CS4 suite ships.

—Edward Mendelson



WARNING:

THIS PRODUCT
MAY CAUSE GUM
DISEASE AND
TOOTH LOSS

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DIP THAT'S FAST AND EASY.
EVEN IF YOU'LL NEVER ADMIT IT.**



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Abbyy FineReader OCR Professional 9.0

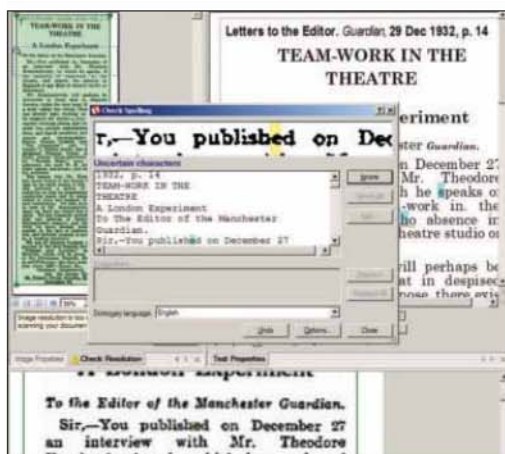
\$399.99 direct; upgrade, \$179.99



PROS Accurate output. Convenient, intuitive proofreading. Clearest interface of any comparable product.

CONS Doesn't reproduce complex page layouts as well as OmniPage.

For more: go.pcmag.com/finerreaderpro9



of mistakes in converting newspaper text, corrections were far easier to make with FineReader.

In the impressive spell-checker, I liked the small window that showed the text I was reviewing, and I especially appreciated the three associated panes. One gave a reduced view of the page, outlining the region I was checking. An enlarged view highlighted that region within the surrounding area, letting me see what I was proofreading in the context of adjacent text. The third pane held the editable text already extracted. If I saw unflagged mistakes or wanted to correct several at once, I could simply switch to the editable text, then jump back to the proofreading window, which I could also move as much as I liked to make multiple changes—a task that's clumsy or impossible with OmniPage.

But FineReader's automation capabilities aren't nearly as powerful. OmniPage has a deeper automation feature set. It also proves superior at reproducing complicated page layouts. For high-volume work, such as archiving, it's probably more efficient. For producing editable text from poor-quality originals, though, or if you plan to do more tweaking, but to fewer documents, FineReader is almost unquestionably the better choice.—EM

ABBYY FINEREADER OCR PROFESSIONAL 9.0

A Fine OCR Application

In many ways, the relatively young Abbyy FineReader Professional outclasses its long-established competitor, OmniPage Professional, now in version 16. FineReader keeps basic tasks simple and gives clear explanations of complex ones. And though both products produced roughly the same number

MANAGING EVERYTHING FROM THE BOTTOM LINE



FINANCIAL
MANAGEMENT

CUSTOMER
MANAGEMENT

PEOPLE
MANAGEMENT

Sage Software helps Steve Kuijt, General Manager of Island Lake Resort in British Columbia, see his unique Catskiing business clearly from every angle. Sage Accpac ERP software allows Steve the flexibility to manage everything from his daily operations to his clients' most unusual requests. It's just one of the many end-to-end solutions we offer small to medium-sized businesses.

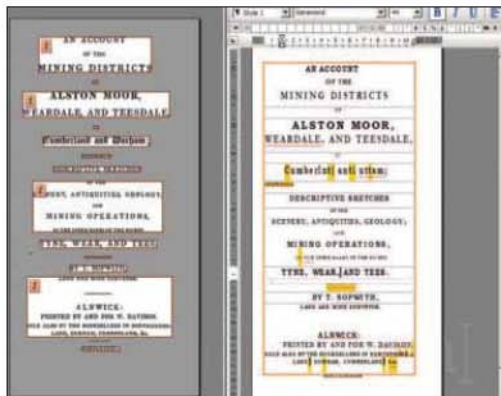
OMNIPAGE PROFESSIONAL 16

OCR App Shows Its Power, Age

An application with a 20-year-legacy can have startling capabilities but can also suffer from an interface cluttered with traces of older, clunkier parts. Case in point: OmniPage Professional 16. It beats its chief rival, Abbyy FineReader OCR Professional 9.0, in automation and often in preserving complex layouts. But for those used to intuitive modern interfaces, interacting with the product can be painful.

Scanning a number of invoices to PDF, I was deeply impressed by the accuracy of the resulting layouts. The product's major strength, though, lies in *Workflows*—customized series of tasks that automate processing. You can use canned workflows or create new ones using the exceptionally helpful wizard. I built a workflow powerful enough to redact or highlight text I specified, bookmark affected pages, and save the output in any supported file format. FineReader's equivalent features aren't as powerful.

But OmniPage doesn't provide the kind of guidance FineReader gives, and tasks requiring heavy



Impressive performance on difficult typefaces

OmniPage Professional 16
\$499.99 direct;
upgrade, \$199.99



PROS Accurate output, especially with complex layouts. Highly flexible automation.

CONS Confusing, complex, sometimes annoying. Ignores some clear signals about what you want the program to do.

For more:
go.pcmag.com/omnipro16

interaction with the product can exasperate. Figuring out how to convert PDF images of text into editable text took a call to the company. The solution lay hidden deep in a dialog box. Proofreading scanned documents caused the worst frustration—one dysfunctional feature was left over from previous versions of the app. If you use proofreading features extensively, you'll find FineReader easier. Corporate users who work with highly complex documents and need automation may prefer OmniPage.—EM

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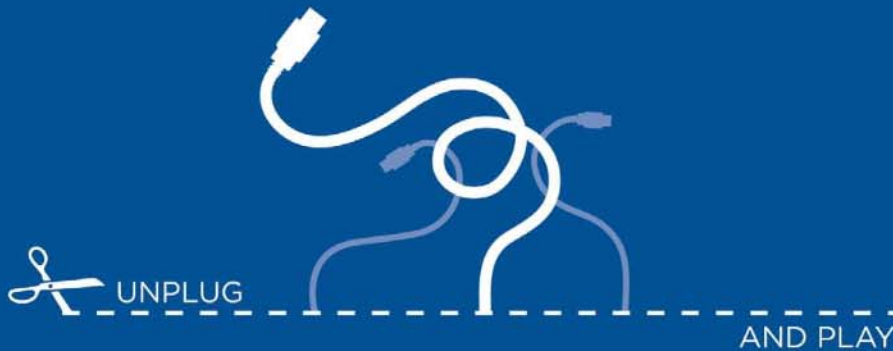
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Quick Looks

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	PROS	CONS	BOTTOM LINE
ANTISPYWARE			
Ad-Aware 2008 Pro \$39.95 direct ●●●●○	<ul style="list-style-type: none"> Now includes antivirus Cleans infestations well Has HOSTS file editor 	<ul style="list-style-type: none"> Poor real-time protection Flags valid programs Queues too many warnings 	Ad-Aware is steadily improving. Spyware removal in this version is excellent, in part due to the new antivirus scanner, and even full scans are relatively speedy. If the developers do something about its years-out-of-date real-time protection, this will be one hot product.
ENCRYPTION SOFTWARE			
Advanced Encrypting File System Data Recovery 4.1 \$149.00 direct ●●●●○	<ul style="list-style-type: none"> Recovers Windows-encrypted files Free trial shows what it can recover 	<ul style="list-style-type: none"> Requires account's password 	If you lose access to Windows-encrypted files (which is far too easy), as long as you can remember the password for the account that did the encrypting, this app will recover those lost files. Its free trial shows exactly what it will do before you pay.
PUBLISHING WEB SITES			
Blurb Free to use; printing costs vary ●●●●○	<ul style="list-style-type: none"> Creates books in minutes Comes in PC and Mac versions Can work off-line Quick import from iPhoto Compatible with Flickr 	<ul style="list-style-type: none"> Sluggish at times Can't obtain or add ISBN numbers No premium editing or marketing capabilities 	This simple, elegant service and downloadable app gives consumers a fun, easy way to self-publish books that emphasize photography, such as wedding albums, portfolios, and vacation compilations.
BACKUP WEB SITES			
FreeDrive 1GB storage, free; 5GB, \$4.95 monthly, \$49.95 yearly ●●●○○	<ul style="list-style-type: none"> Easy to use Plays music, videos Lets you view photos Strong sharing Facebook integration 	<ul style="list-style-type: none"> No subfolders No drag-and-drop Interface needs polishing Rivals offer more free space 	FreeDrive has little to recommend it over Xdrive or Windows Live SkyDrive. Its only real assets are its public community file area and its on-page video player.
Xdrive 5GB storage, free; 50GB, \$9.95 monthly ●●●●○	<ul style="list-style-type: none"> File sharing Easy backup wizard Mobile site Plays audio files Backs up multiple PCs, Macs 	<ul style="list-style-type: none"> No SSL by default Server data is not encrypted No bandwidth control No live support Limited backup features 	With built-in media viewers and players, easy-to-use sharing features, and a relatively generous 5GB of free storage, Xdrive is one of your best online storage options. But it lacks many capabilities and offers a lower level of security than dedicated online backup services provide.
UTILITY SOFTWARE			
Gadwin PrintScreen 4.3 Free ●●●●○	<ul style="list-style-type: none"> Free More capture types than Windows 	<ul style="list-style-type: none"> Config may deter newbies 	If you need to capture screenshots that include the cursor and you prefer a few more options than you'll get with plain old Print Scrn or Vista's snipping tool, Gadwin PrintScreen is well worth the download.
COMMUNITY NEWS WEB SITES			
Mixx Free ●●●●○	<ul style="list-style-type: none"> Clean, simple interface Fast navigation Many topics, subcategories Shows how others voted for your submissions 	<ul style="list-style-type: none"> Users can't vote on comments Sparse content history 	Fast, easy-to-use, fun, and—most of all—informative, Mixx offers a nice change of pace from competing community-driven news sites like Digg.
MEDIA MANAGEMENT WEB SITES			
Phanfare 1GB storage, free; unlimited, \$54.95 yearly ●●●●○	<ul style="list-style-type: none"> Can save short videos No high-res storage limit Cool slideshows with music 	<ul style="list-style-type: none"> Could be more intuitive Online, download apps differ 	Phanfare combines photo and short-video management tools with above-average slideshow capabilities and inexpensive archiving. Still, it needs to be easier to use.
Picnik Basic version, free; Premium, \$24.95 yearly ●●●●○	<ul style="list-style-type: none"> Clean, simple site layout Easy to navigate Fast processing Easy, fun photo editing Cool print options with Qoop 	<ul style="list-style-type: none"> Can't organize photos Not compatible with Shutterfly or Snapfish 	Picnik is a neat, intuitive online photo editor that easily gathers your photos from sites around the Web. It's ideal for anyone who wants to get creative and edit pictures without spending hours learning how.
FILE COMPRESSION UTILITIES			
SecureZIP Standard Edition for Windows Desktop 12.1 Free ●●●●○	<ul style="list-style-type: none"> Handles all common ZIP tasks Obtains, installs, registers digital certificate Integrates with Outlook Integrates with MS Office 	<ul style="list-style-type: none"> No preview in main interface 	SecureZIP does everything you'd expect from a ZIP archive utility and much more. It makes securing your e-mail attachments and messages simple and brings public key cryptography into every user's reach. Get your copy now, as it won't be free forever.



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Lenovo ThinkCentre M57p eco

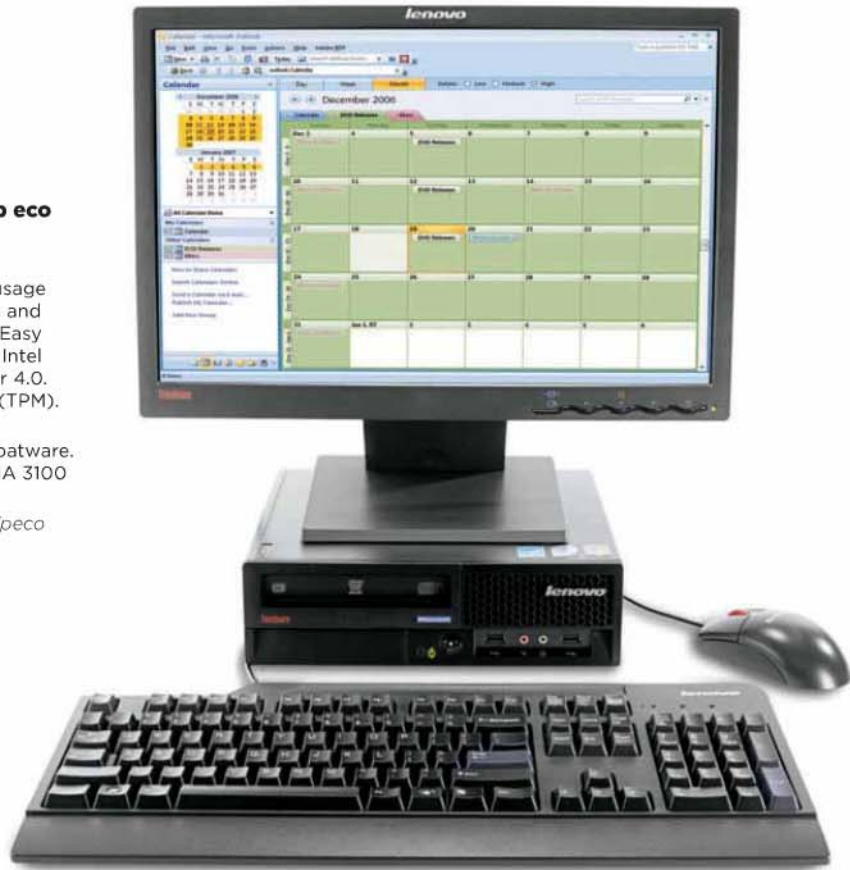
\$1,373 direct



PROS Green PC with energy usage to match. ThinkCentre utilities and IT support. Small form factor. Easy to service. 45-watt processor. Intel vPro. EPEAT Gold. Energy Star 4.0. ThinkVantage Client Security (TPM). Three-year warranty.

CONS No expansion room. Bloatware. Limited to integrated Intel GMA 3100 graphics.

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LENOVO THINKCENTRE M57P ECO

This Desktop Thinks Green

**GREENTECH APPROVED**

EPEAT Gold, RoHS, and Energy Star 4.0

certification, as well as the ability to use less power under a heavy load than a 60W incandescent light bulb, earn the M57p our seal of approval.

An energy-efficient PC can put a major dent in your monthly utility bill, saving hundreds or thousands of dollars. That's what companies stand to gain with the Lenovo ThinkCentre M57p eco, our newest GreenTech Approved desktop.

At just 3.2 by 10.8 by 9.2 inches (HWD), the M57p is small enough to sit in a bracket mount behind a standard LCD monitor. The motherboard and memory are bolted to the bottom panel of the case, so an easy swap can get your users up and running quickly in the event of a hardware failure. Since the M57p comes with Intel's vPro management integration platform, it will interface with corporate system monitoring software and inventory systems.

Since the M57p is housed in a small-form-factor case, it doesn't have space for internal expansion;

the system is limited to integrated Intel GMA 3100 graphics. On the plus side, there are both VGA and DVI ports, and the M57p supports dual monitors.

Our test unit bundled Lenovo's ThinkVantage suite, including useful utilities like Rescue and Recovery. But it also came with loads of bloatware, which prevented it from earning an Editors' Choice.

Regardless, the M57p's Wolfedale-based Core 2 Duo E8400 processor keeps it running quickly and efficiently. The desktop's SYSmark scores were closer to those of high-powered multimedia gaming systems. The M57p also boasts an impressive number of environmental certifications, idling at 39 watts and topping out at just 58W under a heavy load.

The full-featured M57p offers a killer combination of performance, energy saving, and easy serviceability, buttressed by a generous three-year warranty. If your IT folks can dispatch the bloatware, this desktop should keep your users in business for a long time.—*Joel Santo Domingo*

Specs: 3.0-GHz Intel Core 2 Duo E8400 processor; 2GB DDR2 SDRAM; 160GB, 7,200-rpm SATA hard drive; 128MB integrated Intel GMA 3100 graphics; Windows Vista Business.

PERFORMANCE TESTS

▲ High scores are best.

▼ Low scores are best.

Bold type denotes first place.

SYSMARK 2007 PREVIEW ▲

	ELECTRONIC LEARNING	VIDEO CREATION	OFFICE PRODUCTIVITY	3D MODELING	OVERALL
Lenovo ThinkCentre M57p eco	142	123	121	145	132
Dell OptiPlex 755*	93	99	108	112	103

* Editors' Choice, reported for comparison.

Cerise Quad-Core Workstation

\$3,342 direct



PROS RAID 5 array for speedy, safe storage. Really quiet operation. Lots of expansion space. Windows XP instead of Vista. No bloatware.

CONS Windows XP Home. Limited tech-support hours. Pricy.

For more: go.pcmag.com/cerisequad

CERISE QUAD-CORE WORKSTATION

Silent Running

The Cerise Quad-Core Workstation is a model of understated efficiency. No frills, no overclocking, no bloatware, no noise. But its unassuming, silver-colored case conceals a multimedia powerhouse. It's there to get that big photo or video project done, and it does so with aplomb.

The Cerise is powered by a 2.67-GHz Intel Core 2 Quad Q6700, 3GB of 800-MHz DDR2 memory, and a 256MB nVidia GeForce 8600 GT graphics card—a decent and solid DX10-compatible mid-level card. Another of the system's claims to fame is that it's noiseless. Screen vents and a separate chamber for the hard drives help keep the heat and the load on the fans down.

Speaking of hard drives, the Cerise has no less than four 500GB, 7,200-rpm ones. Three of the drives are arranged in a RAID 5 array, which ensures no data lost, even if a drive fails—as they often do when, say, flogged with a string of video-editing projects. And it's fast—the RAID array scored a blazing 6,627 on the Futuremark PCMark05 disk test, far outpacing even a quick eSATA external drive. The downside of RAID 5 is that one drive's space is effectively lost, leaving you a “mere” 1TB of storage space. (There's also the fourth drive, however, which acts as the C: drive but can store data in a pinch.)

The Cerise showed its multimedia chops on our benchmark tests. It finished the Windows Media Encoder test in a respectable 56 seconds and zoomed through the Photoshop CS3 test in a mere 26 seconds. Its CineBench R10 score, indicative of multimedia performance, was a stellar 9,523. On SYSmark 2007 Preview Overall, which measures the ability to do day-to-day business tasks, it scored 131, in line with other high-end PCs. On 3DMark06, an indicator of 3D graphics performance, the Cerise tallied a so-so 5,459—adequate for basic 3D rendering and gaming. (A professional animator would want to go with a higher-end workstation.)



Our test system came with Windows XP Home. Other options are Windows XP Pro, Vista Home Premium, and 32-bit Vista Ultimate.

We've seen screaming rigs (literally and figuratively) at this price point. The Cerise Quad-Core Workstation's quiet efficiency is a refreshing change, and makes the system merit a place on any multimedia pro's short list.—*Joel Santo Domingo*

PERFORMANCE TESTS

▲ High scores are best.
▼ Low scores are best.
Bold type denotes first place.

MULTIMEDIA TESTS

	CINEBENCH R10 ▲	WINDOWS MEDIA ENCODER ▼ min:sec	PHOTOSHOP CS3 ACTION SET ▼ min:sec
Cerise Quad-Core Workstation	9,523	0:56	0:26
Apple iMac (24-inch Penryn)*	5,842	1:03	0:30
Polywell Poly X3800**	9,343	0:42	0:20

* Editors' Choice, reported for comparison.

** Reported for comparison.

LACIE LITTLE BIG DISK QUADRA

Video Pro's Dream Drive

Power users such as video professionals who need to move large files quickly have a new ally. The LaCie Little Big Disk Quadra relies on twin 5,400-rpm, 250GB drives for lightning-fast eSATA transfer rates (60 percent faster than its USB 2.0 performance) and very good FireWire 400 and 800 speeds.

The Little Big Disk Quadra is good both as an external desktop drive and for moving between machines. Technically, it doesn't qualify as a portable hard drive because it requires an AC adapter—at least for USB and eSATA operation. (FireWire 400 and 800 transfers can be powered by the computer.) With its two 2.5-inch drives stacked on top of one another, it measures only 1.6 by 3.3 by 5.5 inches (HWD). The drive is totable enough, but it still looks substantial with its metal frame and cooling fins.

The drive can be formatted for either Windows (NTFS) or Mac (HFS+). Formatting in FAT32 for use with both platforms limits file size to 4GB, which can be easily exceeded by video files. It is loaded



LaCie Little Big Disk Quadra

\$450 list



PROS Quick, portable storage. Four interfaces. Lots of backup software. Bus powered for FireWire 400/800.

CONS Needs a power adapter for USB or eSATA. Drive must be formatted in NTFS or HFS+ at first use. A little pricey. No added performance with USB.

For more:

go.pcmag.com/littlebig

with backup software galore: LaCie I-Click; EMC's Retrospect Express (a full disaster-recovery utility); and LaCie SilverKeeper (Mac). It is also covered by a decent three-year warranty.

The LaCie Little Big Disk Quadra is a unique drive that should come as a welcome addition to any power user's or video professional's hardware stable.—Joel Santo Domingo

LENOVO THINKVISION L190X

Solid Corporate LCD

Its black trim, thin bezel, and pedigree shriek "business." In that arena, the Lenovo ThinkVision L190x delivers, providing the features, performance, and IT tools to excel in the workplace. This 1,280-by-1,024 display includes DVI and analog inputs, plus a four-port USB hub. The L190x provides tilt, swivel, and height adjustment. A sensor automatically changes image orientation when the panel is rotated.

The OSD (on-screen display) lets users control brightness and other functions. IT administrators can remotely manage the L190x through the OSM (on-screen manager). They can set brightness and contrast levels, turn the monitor on or off, and lock the OSD, all from a remote console over the network. TheftAlert sends a message to the remote management console when the monitor has been disconnected from the host system.

Performance is excellent. Colors are bright and well defined, and the display of dark grays was perfect. My only minor nit is slight light-gray weakness,



Screen can pivot

which resulted in some loss of highlight detail.

The L190x isn't for gamers and movie buffs. Its abysmal (25-millisecond) pixel response rate produced artifacts and ghosting in moving images. But the Lenovo ThinkVision L190x is a perfect fit for corporations (with liberal budgets) looking for a solid, general-purpose LCD display with which to stock their employees' desks.—John R. Delaney

Lenovo ThinkVision L190x

\$379.99 direct



PROS IT-friendly. Fully adjustable stand. Strong performance. USB hub.

CONS Pricey. Slow response time.

For more:

go.pcmag.com/l190x



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HP Color LaserJet CM1312nfi MFP

\$499.99 direct



PROS Small size. High-quality output. Standalone fax and copier. Scans and faxes over network.

CONS Low paper capacity. Relatively slow for a color laser.

For more: go.pcmag.com/cm1312nfi



19.1 by 19.6 by 19.3 inches (HWD), 54.5 pounds

HP COLOR LASERJET CM1312NFI MFP

Little Laser, Big Impact

If you're in the market for a color laser all-in-one printer for your home office or small business, you probably expect to have to compromise on features or performance to keep the cost reasonable. The HP Color LaserJet CM1312nfi MFP has it all, and at a price you can justify spending. It's not perfect, but it's impressive enough to earn our Editors' Choice.






The CM1312nfi offers standalone faxing and color-copying capabilities, and can scan to and fax from a PC over a network. Its 50-page automatic document feeder can handle multipage documents and scan legal-size pages, too. The printer also boasts an extensive set of features, including a network connector and memory card slots.

The CM1312nfi is slow for a laser, at 12 pages per minute for monochrome and 8 ppm for color. It makes up for this with superb output. Text quality is nearly the best available. Graphics and photos are good enough for business use.

The one place where the CM1312nfi skimps is paper handling, with a limited capacity of 150 sheets and no upgrade options. Nevertheless, this color laser delivers far more AIO for the price than any of its competitors.—*M. David Stone*

Quick Looks: Switches

Visit pcmag.com for the full reviews of these switches and scores of other business products.

	PROS	CONS	BOTTOM LINE	SPECS
<p><small>RED denotes Editors' Choice.</small></p>  <p>D-Link xStack DGS-3627 \$3,209.99 direct ●●●●○</p>	<ul style="list-style-type: none"> • 10-GigE uplinks • 20-GigE stacking backbone • Excellent VoIP, video support • Good security support 	<ul style="list-style-type: none"> • Requires network expertise • Costlier than an unmanaged switch 	<p>For businesses looking to move beyond unmanaged switched networks, the xStack DGS-3627 is a good starting point.</p>	<p>Twenty-four 10/100/1000-Mbps copper Ethernet ports; 4 SFP uplink ports; freestanding/rack-mount; managed; IPv6-capable; QoS.</p>
 <p>HP ProCurve 1700-24 \$200 street ●●●○○</p>	<ul style="list-style-type: none"> • Very low price • Solid Web management • Advanced QoS features 	<ul style="list-style-type: none"> • 10/100 except for two GigE SFP ports • No PoE 	<p>The 1700-24 may seem a little feature-anemic, but it can give a small-office network a central managed switch at an extremely low price. It can also provide edge switching in a larger network.</p>	<p>Twenty-four 10/100-Mbps copper Ethernet ports; 2 SFP uplink ports; managed; QoS.</p>
 <p>Netgear ProSafe GS724TS \$530 list ●●●●○</p>	<ul style="list-style-type: none"> • Attractive price • 20-GigE stacking backbone • Good video, VoIP support 	<ul style="list-style-type: none"> • Few advanced features • Can stack only 6 switches 	<p>Small businesses looking for a switch that handles basic networking needs and comes at an attractive price will find it with this product.</p>	<p>Twenty-four 10/100/1,000-Mbps copper Ethernet ports; 2 proprietary uplink ports; rack-mount; managed; QoS.</p>
 <p>SMC TigerSwitch SMC6110L2 \$349 list ●●●●○</p>	<ul style="list-style-type: none"> • Web, telnet, console mgmt. • Advanced QoS • 32 layers of IP clustering • Well-rounded feature set 	<ul style="list-style-type: none"> • 10/100 except for 2 SFP ports • No PoE 	<p>IP clustering and multiple layers of QoS make this switch suitable for both edge- and core-switching duties.</p>	<p>Eight 10/100-Mbps copper Ethernet ports; 2 SFP ports that can act as GigE uplink or standard 10/100 Ethernet ports; freestanding; managed; QoS.</p>
 <p>3Com OfficeConnect Gigabit PoE \$495 list ●●●●○</p>	<ul style="list-style-type: none"> • Auto-optimization for VoIP • Intuitive management • Affordable • Power over Ethernet (PoE) across all 10 ports • SFP port 	<ul style="list-style-type: none"> • Tweaking needed for VoIP • Layer 2 only 	<p>Administrators looking for advanced features at a nice price will find it in this OfficeConnect switch.</p>	<p>Ten 10/100/1000-Mbps copper Ethernet ports; 1 SFP uplink (or 10/100/1000-Mbps) port; freestanding; managed; QoS.</p>

Calculus Is the Exploration of Two Basic Ideas. Master Them and Open a New World for Yourself!

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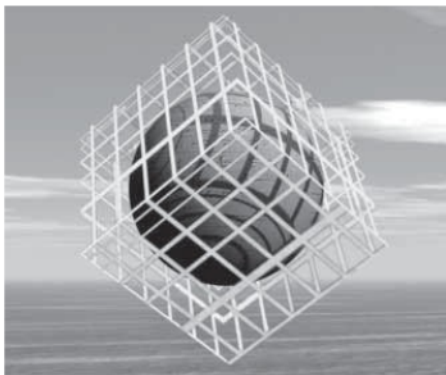
This series is not designed as a college calculus course; rather, it will help you see calculus around you in the everyday world. Every step is in English rather than "mathese." The course takes the approach that every equation is also a sentence that can be understood, and solved, in English.

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Professor Michael Starbird is a distinguished and highly popular teacher with an uncommon talent for making the wonders of mathematics clear to nonmathematicians. He is Professor of Mathematics and a Distinguished Teaching Professor at The University of Texas at Austin. Professor Starbird has won several teaching

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awards, most recently the 2007 Mathematical Association of America Deborah and Franklin Pepper Haimo National Award for Distinguished College or University Teaching of Mathematics, which is limited to three recipients annually from the 27,000 members of the MAA.

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- Heather Clancy
ZDNet.com

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JOHN C. DVORAK

Microsoft, the Spandex Granny

Early on, I was amused when Microsoft would tease the public about its next big thing. The company would describe the product as the coolest thing ever, and the public and the media would lap it up like kittens discovering cream. Microsoft was pretty good at controlling the media, controlling public relations—controlling the public itself. It was the company's heyday.

That game is over. Microsoft is no longer the cute high-school debutante adored by all the boys. Microsoft has turned mid-

MSN link on the start-up page of Windows and thus leave AOL in the lurch. AOL screamed bloody murder. Exactly what right did AOL have to assert itself like this on someone else's property? In the end, Microsoft relented and put an AOL link on the installation of Windows. Was Microsoft paid the kind of money Dell was paid to promote AOL (\$40 per installation, I am told)? I doubt it. All I know is that Microsoft should have told AOL to shove off and do its own operating system.

isn't necessarily ineffective or a bad idea. The point is that the effort should have been spent on making a better product rather than discrediting critics.

This has been the problem ever since Windows 98, when Microsoft probably peaked as the company to be feared. After that it got arrogant and sloppy and dropped the ball. With Windows 98 and then the blockbuster follow-up Windows 2000, the company was on a roll with stunning advancements. XP is just a pretty Windows 2000. Vista is essentially the old hooker with a bad facelift and too much makeup. She also can't remember her customers.

Microsoft cannot seem to arrive at this self-realization, and, instead, hopes to be the debutante forever. The situation is beginning to take on the feeling of a *Tales from the Crypt* story—both sad and creepy. So along comes Windows 7 to save the day.

Let's hope the company doesn't actually call it Windows 7. If it does, we'll have a progression that goes more or less like this: Windows 3, Windows 3.1, Windows 3.5, Windows 95/98, Windows ME, Windows 2000, Windows XP, Windows Vista, Windows 7. What kind of progression is this? It starts with Windows 3, then wanders aimlessly, and ends up as Windows 7? How about Windows 2010? Ugh, no way. I suggest that Microsoft call it Windows Galaxy, and gets it over with. The next code base after that has to be called something other than Windows, please.

Microsoft has seen better days, like an athlete at the end of a career. Some endings are good, some are bad. I hope Microsoft will find one of the good ways. Pretending to be a small, agile company after 20 years isn't working.

DVORAK LIVE ON THE WEB John's Internet TV show airs every Wednesday at 3:30 ET on CrankyGeeks.com. You can download back episodes whenever you like.

Microsoft has seen better days, like an athlete at the end of a career. Some endings are good, some are bad. I hope Microsoft will find one of the good ways.

dle-aged and can't face reality. It's in denial. And it's becoming obvious to everyone, considering the direction in which the company is headed, that the next step in its evolution will be the corporate equivalent of a Spandex granny. It won't be pretty.

Even Bill Gates's boyish charms have worn thin. He still has the well-timed, out-of-the-blue smile, often appearing for no apparent reason. He still has the brain power that we all must respect. And, of course, he has the money. But he is trending more toward John D. Rockefeller in his waning years. His nemesis, Steve Jobs, will supplant him as an icon if not as the rich kid. Jobs will fail, too, once Bill is out of the picture, as Steve will have nobody to chide and needle.

The public needs a leader for an industry now supporting billions of computers, but Microsoft is not that leader. It's a gigantic and often grotesque follower. This despite the fact that it has the most potential as a leader—if someone there can actually lead.

The downturn began when AOL made a fuss over Microsoft's attempt to put the

Historically, Microsoft has acted tough, intimidated the weak, then knuckled under to anyone who would stand up to it. In the 1980s, the company was notorious for keeping Nixonian lists regarding journalists on a whiteboard showing which were "Okay," "Sketchy," or "Needs work." Some believed that those in the last category would be the target of the company in an effort to get them fired.

Nice try. I myself was on a Microsoft blacklist for some totally unknown reason and was not allowed any information about an early version of Windows, apparently because I was considered uncooperative. I only found out about this because of documents unearthed during the discovery process of the *Comes v. Microsoft* lawsuit in Iowa. Who knew? In fact, it made no difference in my approach. And I didn't get fired, in case you haven't noticed. I should note that threats from the company did manage to get me removed as a licensed columnist in *PC Magazine Italy*.

In short, Microsoft has been a dirty player over the years, and this reputation has finally caught up with it. Playing dirty

Dvorak's InsideTrack

The ASUS sneak attack. The most interesting story the media is downplaying is the ASUS announcement that it will have a ROM boot chip on all its motherboards, which will **boot Linux instantly on start-up**. When you flick the switch the machine is instantly on. (It's about time.) Of course, you will have to press another button for the machine to load Windows.

This development is important, since 90 percent of the time all a user wants to do is **surf the Web**. Often when leaving for a trip, I forget to check the weather. To do so, I would have to start up my computer, wait forever for it to boot, then go online. This way, I just flip it on, and boom—I get a browser and the info and I'm done.

It's an **extremely subversive ploy** for a number of reasons. First of all, it gets people used to Linux, gives them a **pain-free experience**, and provides quick rewards. Second, it shows users that—most of the time—**this is all they need**. And finally, it makes Windows **look like a subsystem** not much different from a program that you run under Windows. The psychological effect of this is **profound**, and the results could be **devastating** for Microsoft.

What will develop naturally from such a new architecture will be **Linux replacement apps** for the usual Windows apps. One at a time they will come. Windows will boot only for those **laggard apps**, such as Adobe Photoshop or Illustrator. The rest of the time, users will remain in Linux, which will be perceived as very snappy and responsive—something missing from Windows.

It's obvious to me that ASUS is doing this to help people get familiar enough with Linux so that the company's ultra-portable EeePC can further **expand its market share**. The EeePC runs Linux.

What's interesting is that the other **motherboard makers** are going to have to offer something similar. Since Linux is basically free, the additional cost of this feature is minimal—probably a dollar. This is the **single biggest threat to Microsoft** since the company went public. It's a bigger threat than Google, that's for sure. It's not overt, it's insidious. The **only way** to prevent this is for Microsoft to develop an instant-on mechanism itself.

The Google dilemma. While Microsoft frets about Google, Google is still under attack for copyright infringement regarding the Viacom content that was posted on YouTube. Viacom wants a billion dollars. Google could easily afford the billion if it lost this case, but that would open the **floodgates** and the company **would be forever in court** over this sort of suit. Google now thinks that if it loses, the whole Net will become a mess. Buying YouTube was not a great idea methinks, no matter what the outcome.

Meanwhile, after talking with Brewster Kahle, director of the Internet Archive (www.archive.org), I realize that Google's high-profile book-scanning project seems **sketchy** at best, with Google ending up with all sorts of weird ownerships. The libraries themselves have to **license back** the scans of their own scanned books, according to Kahle. But what is more interesting and sad is the fact that some months back **Microsoft took up the same gauntlet** and started its own scanning project without the possibly onerous contract deals with the libraries. Then after doing 300,000 books Microsoft threw in the towel. It's **canceling the project** and releasing the scans to the libraries and, in the case of public-domain books, to the public.

Microsoft's project was cooler than Google's because it had better search tools, so users could **easily rampage through the collection** for research and quotes. For old books, you could download PDFs. Few people knew of the project, since it was an obscure, under-publicized offshoot of Microsoft's search engine.

Microsoft is letting the big libraries **keep its scanning equipment, too**. It costs about \$30 to fully scan and OCR a 300-page book, so Microsoft spent almost \$10 million. I guess when they got to that point nobody at the company could remember why they were doing this in the first place. Sad indeed.

Vista lament. So after saying that I will not move to Vista until the bugs are fixed, I have been seriously playing with Vista and only now understand in hindsight the **weird comments** made when it was first released. The PC users familiar with Vista hated it, but the Mac users said it was great. I've now concluded that the Mac users were just playing with it and enjoyed its fancy look-and-feel. They never really used it.

Vista isn't completely unusable; **it's simply hard to use**. Menus have been reorganized for no apparent reason, features of XP appear to be missing or need to be turned on from some remote directory, and basic functions are now **obfuscated**. It's as if Microsoft believed all the rubbish about how computers should be appliances that users can't really control.

In a nutshell, Vista manages to be more complicated than XP, **performs more poorly** than XP, and is more expensive than XP. Everyone is shocked that it is not a big success. Meanwhile, Microsoft, which is more enamored of the online business than the software business, plans to roll out Windows 7 in 2009, if we are lucky.

The business could be **in ruins** by then.

WANT MORE DVORAK? John writes a weekly column for our Web site, too. Log on to go.pcmag.com/dvorak. Or you can e-mail him at pcmag@dvorak.org.





SASCHA SEGAN

Copyrights—and Wrongs

Did you break the law today? If you've created something on the Internet, probably. Artists, librarians, tech geeks, and software engineers are now fighting over a miserably shrinking public domain. This isn't what copyright was supposed to be about, and only a popular uprising will stop the current trend.

Copyright law was designed to "promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right

enabled a tremendous explosion of creativity. This is why the Electronic Frontier Foundation (EFF), the Consumer Electronics Association, and the Center for Democracy and Technology are involved in the debate over a new Orphan Works Act, which is supposed to expand the public domain. Your camera-phone photos, YouTube mashups, blog posts, home-burned DVDs, iMovies of your kids—even your Facebook status updates—are creative works.

and nobody else can use my creativity as a springboard to build the next masterpiece.

So now we get to fighting over scraps. Because copyrights now extend until the fall of Western civilization, the Orphan Works Act is supposed to let people reuse stuff whose provenance they can't identify. An example: If you find an old studio photograph of your grandmother as a young girl, Wal-Mart won't copy it for you, because the estate of the photographer (presumably dead) still holds the copyright. The new law would let you rescue Grandma from the depths of time. If you could tell who created the photo, you'd have to pay for the privilege, but if not, you could still use the image.

This sounds good, but the law's opponents, mostly visual artists and photographers, say that all someone needs to do is pretend not to be able to find the creator. You could submit your work to a registry to protect yourself, but that basically amounts to paying protection money.

Yes, a well-written Orphan Works Act that would accommodate everyone is not impossible. The EFF suggests mandating that the copyright registry be free, and that people have to look very, very hard for the original creator. The artists, of course, fear smooth-talking lawyered folks who can convince a judge that they're looking very, very hard when they aren't. The Orphan Works Act isn't the answer. Returning to a sensible copyright regime is.

The power to create that technology gives us is a heady drink, and a vibrant public domain is the best chaser for it. Endless copyright terms don't encourage creativity or protect individual creators. Tell Congress to cut through all this nonsense and enhance the public domain by shortening the length of copyright terms, not by throwing a few scraps and bones to the public.

GET MORE SASCHA For more of his views, visit go.pcmag.com/segan.

The power to create that technology gives us is a heady drink, and a vibrant public domain is the best chaser for it. Endless copyright terms don't promote creativity.

to their respective Writings and Discoveries." That's from the U.S. Constitution, thus the weird capitalization.

The way "the exclusive Right" promotes progress is by giving creators a monopoly over selling their works, or letting them sell the rights to someone else, so they can make a living and thus keep creating.

There's an amusing utopian argument against all copyright, but it assumes too many random acts of generosity. Before copyright, only the wealthy, or those with wealthy patrons, could afford to spend time making art. In our market-oriented world, people will buy things if they consider them affordable and valuable—and if there's a punishment for stealing them. When the price and restrictions are too high, people will steal. The record labels still claim to be shocked—shocked!—that their unacceptable terms lead to thievery. But if there's no punishment at all for stealing, nobody will pay, and fewer things will be created because artists will spend time finding ways to feed their families instead.

One of the great tech stories of the past decade has been how technology has

Right now, more Americans are creating lasting works than ever before, and if you borrow content, you're likely violating copyright law. That's nothing new—do you think Shakespeare had an original plot? If you're concerned about legality, the pool of stuff in the public domain that you can legally use to create new brilliance has gotten proportionally smaller with time.

At some point in the 20th century, most works went from being created by people (who die) to being created by corporations (which are immortal). The immortal corporations wanted their rights to extend to their immortal lifespans. The Constitution prohibits an unlimited copyright term, so they just keep extending the term. They're immortal and you aren't, so they'll keep doing this until people make them stop.

As a creator, I don't see why I should keep profiting from something I wrote even 50 years down the line. There needs to be some term of exclusivity to give the work value, but beyond a certain point, that exclusivity *discourages* creativity. If I can live off one book for 90 years, I have no incentive ever to write another book,

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from work**



SPECIAL REPORT

What's Next for Windows

The launch of Windows Vista seemed gigantic, but the operating system's successor may prove to be Bill Gates's real legacy. What will Windows 7 bring? Here's what we've gleaned to date. *By Edward Mendelson*

If the leaks and rumors about the next Windows version are true, Microsoft has learned a lot from the Vista fiasco. Windows 7 is Microsoft's code name for Vista's successor, and by all accounts it's going to be smaller, lighter, and swifter than Vista. According to numerous published rumors and stories based on leaked developer builds, the forthcoming operating system will be built around a more modular iteration of the Vista kernel. (And the so-called MinWin kernel, which fills just 25MB of

disk space and runs in 40MB of memory, may not be it.)

A modular kernel would have built-in networking but lack a graphical user interface (GUI), which means that Microsoft could build an OS with either an elaborate GUI for eye-candy addicts or a minimal one for use on low-end computers that can't dream of running Vista—the kind of hardware that now runs Linux and that's likely to be found in emerging world markets. Microsoft owns the corporate desk-

top, and has enterprise-management tools no one can match, but Linux made an end run around this market to take over the cheap hardware used everywhere else, and Vista is too big and clumsy ever to catch up. Windows 7 is designed to be swift where it needs to be swift, but even more feature-packed than Vista on high-end systems built for entertainment and the enterprise. (Search online for a widely distributed video of Microsoft's Eric Traut talking about the MinWin concept.)



MOVING GESTURES At the D: All Things Digital conference, Microsoft used a laptop with a specially designed touch screen that accepts multiple simultaneous inputs to show off a new way users will interact with Windows 7.



THE NEW CARTOGRAPHY Built around the multitouch interface Microsoft designed for the Surface computing platform, the new user interface lets users resize and reposition digital photographs and zoom through live map data.

Microsoft hasn't said much officially about Windows 7. During a recent speech in Japan to the Windows Digital Lifestyle Consortium, Bill Gates said that it would "be lower power, take less memory, be more efficient, and have lots more connections up to the mobile phone." He also said, "If you have two personal computers, your files automatically are synchronized between them, so you won't have a lot of work to move that data back and forth." The rest of what we know comes partly through leaks from developers, partly from interpretations of job listings by Microsoft.

To compound the confusion, we don't know when Windows 7 will appear, but dates ranging from late 2008 (unlikely) to 2010 (more plausible) are being bandied about. There's a slightly desperate undertone to Microsoft's public and private remarks about Windows 7, which suggests that the company wants to forget Vista as soon as possible, so you can expect the Redmond giant to move full speed ahead toward shipping Windows 7. About the five-year gap between XP and Vista, Microsoft CEO Steve Ballmer told a group of Microsoft MVP's (Most Valuable Professionals), "We can't ever let that happen again." But whether the Incredible Hulk can successfully morph into the Silver Surfer is an open question.

To see why it's called Windows 7, open a command prompt in your current version and enter the command VER. Under XP SP3, the version number displayed is 5.1.2600. Under Vista SP1, it's 6.0.6001. No prize for guessing the first digit when you run VER in Windows 7's command prompt.

Potential New Features

No one knows exactly what you'll see on the Windows 7 desktop (beyond the fact that Internet Explorer 8 is a certainty), partly because Microsoft always adds and removes features until a late stage in development. But a few intriguing hints are out there, and more are emerging all the time.

First, there will likely be some new, unspecified integration with the Internet "cloud." Windows 7 will have built-in connections with something like Microsoft's "Live Mesh," a Web-based system for sharing and synchronizing folders, learning the online status of friends, and syncing mobile devices with your PC. Live Mesh will be available long before Windows 7 ships, but Windows 7 will apparently include syncing features unavailable elsewhere. Of course, Apple's OS X is already packed with comparable sharing and collaboration features. Microsoft wants Windows to catch up.

Next, you'll probably find automated backup, Microsoft's catch-up answer to Apple's Time Machine. This seems obvious from a leaked screen shot of the new Windows Health Center control panel applet in Windows 7. It looks like the current Security Center applet, but adds an item labeled "Data, Files, Photo, and Music" that indicates whether or not Windows Backup has successfully backed up those files.

We anticipate a new networking setup called HomeGroup, designed for easy sharing of pictures, videos, music, documents, and printers. This is another territory where Apple is far ahead—so much so that I set up printers in my home Windows network with Apple's Bonjour for Windows rather

than wrestling with Microsoft's methods. Whether HomeGroup networking will work with existing hardware, as Apple's Bonjour does, is an open question.

One point Bill Gates emphasized in talking about Windows 7 is its connectivity with cell phones. Gates wasn't specific, but he pointed toward improved file synchronization plus new forms of application sharing and game sharing. One issue he didn't mention was the chilling security nightmare that might result from integration with your wide-open cell phone. The worst-case scenario goes like this: Someone walking behind you slips code into your phone via Bluetooth, code that injects itself into your Windows 7 system. There hasn't been a successful cell-phone virus to date, but tighter integration with desktops could make the platform more attractive to hackers.

Design Goals

Microsoft plans a completely new GUI for versions of Windows 7 running on the kind of high-powered computers that now run Vista. The same team that designed Office 2007 is in charge of this interface, and it's likely we'll see something like the Office 2007 Ribbon in place of Windows' traditional menus and toolbars. Unlike the Office Ribbon, however, the new UI—whatever it finally looks like—will be something you can turn on or off, so corporate users can maintain the same interface they've been using for years, without expensive training.

Many clues to what the Windows 7 development team is thinking about can be found in the Windows Feedback Button found in the early builds. This Feedback

tool invites developers to comment on the five “pillars” on which Windows 7 will be built. Each is divided into a number of scenarios that have only brief and vague descriptions. Here’s a quick description of the pillars, with some guesses at what the associated scenarios might portend for Windows 7. The fullest analysis we’ve seen of these pillars is a long posting by “Bryant” at AeroXperience (www.aeroxp.org).

The Five Pillars

The first pillar is “Specialized for Laptops.” Scenarios associated with it include data security, speed, wireless improvements, synchronization, and power management. One scenario is called “Touch and Tablet Usability,” which may have something to do with the rumors that Microsoft, having been stung by the touch-screen keyboard in Apple’s iPhone, is planning something even better for Windows. Indeed, Microsoft recently announced plans to integrate multitouch technology into Windows 7, making user input possible by touching and gesturing your fingertips around the screen—a way of one-upping the iPhone interface while covering your monitor with greasy fingerprints.

The second pillar is “Designed for Services.” This includes the Live Mesh-type experience I described earlier, plus promised improvements to system upgrades from Vista to Windows 7—upgrades that have never been a Windows strong point. This category also includes “The Family Friendly Web Experience,” which presum-

ably means some form of site filtering, perhaps integrated into Live Mesh.

The third pillar is “Personalized Computing for Everyone,” a category that includes customizable desktops and a vaguely defined scenario in which the desktop can link to local culture—presumably meaning that the desktop will make use of local music and images. This pillar also includes the ability to access your files from anywhere (as in Apple’s Back to My Mac feature), and secure roaming, apparently a scheme to let you access your bookmarks and passwords from anywhere—a convenience that also sounds like a potential security nightmare.

“Optimized for Entertainment,” the fourth pillar, promises home-media streaming, better high-DPI graphics than in Vista, and a new version of Windows Media Center codenamed “Fiji,” already in a late stage of development. Fiji will be built into Vista-based Media Center PCs later this year, but an improved version will clearly go into Windows 7. New Fiji features include QAM support (so digital cable TV signals can flow into a PC without a set-top box) plus support for DirectTV tuners and better guides to available HD programming.

The fifth and last pillar is “Engineered for Ease of Ownership,” which includes improved installation time (10 minutes is one figure being bandied about), and lots of promises about “just works” functionality and similar conveniences that Microsoft has been promising, not very convincingly, since the Windows 95 era.

Virtual Environments

One feature likely to appear is a built-in hypervisor that lets Windows 7 launch and interact with virtual machines like those created by VMware or Microsoft’s own Virtual PC. This is good news for those of us who rely on Windows to run legacy software; Vista made much legacy software unusable, and Windows 7 may reverse that trend. I want—but probably won’t get—tightly integrated virtualization for legacy software. If Microsoft had the wit to grant my wish it would give Windows a major advantage over Apple, which simply abandoned all support for pre-OS X apps.

Microsoft’s strong reasons to push forward with the modular kernel is that it will let some of the company’s best-designed but least-known technologies get used in the real world. For example, Vista has industry-leading support for different alphabets for languages (especially those in Africa) that never had alphabets before—but almost no one who needs that technology can afford to run any computer more powerful than a hand-cranked Linux box. Windows 7 should finally make that technology far more universally accessible.

What Microsoft wants to give you in Windows 7 is a lean, sleek operating system that will stop you dreaming about OS X or Linux. Of course, it may end up giving you yet another bloated, unfriendly operating system that continues the downward spiral begun by Vista. Whether Microsoft can give you what you want is a question that no one can answer—yet. □



A NEW USER INTERFACE? A search for “Windows 7 screens” will uncover hundreds of images online, some leaked from developer builds and others created by enthusiastic fans. It’s unclear which are real, but they’re all definitely neat.



A WORKGROUP AT HOME? You’re not in your office, so why emulate its approach to networking? Rumors suggest Microsoft will introduce a new form of network in Windows 7, called HomeGroup, to ease sharing of pictures, music, and more.



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Prints Charming

Consumers are faced with a glut of choices in buying a printer. Here we dissect the options to help you find your perfect model. *By M. David Stone*

If it's time for you to buy a new printer, get ready for information overload. There is a dizzying array of choices in everything from the type of output (color or monochrome), to technology (laser, inkjet, solid ink, LED, thermal dye, and more), to the choice between single-function printers and all-in-ones (AIOs), also known as multifunction printers (MFPs). AIOs print, scan, and copy and may offer other functions, including some combination of standalone faxing, scanning and e-mailing, faxing from a PC's hard drive, and more.

For office printers, manufacturers tend to divide their models by office size. Unfortunately, these divisions aren't particularly useful. What really matters is not so much the size of your office—or how many people are in it—as what you plan to use the printer for, how much you print, and what level of quality you need.

To narrow the choices down to the best printers for your needs, we will focus here on how you plan to use the printer: at home, in the office, on the go, or exclusively for photos.

A home printer should offer reasonably high-quality photos but also print text and graphics at least well enough for things like schoolwork. Office use implies a need for high-quality text along with appropriate paper handling and speed for the number of pages your office prints (a number that isn't necessarily related to the more common breakdown by office size). An office may also need graphics and photo printing at high enough quality for marketing materials like handouts and mailers. Mobile use requires a



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With laser-class speed, capable paper handling, and a low price, the HP Officejet Pro K5400dtn is an appealing business inkjet for a small office or home office.

light weight and, ideally, a battery. Dedicated and near-dedicated photo printing, finally, requires high-quality photo output above all.

A second issue is whether you need a printer for personal or shared use. Typically, a personal printer connects to one computer by USB cable and is small enough to keep on your desk. Shared printers usually connect through a wired network and are often too big to share a desk with comfortably. Either kind can connect using Wi-Fi as an alternative.

A word on costs: Even people who are highly knowledgeable about all things computer can be misled by focusing on the cost of consumables. It's easy to be shocked by the cost of laser toner cartridges if you're used to the price of inkjet supplies. Cartridges for a low-end color laser can be \$100 or more each, or more than \$400 for a complete set, compared with, say, \$50 or \$60 for an inkjet's black cartridge and single tricolor cartridge. What you should be comparing, however, is not the cost per cartridge but the cost per page.

The yield for toner cartridges is almost always at least 1,000 pages, and often as much as 10,000 pages in more expensive printers. The yield for ink cartridges is most often a few hundred pages. A \$190 black toner cartridge that prints 8,000 pages (such as a Xerox Phaser 6180/N high-capacity cartridge) works out to 2.3 cents per page. A \$23.50 black ink cartridge that yields 500 pages (such as the Brother MFC-685cw black cartridge) works out to 4.7 cents per page. More generally, although most ink cartridges have

lower prices than toner cartridges, printing with the vast majority of inkjets is more expensive than with most lasers.

Even when comparing inkjets with inkjets and lasers with lasers, the rule of thumb is that the less expensive the cartridge, the higher the cost per page. This isn't universally true, but it's true more often than not.

That said, don't get *too* focused on the cost per page. What really matters is the total cost of the printer itself plus the cost of all the pages you'll print over the printer's lifetime. As we've seen in the past, an inexpensive inkjet can be less expensive than other choices in the long run, if you don't print many pages. Or it can be far more expensive, if you print a lot of pages. The same applies to comparing prices between lasers, and between an inkjet and a laser. Which printer will really cost

less ultimately depends on how much you print.

Head spinning yet? No worries. We slice and dice the various printers out there to help you determine the best one for your particular printing needs.

Inkjet Printers

Inkjet printing is the only technology that cuts across all the usage categories we look at in this story. Some models are meant for home use, some are aimed at offices, some are meant to print nothing but photos, and some are designed for mobile printing, complete with batteries. Most inkjets are meant as personal printers or, at most, shared printers for printing a few pages per day. The vast majority are small enough to share a desk with.

That said, the technology is showing up in more and more printers meant for heavier-duty printing, including, at the extreme, HP's floor-standing Edgeline models with five-figure price tags. These are very much the exception, however. Many, if not most, inkjets don't even have a published duty cycle, and for those that do, the ratings are laughably low compared with lasers, often measured in a few thousand pages over the lifetime of the printer. The maximum paper capacity is often as low as 100 sheets, and rarely more than 300 sheets.

Almost any current inkjet can print photos that at least match the quality you'd expect from your local drugstore. The few exceptions are primarily among printers aimed at offices, but even most office inkjets do a decent job with photos. If you pick carefully, you can find all-purpose inkjets



INKJET PRINTER
Epson Stylus NX400

\$99 direct



The Epson Stylus NX400 delivers great-looking photos, smear-resistant text and graphics, and surprisingly fast speed.

whose output rivals photo printers meant for professional photographers.

You can also count on almost any inkjet to print graphics well enough for both internal business use, like printing reports or PowerPoint handouts, and home use, like printing party invitations. Pick carefully, once again, and you can have output quality a graphic artist would be happy with.

The Achilles' heel for inkjets is text quality. Ink tends to bleed into plain paper, which makes it hard for inkjets to print text with the fully professional look you'd want for documents like a résumé or a business proposal. Not surprisingly, inkjets meant for the office generally do better on this score than models meant for home use, but no inkjet prints text with the crisp, clean edges and smear-proof ink you'd get from any laser printer. Worse, most inks will smear if you spill something on them or try using a highlighter.

Inkjets meant for home use fall into two categories: inexpensive inkjets, typically costing far less than \$100 for single-function printers and \$150 or less for all-in-ones, and a highly photocentric category, with prices of \$150 or more for single-function printers and \$300 or more for all-in-ones.

The inkjets in the first price category often include limited photocentric features like the ability to print directly from PictBridge cameras and memory cards. Inkjets in the more expensive category are photocentric to the point where you can effectively use the single-purpose printers as simple photo "kiosks" and the all-in-ones as standalone photo "labs." They



PHOTO PRINTER

Canon Pixma Pro9500

\$849.99 direct



Canon's top-of-the-line desktop photo printer, the Canon Pixma Pro9500, uses ten ink tanks to print high-quality photos and graphics.

typically come with relatively large LCDs for previewing photos, in some cases with touch-screen LCDs for giving commands. All-in-ones add the ability to scan 35mm film and print high-quality photos directly from slides, negatives, prints, memory cards, and cameras. Less common features include built-in optical drives to let you store images to or print from discs, and the ability to print labels directly onto optical discs.

Office inkjets include the few single-function printers and all-in-ones designed for relatively heavy-duty printing. They also include any AIO that adds office-centric features to the home all-in-ones' ability to print, scan, and copy. Typically, they will work as standalone fax machines; fax directly from your PC's hard drive; and scan to an e-mail easily, using your PC's e-mail program and automatically adding the scan as an attachment.

Office all-in-ones also add an automatic document feeder (ADF) for easy scanning,

faxing, and copying of multipage documents, and they offer paper capacities of 200 sheets or more, often with a built-in duplexer (for two-sided copying). They usually leave out photocentric features.

Inkjets, finally, are the only kind of printer with models for mobile use (other than a few thermal-dye printers that need special thermal paper) and with all-in-one models specifically meant for the dual role of home and home office. Mobile printers typically have low paper capacities but few other compromises. They tend to be pricier than other inkjets, however, at about \$250.

Dual-purpose all-in-ones include office-centric features along with photocentric features. To help keep prices down despite all the features, some, but not all, cut corners on paper handling and speed. These are a good fit if you need a single printer for your home and home office, with extra functions like faxing, but don't usually print many pages.

PHOTO PRINTER

HP Photosmart Pro B9180 Photo Printer

\$699.99 direct



The HP Photosmart Pro B9180 prints top-quality photos (and graphics, for that matter) at sizes up to 13 by 44 inches.



Photo Printers

Most printers, including most so-called photo inkjet printers, have one thing in common: They're meant for all-purpose printing—text, graphics, and photos. Some do a better job with some kinds of output than with others, but they aren't designed for one specific kind of output. Dedicated and near-dedicated photo printers are different. They're designed with one goal in mind: printing high-quality photos on photo paper.

In theory, these photo printers can use any technology. In practice, the only two technologies (so far) that offer true photo quality are inkjet and thermal dye (also known by the misnomer "dye sublimation"). Thermal-dye printers use heat

FEATURES AND PERFORMANCE

All scores in min:sec.
Low scores are best.

Bold type denotes first place.

	RATING	PRICE	TYPE				CONNECTIVITY			CLAIMED COST PER PAGE (CENTS) [†]		BUSINESS APPLICATIONS: DEFAULT SETTINGS (MIN:SEC)	
			HOME	OFFICE	MOBILE	PHOTO	USB	ETHERNET	WI-FI	BLACK AND WHITE	COLOR/PHOTO ‡	ADOBE ADOBE ACROBAT 6.0	
												4 pages text and photos (portrait mode)	4 pages text and photos (landscape mode)
INKJET PRINTERS													
Brother MFC-685cw	●●●○○	\$129.99 direct	●	●			●	●		4.7	14.4	2:20	2:34
Canon Pixma iP4500	●●●●○	\$249.99 direct	●	●		●	●			3.1	8.8	1:29	1:22
Canon Pixma MP970	●●●●○	\$229.99 direct	●			●	●	●		3.2	9.5	2:05	2:10
Canon Pixma MX850	●●●●○	\$149.99 direct	●	●		●	●	●		3.2	9.3	1:31	1:22
Dell 948 All-in-One	●●●○○	\$250 list	●	●		●		●		5.7	14.3	3:42	3:56
Epson Stylus NX400	●●●●○	\$179.99 direct	●			●				N/A ¹	N/A ¹	1:33	1:29
HP Officejet H470	●●●●○	\$299.99 direct			●		●	●		4.2	10.4	2:32	2:24
HP Officejet Pro K5400dtn	●●●●○	\$279.99 direct		●			●	●		1.4	5.8	1:06	1:11
HP Officejet Pro L7680	●●●●○	\$149.99 direct		●			●	●	●	1.4	5.8	1:06	1:12
HP Photosmart D7460	●●●●○	\$99 direct	●			●	●	●	●	2.4	10.4	1:56	1:50
Kodak ESP 3 All-in-One	●●●○○	\$399.99 direct	●			●	●			2.3	6.9	2:32	2:33
Lexmark X9575 Professional	●●●○○	\$129.99 direct	●	●			●	●	●	5.2	11.2	3:06	3:24
Ricoh Aficio GX3050N	●●●○○	\$249.99 direct		●			●	●		2.2	13	0:33	0:32
DEDICATED/PROSUMER PHOTO PRINTERS													
Canon Pixma mini320	●●●●○	\$179.99 list	●		●	●	●			—	30	N/A	N/A
Canon Pixma Pro9000	●●●●○	\$199.99 direct				●	●			—	28.9–68.7	2:22	2:15
Canon Pixma Pro9500	●●●●○	\$149.99 direct				●	●			—	34.6–60.5	4:34	4:17
Canon Selphy ES2	●●●●○	\$229.99 direct	●		●	●	●			—	28	N/A	N/A
Epson PictureMate Dash	●●●●○	\$149.99 direct	●		●	●	●			—	25.3	N/A	N/A
Epson PictureMate Zoom	●●●●○	\$249.99 direct	●		●	●	●			—	25.3	N/A	N/A
Epson Stylus Photo 1400	●●●●○	\$499.99 list	●			●	●			—	N/A ²	2:06	2:01
Epson Stylus Photo R1900	●●●●○	\$849.99 direct				●	●			—	N/A ²	2:26	2:24
HP Photosmart A626	●●●●○	\$549.99 direct	●		●	●	●			—	29.2	N/A	N/A
HP Photosmart A826	●●●●○	\$299.99 direct	●			●	●			—	29.2	N/A	N/A
HP Photosmart Pro B9180	●●●●○	\$699.99 direct				●	●	●		—	28.7	1:35	1:32

RED denotes Editors' Choice. †Cost based on current pricing and yield data and most economical ink cartridges; photo costs include paper (4-by-6 photos).
‡ Photo printers were tested using 4-by-6 paper. N/A—Not applicable: This printer could not run this test. N/A¹: Testing in progress. N/A²: Not rated.

to transfer dye from plastic rolls to paper with a plastic coating.

Dedicated photo printers—aimed primarily at home users who want to print their photos with as little work as possible—are easy to spot: Practically if not literally, you can't use them for anything but photos. Thermal-dye paper looks and feels like photo paper, so it's useless for standard printing. Also, most dedicated photo printers are limited to small formats, with a maximum paper size of 4 by 6 inches, although some can print 4-by-12-inch panoramas as well. For those who want to print larger photos, a few small-format printers can print at up to 5 by 7 inches.

The output from virtually any current dedicated photo printer is at least a match for what you would expect from your local drugstore, at comparable prices for printing on the spot. Most manufacturers sell print packs of ink and paper that work out to between 25 and 30 cents per photo for the most economical packs. Prices for the printers range from about \$100 to \$250.

There's also a third dedicated photo printer technology recently announced by ZINK Imaging. ZINK is short for zero ink. The technology embeds clear, heat-sensitive dye crystals in its photo paper and uses heat to activate the color. The first

ZINK printer, the Polaroid PoGo Instant Mobile Printer, should be available by the time you read this—look for my review of it on PCMag.com.

At this writing, it's not clear how good the photo quality will be for the first generation of ZINK printers, but their big selling point is portability and instant gratification for printing photos wherever you happen to be. The preproduction versions we've seen literally fit into a pocket and can print wallet-size (2-by-3-inch) photos from, for example, your cell phone.

Near-dedicated photo printers aren't as clearly defined as the dedicated variety, but they're also easy to spot. Priced at \$400

													PHOTO APPLICATIONS: HIGH-QUALITY SETTINGS (MIN:SEC)	
MICROSOFT EXCEL 2003					MICROSOFT POWER- POINT 2003	MICROSOFT WORD 2003					ADOBE PHOTOSHOP 7.0			
1 page table with grid	1 page table without grid	1 page table with background tints	1 page graph	3 pages charts and graphs	4 full-page slides	2 pages text	2 pages text and clip art	2 pages text and photos	12 pages mono-chrome text	12 pages color text	TOTAL OUTPUT TIME (MIN:SEC)	Average time per print: 4 x 6 prints	Average time per print: 8 x 10 prints	
0:26	0:27	0:33	0:33	1:25	2:21	0:51	0:52	0:50	4:18	4:21	21:51	4:07	9:23	
0:12	0:12	0:25	0:24	1:16	1:40	0:19	0:28	0:26	1:26	2:33	12:12	0:52	1:44	
0:13	0:13	0:31	0:29	1:38	2:32	0:20	0:30	0:31	1:27	3:19	15:58	0:58	2:01	
0:14	0:14	0:27	0:26	1:20	1:42	0:20	0:29	0:27	1:28	2:34	12:34	0:54	1:45	
0:15	0:14	0:50	0:49	2:26	4:17	0:25	0:48	0:48	2:12	5:55	26:37	2:06	4:31	
0:19	0:18	0:24	0:24	1:00	1:27	0:37	0:37	0:34	3:17	3:21	15:20	2:41	6:11	
0:19	0:13	0:40	0:39	1:39	2:40	0:26	0:40	0:41	2:16	3:53	19:02	2:45	6:13	
0:15	0:15	0:21	0:22	0:41	1:02	0:20	0:26	0:25	1:10	1:15	8:49	2:25	5:22	
0:13	0:13	0:19	0:20	0:43	1:03	0:18	0:24	0:24	1:11	1:15	8:41	2:27	5:20	
0:25	0:19	0:33	0:33	1:14	1:58	0:31	0:41	0:40	3:06	2:29	16:15	1:09	2:48	
0:24	0:23	0:40	0:40	1:31	2:19	0:50	1:02	0:59	2:34	4:36	21:03	1:07	2:12	
0:15	0:14	0:42	0:44	1:54	3:27	0:20	0:43	0:41	1:41	4:56	22:07	2:08	4:33	
0:16	0:14	0:17	0:19	0:46	0:34	0:15	0:17	0:16	1:19	1:21	6:59	0:12	0:21	
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0:47	N/A	
0:29	0:27	0:35	1:52	2:03	5:35	0:50	0:55	0:53	3:52	3:50	25:58	1:06	2:05	
1:04	1:01	1:21	1:20	3:04	4:24	2:03	2:04	1:59	10:06	10:32	47:49	3:32	6:44	
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1:19	N/A	
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0:42	N/A	
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0:42	N/A	
0:25	0:25	0:34	0:33	1:23	2:05	0:52	0:52	0:50	5:07	5:14	22:27	2:03	4:29	
0:33	0:31	0:40	0:40	1:41	2:25	1:05	1:06	1:04	6:22	6:11	27:08	0:56	1:43	
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1:28	N/A	
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1:27	N/A	
0:23	0:23	0:30	0:30	1:09	1:36	0:37	0:46	0:43	2:48	2:58	15:30	2:13	3:51	

and up, they're aimed at both professional photographers and serious amateurs who want to print photos on standard paper as large as 13 by 19 inches, and in some cases at larger, banner sizes. Most of these "prosumer" models also do a great job with graphics on high-quality paper, so they are good choices for graphic artists as well.

Because these printers are inkjets, they can print on plain paper, which means you could use them for all-purpose printing if you wanted to. But that would be like using a scalpel as a butter knife. Not only would you be wasting the scalpel's finely honed edge, but a butter knife can do a better job with butter. In the case of near-dedicated

photo printers, the inks are designed to work best with high-quality paper. In many cases they'll give disappointing results on plain paper, with dulled-down colors.

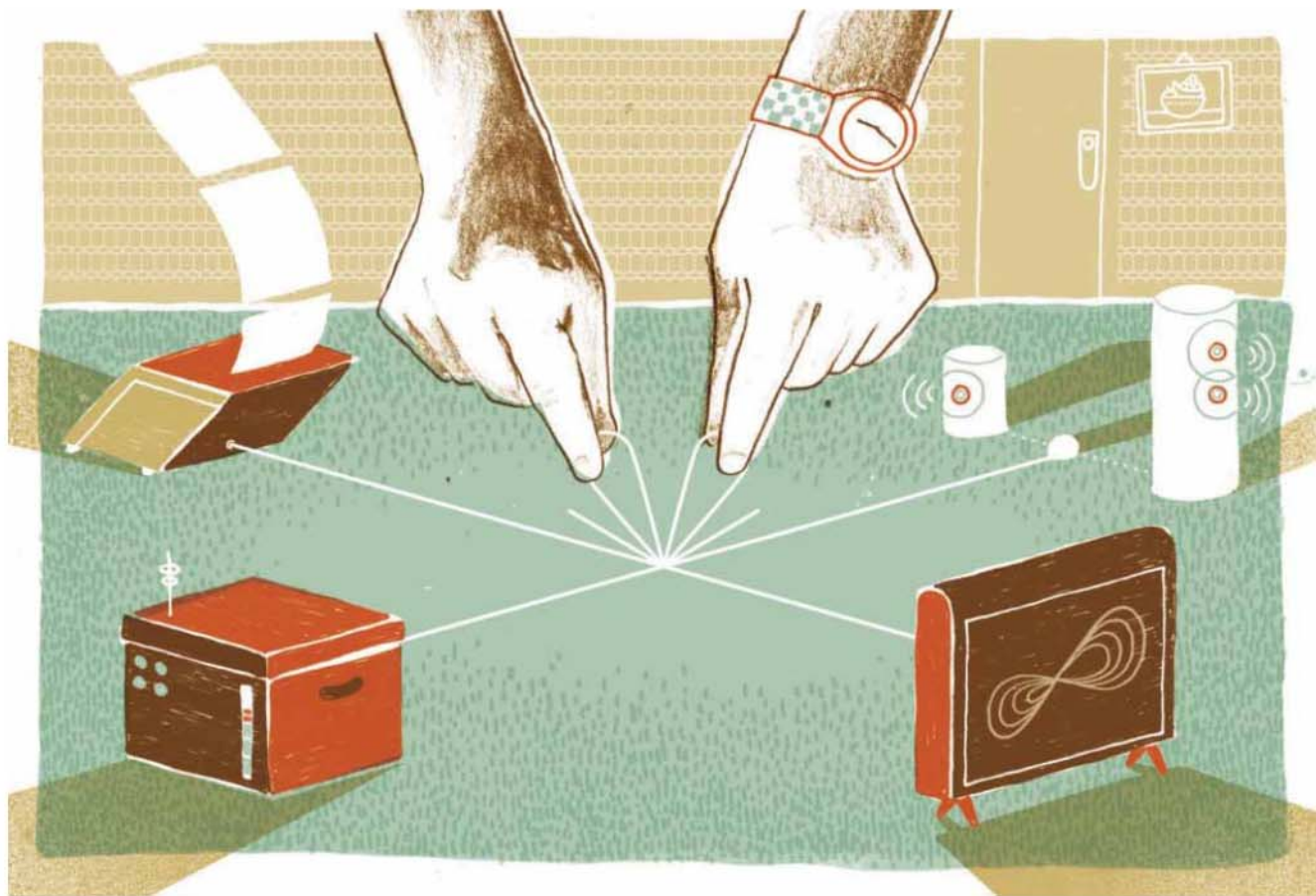
Most inkjets today, but particularly near-dedicated photo printers, offer long-lived photos that will last far beyond the life of traditional silver halide prints. For longest life, look for printers that use pigment-based inks, which tend to survive longer than dye-based inks.

Most, if not all, of these printers use more than the traditional four ink colors (cyan, yellow, magenta, and black), with some using as many as ten. The additional

colors, or in some cases shades of gray, give the printers a wider color gamut and make it easier to print subtle gradations in skin tones, the sky, and other real-world images.

The inks are also designed to work well with a range of papers. In particular, the printer manufacturers all sell their own assortment of fine art papers that you can choose from to enhance the image. Expect photo quality from these printers that's nothing short of superb.

MORE ON THE WEB For advice on how to buy mono and color lasers, check out go.pcmag.com/printguide.



Build Tomorrow's Network Today

Enter a new age of digital entertainment—and avoid unnecessary upgrades and hassles—by future-proofing your home network with the fastest high-end technology available. *By Eric Griffith; reviews by Oliver Rist*

It's time to stop asking why anyone would want a home network. The convenience of accessing the Internet, printers, and network storage from any computer—even bringing the living-room entertainment center into the mix—is self-evident.

In our latest reader survey, 88 percent said they have two or more computers at home. Factor in printers, game consoles, even some phones, and practically everyone has multiple items to network. What are you waiting for? Take the networking plunge—you can learn the basics from our

“Home Networking 101” story (go.pcmag.com/homenetworking101).

Read that, then come back here where we will spell out for you the three fastest technologies available for home networks today: Gigabit Ethernet, 802.11n, and fiber to the premises—technologies that will give you the highest-end connectivity on your block.

Wired: Gigabit Your Cabling

Wireless Wi-Fi gets all the love and credit for the home-networking phenomenon of

the last decade. And for good reason—not having to punch holes in walls for cables is *awesome*. But to truly get the best connectivity for your money, we recommend you go with wired Ethernet. The vast majority of products with Wi-Fi even offer an Ethernet port as an option. You can find out plenty about how and where to run Ethernet in your house on page 70.

Gigabit Ethernet (which is also called 1000Base-T, but we'll call it GigE) is the fastest cabling available for in-home networking equipment today. It provides a

hundredfold increase over the elderly 10Base-T (running 10 megabits per second) and 10 times the Fast Ethernet (100Base-T at 100 Mbps) that's ubiquitous today. Some businesses are already using 10 Gigabit Ethernet (10-GigE), but that won't arrive in consumer products anytime soon.

You'll pay a price differential for home-networking products using GigE rather than Fast Ethernet. It's not ten times the cost for ten times the speed, but the extra expense accounts for why networking companies like Linksys and D-Link continue to offer routers and switches with Fast Ethernet at lower prices. For example, Linksys offers two almost identical 802.11n-based Wi-Fi routers (WRT160N and WRT310N), but the latter, the one with GigE, costs about \$40 more. With four Ethernet ports on each, that's an extra \$10 per port. Linksys says the Fast Ethernet version is for customers whose computers don't support GigE and aren't prepared to invest in an upgrade.

That's no excuse for you. A GigE network adapter for a desktop PC is available for less than \$30 from Belkin or Linksys, to name just two brands. Belkin even sells a GigE adapter to plug into a USB port for \$44.99. A standalone four- or five-port GigE switch costs as little as \$36 on Amazon.

If you're going to use 802.11n, pick a router that also has a GigE switch for the wired side. With 11n real-world speed reaching 230 Mbps, traffic would get bottlenecked in a Fast Ethernet connection of less than 100 Mbps. (Real-world speeds are never as fast as speed claims that manufacturers make, on account of factors like network overhead.)

You also need to consider the types of Ethernet cables required to support GigE. The lowest end, Category 5, is used all the time for Fast Ethernet and is supposedly rated for GigE, but Cat 5 was superseded by Cat 5e for better performance. (The e is for enhanced.) Cat 5e and the more expensive Cat 6 are recommended for GigE.

You can purchase Ethernet cables of varying lengths and with varying amounts of shielding, either cable alone or with finished plugs (called a patch cord). Or you can buy thousands of feet of cable in a box. You'll need to attach the plugs on the end yourself, keeping in mind that you shouldn't create a cable longer than 328 feet (100 meters) to get full performance. Crimping heads on the eight copper wires inside the cable is somewhat difficult for

the uninitiated, requiring some special tools and knowledge of what wires go to what pin.

Several videos on YouTube illustrate the process. Sites that specialize in cables sell all the tools and include guides; Cables To Go, for instance, sells 1,000 feet of Cat 5e for \$319.99, and of Cat 6 for \$449.99. The latest Ethernet cable, Category 6a, is \$499.99 for 1,000 feet there. String Cat 6a through your house to truly future-proof your network, as it's suitable for 10-Gigabit Ethernet.

Wireless: 11n Brings the Speed

802.11, the IEEE specification referred to as *Wi-Fi*, is well into its latest version, known as 802.11n. The key to the success of any new flavor of Wi-Fi is to achieve backward compatibility while also improving on range and/or data rate, and 11n does all of that. It's the only way to go to get a next-gen Wi-Fi network today.

The 11n iteration has major advances over previous versions of 802.11. First, it uses multiple-input multiple-output (MIMO) technology, which places several smart antennas on each end of a connection to send and receive signals simultaneously. It also has an optional 40-MHz double-wide channel mode to double the data sent and received. Since using that with older networks can cause interference, the Wi-Fi Alliance, which tests products for interoperability, doesn't require it. No products ship with these 40-MHz channels turned on. Using the standard 20-MHz channel width means that your network remains a "good neighbor" with other networks in the neighborhood. In fact, 11n will drop back to a 20-MHz channel automatically if another network using a 20-MHz channel is detected nearby. If your network is far enough away from those of your neighbors, however, try the 40-MHz option to see how it pushes performance.

All this new technology means a lot more data in the air at once, boosting the 11n data rate to 300 Mbps. In fact, 802.11n claims a top data rate of 600 Mbps, though you'll never see this outside of a laboratory: Real-world throughput is going to top out at around 200 Mbps. No one offers an 11n product with the 4x4 antenna configuration (four antennas on each end of the link) that optimum throughput would require, anyway.

11n maintains compatibility with older Wi-Fi devices by supporting two radio fre-

Acronym Buster

What's the WPA in your Wi-Fi? Learn the alphabet soup of network terms and abbreviations.

802.11n The latest, greatest Wi-Fi. It can run in the 2.4- or 5-GHz bands and uses MIMO (see below) to get better speed and range. It has yet to be fully ratified by IEEE but is close enough for products vendors. Backward compatibility with 11b/g/a depends on radio bands used.

Dual-band A router/access point feature that supports both the 2.4- and the 5-GHz radio bands, sometimes simultaneously, sometimes one at a time.

IEEE The Institute of Electrical and Electronics Engineers. These are the gearheads who create and update networking standards like 802.11.

Mbps Megabits per second, a typical data rating used in broadband and networks. Sometimes written as Mbits/s. 1 Mbps is equal to 0.125 MBps (megabytes per second; 8 bits = 1 byte).

MIMO Pronounced *mee-moh*, short for multiple input multiple output, uses multiple smart antennas to improve wireless network throughput and range.

Wi-Fi Rhymes with "hi-fi" (but is *not* short for "wireless fidelity"); the brand name for wireless networks running IEEE 802.11 standards. A Wi-Fi Certified logo from the Wi-Fi Alliance indicates a product independently tested for interoperability with other Wi-Fi products.

WPA Wi-Fi Protected Access. Replaced Wired Equivalent Privacy (WEP) to provide better authentication and encryption on a wireless connection. Created by the Wi-Fi Alliance, which requires WPA support for certification.

WPA2 Wi-Fi Protected Access version 2. Upgrades the original WPA to support the 802.11i security protocol fully, and uses AES-based encryption, which requires a special encryption chip. Even today, many devices lack WPA2, including the Xbox 360 Wi-Fi adapter and the Sony PlayStation Portable.

For more acronyms explained and detailed looks at network storage, home servers, and automation, visit go.pcmag.com/tomorrowsnetwork.

DUAL-BAND ROUTERS



D-Link Xtreme N Duo Media Router

\$359 list



PC MAGAZINE EDITORS' CHOICE
The D-Link Xtreme N Duo Media Router (model DIR-855) has it all: advanced features, great throughput speeds, and even funky looks you can customize with optional gel skins. It supports both the 2.4- and the 5-GHz bands simultaneously, putting wireless-n clients in the uncrowded 5-GHz spectrum, while legacy wireless-g clients stay in 2.4-GHz to prevent interference.

For more: go.pcmag.com/dlinkdir855



Linksys Dual-Band Wireless-N Gigabit Router

\$199.99 list



Our previous wireless-n Editors' Choice, the Linksys (WRT600N) rivals the D-Link DIR-855 in everything save performance and quality of service features. Its throughput numbers were slightly slower than the DIR-855, which also provides more options for protecting traffic, especially streaming media. Then again, it has been several months since our review; Linksys has had time to make some changes.

For more: go.pcmag.com/linksyswrt600n



Netgear RangeMax Dual Band Wireless-N Router

\$129.99 list



This Netgear router (WN-DR3300) is one of our first low-cost dual-band entries. It can broadcast in either the 2.4-GHz or 5-GHz radio frequencies. While it drops some higher-end management features found on other routers, Netgear has supplied quality of service for voice and audio traffic, as well as solid security. A bigger problem is test performance, which was a little disappointing in both bands.

For more: go.pcmag.com/netgearwndr3300



SMC Barricade N ProMax Wireless Broadband Router

\$160 street



The Barricade N (SMCWGBR14-N) has as many features as the Editors' Choice D-Link, with one important exception: It broadcasts only in the 2.4-GHz band. That means 802.11g and 11n clients are likely to clash, hurting throughput. This was borne out by slightly disappointing numbers in performance testing, though the router did extremely well on range. The Barricade N is fine for basic network tasks.

For more: go.pcmag.com/smcwgb14n

quencies, 2.4-GHz (used by the older 11b and current 11g) and 5-GHz (used by the rare 11a). Both radio bands are unlicensed by the FCC and have their ups and downs: 2.4 can go farther and penetrate walls better, but everyone uses it—from cordless phones to Bluetooth headsets and beyond—so there's more interference. 5-GHz can't go as far, but it has many more channels to choose from within the allowed frequency band, so there's much less interference.

Dual-band 11n products support both 2.4-GHz and 5-GHz use. If your router can run both at once, you can segment your network. For example, one segment could support laptops using 2.4-GHz for Internet connectivity, and another could support your home entertainment system on 5-GHz. The Linksys Wireless-N WRT600N router offers this dual-band feature. The next step down is *selectable dual-band*, which uses only one at a time; Apple's Airport Extreme Base Station is a perfect example.

Dual-band routers typically have Gigabit Ethernet ports integrated for the wired side. You want to have that so the wired can keep up with the wireless instead of the other way around, as in the past. Bottom line: Simultaneous dual-band and GigE together in one router is the best network technology you can buy today.

Plenty of 11n routers support only the 2.4-GHz channel, as that's enough to make

them compatible with the vast majority of existing Wi-Fi devices using 11b/g. These single-band 11n routers may come with Fast Ethernet rather than GigE to save a few bucks.

Is that all there is to Wi-Fi? You may also want to watch for the arrival of *mesh networking*. A mesh network utilizes each node, including routers and PCs, to extend the network, creating a virtual spiderweb of interconnectivity in a house. Municipal and corporate Wi-Fi networks are already using mesh technology. Right now, all mesh products use proprietary technology—check out Meraki (www.meraki.com) for a worthy example—but an official wireless mesh specification called 802.11s is also in the works. At least one company, PacketHop, says it has software that could implement 11s in networking products today, though it doesn't yet have any customers. The Wi-Fi Alliance has a mesh task group looking at 11s and what it will mean for future products.

The IEEE has *still* not ratified the 11n specification. It's in what the engineers call "draft mode," and has been for two years. Essentially, it's done, and the 11n task group just needs to sign off on it. But final ratification will probably not happen until—we kid you not—July 2009. (Last year at this time, that date was slated to be September 2008). Wi-Fi product vendors, and even

the Wi-Fi Alliance, don't care that the spec isn't ratified. It's "done enough," and the tech specs probably won't change much with ratification. Upgrades of the draft-n products to the final 11n standard shouldn't be an issue.

To date, the Wi-Fi Alliance has certified 273 draft-n products as compatible with other Wi-Fi products. That includes some unique devices, many for communications and home entertainment, that support the Wi-Fi Multimedia (WMM) enhancement to quality of service for voice, audio, and video. HP's new MediaSmart 1080p LCD HDTV, which is a media extender in itself, is a good example. Several media extenders and network bridges are now available to bring Wi-Fi to your entertainment center. The Wi-Fi Alliance is also finishing up a Voice Personal program to test Wi-Fi phones for consumers. It has already certified 150 phone handsets to date.

Almost all of these devices for video and voice continue to use 11g and Fast Ethernet just to keep the price down (Apple TV being an exception in using 11n—but not GigE).

Internet: Fiber to Your Premises

All the speed in the world on your internal home network won't make Internet downloads and Web pages load faster if your ISP provides a slow connection. Hopefully, you've got either DSL (digital

NETWORK MANAGERS



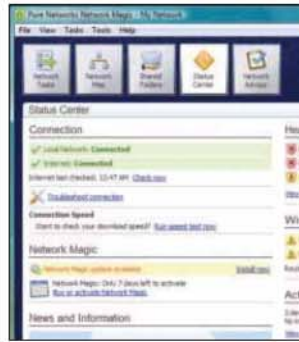
Linksys EasyLink Advisor

Free with Linksys hardware



Similar in form and function to Network Magic, the Linksys EasyLink Advisor (LELA) is resident only on Linksys routers and available only if you run the installed setup CD and submit to a somewhat invasive download process. Not as easy to use as Network Magic, but as a freebie to Linksys router buyers, it is a plus.

For more: go.pcmag.com/lela



Network Magic

Essential version, \$29.99 for three PCs; Pro version, \$49.99 for eight PCs



Network Magic has made ease of use and network accessibility its primary goals, and it succeeds admirably. Though that simplicity can at times be frustrating, for most home users and network newbies this software helps ease both setup and troubleshooting.

For more: go.pcmag.com/networkmagic

subscriber line) from your phone provider or a cable modem from your television provider. For a select few, though, there is something better: Fiber to the premises (FTTP, also called *fiber to the home*) is a fiber-optic cable brought right up to your home and connected to the router, providing the fastest Internet speed available in the U.S. today. The data pipe is big enough that FTTP is seldom sold just for Internet service. It's typically available in packages with phone and television—that's VoIP and IPTV—as well. There's also what's called *fiber to the node* (or *neighborhood*) and *fiber to the curb* (FTTC). With FTTN, fiber-optic cable is brought to an area nearby and branched out to homes as requested via copper lines, much like DSL. It's slower than FTTP.

Currently, only two companies offer FTTP in the U.S. **Verizon FiOS** (www.verizonfios.com), while not everywhere, is true FTTP and garners attention each year in our annual reader survey. Two years running it has been a Readers' Choice, with high scores all around, but especially for speed, of course. FiOS starts at \$49.99 per month for a 5-Mbps connection (2-Mbps for uploads) and scales up from there, all the way to a 30-Mbps download pipe for \$139.95 per month.

AT&T U-verse (uverse.att.com) is sold primarily as an IPTV service, with Internet thrown in; you can't buy Internet separately. The base speed is a lowly 1.5 Mbps for an extra \$25 per month; the max is 10 Mbps for \$55 per month, which isn't much different from cable. These speeds are in general

lower than FiOS's because U-verse is an FTTN technology in the majority of the 43 markets where it exists, though some new construction can get it as FTTP.

Verizon or AT&T will provide a gateway (a router) to handle the connection from the fiber to your home network. It's not necessarily going to be as high-end as you may want for an ultramodern home network. For instance, don't count on the gateway even having GigE ports. If that's the case, you can connect a wired GigE switch and a separate 802.11n access point to get the highest speeds on your internal network. Even with slower ports on the gateway at 100 Mbps, they'll still be faster than the highest download speed you can get from the FTTP connection, so it's not much of a bottleneck. At least for now. □

Add Movies and Music to Your Network with a Media Extender

A media extender lets you stream music, movies, and photos from your computer or from the Internet to your home theater. The newly arrived second-generation products are much easier to set up and are designed with style in mind.

AppleTV, starting at \$229 (direct), is my favorite extender, thanks to its large selection of movie rentals. But if you're not an iTunes user, it's not for you. **Archos's TV+** (\$250 street for the 80GB version) offers streaming as well as an excellent digital video recorder (DVR). It gives you access to the media on your computer as well as records your favorite TV shows. **MediaGate's \$200 (street) MG-350HD** is a nightmare to set up, but it works. The new MG-450HD offers only modest improvement.

You can also choose from several Windows Media Center (WMC) extenders by D-Link, Linksys, and Samsung, to name a few. If you have WMC on your PC, then you're familiar with the user interface on these systems—they're identical. What's more, all these products work in exactly the same way, streaming content organized by WMC on your computer. Some come with options like a DVD tray or additional connectivity. The Xbox 360 also has WMC streaming capabilities.



If you're interested in music-only extenders, there's the high-end **Sonos** system: \$999 (direct) gets you a minimal setup. The Sonos remote is awesome, and iTunes, Napster, Pandora, and Rhapsody support is built in. **Logitech's Squeezebox Duet** also sends your music wirelessly throughout the home (though its remote is annoyingly slow). It incorporates music from your PC along with Rhapsody and Slacker accounts—for a price of \$399.99 (direct).

Then there are the video-only extenders. The best of these glean their content from the Internet. **VUDU** is a set-top box that, for \$295 (direct), offers SD and HD streams of thousands of titles on demand, but it won't stream content from your computer. The **Netflix Player from Roku** is a snap to set up and works with the "instant" offerings on Netflix's site. The movie selection is limited, but at \$99.99 (direct from Roku), this is a steal. You still get your discs sent to your home via snail mail, but while you wait you can watch a movie on demand. Unlike most extenders, the Netflix Player doesn't have a hard drive, so it works only by streaming from the Internet.—*Tim Gideon*

Wiring Your Home with Cat 5e

Seems like everything has wireless capability these days—your laptop, printer, PDA, and even your DVR. This is all very convenient, but don't sound the death knell for good old-fashioned Ethernet cable just yet. If you're building a home network, a portion of it should definitely remain wired.

At home you're watching videos, downloading movies, and even getting on-demand entertainment via the Internet. Despite Wi-Fi's ever-increasing bandwidth, it's a finite resource shared by all your equipment and by all of your neighbors, too. If you can see your neighbors' wireless routers, you're sharing bandwidth. If enough of you are downloading at the same time, you're contending for air time and interleaving packets.

Equipment that doesn't move around, such as a networked printer, should be hardwired. Hardware that carries big data loads—the aforementioned DVR, your home entertainment server, your backup server—should likewise be hardwired. And if you always use your laptop in the same spot, why not run a cable to it? You may actually see a performance improvement when you're online, especially as Web sites become denser and more content filled.

For this job you have three cables to choose from: Cat 5, Cat 5e, or Cat 6 cable. If you want to future-proof the network, go with Cat 6. We chose Cat 5e, which is far less expensive and can handle gigabit speeds if need be.—*Bill Machrone*

Getting Started



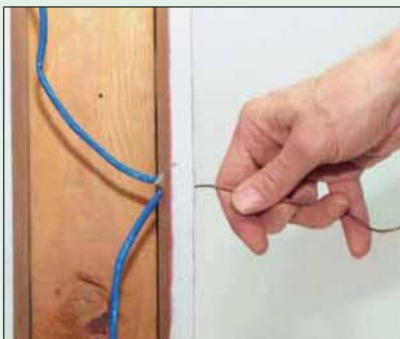
1 We built a model wall to show you what you're dealing with. Our model wall rests on a subfloor. The bottom 2x4 is the plate, and the vertical 2x4s are the studs. Gypsum wallboard is screwed or nailed to the studs. Flooring (right side only) starts from the wall, but some interior walls have flooring under them. The baseboard and optional shoe molding go on top of the flooring.



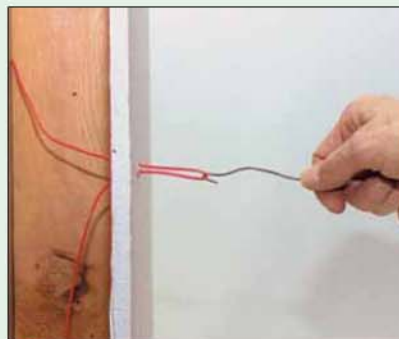
2 If you have a basement, drilling* from underneath is the easiest way to go. You can generally find the interior of a wall by looking for other holes, such as those for wires leading to outlets and switches, or for TV, phone, or cable modem lines.



3 If you're coming down from the attic, tie a nut to a strong string and drill through the top plate. There won't be a subfloor to drill through, but the top plate is often doubled. Be careful to drill between the studs. Mark one-foot divisions on the string so that you know how far you've gone into the wall. Tape your cables to the string and use a hooked piece of stiff wire to snag the string and pull it all through.



4 When you're working from below, you may find that the Cat 5 cable is too stiff to go through the hole. If you're installing a junction box and a wall plate, this won't be a problem because you'll be working through a larger hole.



5 If you make your initial pull with 20- or 22-gauge solid-core wire, you'll be able to guide it through the hole easily. This entire process can also be done with a professional fishing tool, but we're betting that not many of you have one.

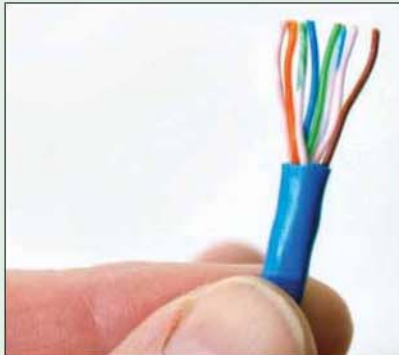


6 Make a running splice by wrapping the thin wire around your cable. Cover it with electrical tape so it won't snag on the holes and use the thin wire to pull the cable up. When working from the attic, use the same technique but attach the string to the cable instead of the thin wire.

Crimping and Terminating



1 Once you've run the cable, strip off about half an inch of the outer insulation, taking care not to damage the twisted pairs within.



2 Arrange the individual wires in the proper order: orange-white, orange, green-white, green, blue, blue-white, brown-white, brown. You may not be able to see the color codes on some of the white wires, so note which wire the white wire was wrapped together with. You can always strip more insulation to see the color coding, if necessary.



3 Use a modular connector crimper/trimmer to trim the ends to the right length.



4 Insert the wires such that each follows its internal channel all the way up, under the metal fingers of the Ethernet jack.



5 Crimp the plug to lock it in place. It's ready to plug into your computing equipment.



6 You can also mount jack plates on the wall for a polished, professional look. This Radio Shack plate has a female-female adapter built in, so you can just plug your cable into the back and plug your computing equipment into the front.



OUT OF SIGHT I ran this conduit along the corner of my closet, thus avoiding my Western wear.

Getting from Floor to Floor

If you need to get a wire from the basement to the second floor, or from the first floor to the attic for an up-and-over wiring job, closets are your secret weapon. Look for closets that are stacked on top of one another. A hall closet on the first floor may align with a bedroom closet. No one will object to a length of Cat 5 running from floor to ceiling in the corner of a closet, but if you want to do it right, drill a larger hole and install a plastic conduit.

A conduit is ideal for running multiple wires and simplifies adding more cables later. One-inch PVC will do. Working with several short pieces is best: one up into the ceiling, one down into the floor, with a coupler in the middle. You may want to leave a length of string in the conduit to make pulling additional cable through in the future easier.

You can also do what telephone installers have done for decades—go outside and up an exterior wall. Once the cabling is neatly run and there's house paint on it, you'll never see it. Don't attempt to go inside an exterior wall if you don't have experience doing so. The insulation makes it next to impossible.

If you have forced-air heating or air conditioning, you can run inside the plenums, but you need to use plenum-rated cable. Check local building codes and ask your fire insurance carrier before opening any plenums. Plenum runs can be difficult: Stick to larger, straight runs. Also, plenum-rated cable is significantly more expensive, so if you can avoid the plenums it might pay to do so.

***CAUTION!** If you've never done this kind of work before, get help from a knowledgeable friend or a professional. You don't want to drill into electrical wires, water pipes, air-conditioning lines, or anything else that may be concealed behind the gypsum board. Survey the area carefully first.

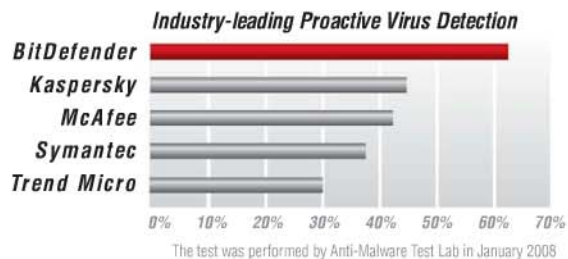
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Solutions

PROBLEMS SOLVED THIS ISSUE

- | | | |
|--|--|----------------------------------|
| 76 Move files to a new hard drive | 78 Using drive images to manage multiple PCs | 83 Use emoticons to search mail |
| 76 The right CPU for a Photoshop user's new PC | 82 Making Macros | 83 Improve phone battery life |
| 80 Marketing via podcast | 83 Diagnose network drag | 83 Bring back the slideshow view |

Beyond Red-Eye

Intermediate photo-editing tips and techniques. *By David Cardinal*



WASHOUT FIXED

Use Photoshop's simple Levels adjustment layer along with a Hue/Saturation layer to add more vivid color—but not too much—to a washed-out subject.

So: You've figured out how to get images from your camera into Photoshop and played with some of the Automatic tools. Now you're probably wondering what to do next. The possibilities are nearly unlimited, but in this article we've picked out a few of the most useful techniques that advanced users and pros harness to improve their images. Users of Photoshop Elements won't have access to quite

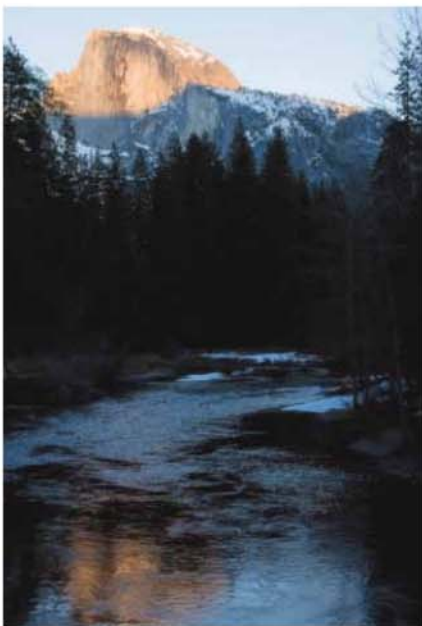
the same range of tools, but good news: In many cases, there are effective ways to achieve similar effects.

Fixing Backlighting

A common problem for all photographers is a poorly lit subject in a bright scene. If you can use your flash when you take the photograph that's the best solution; but even if you're stuck with an image that is

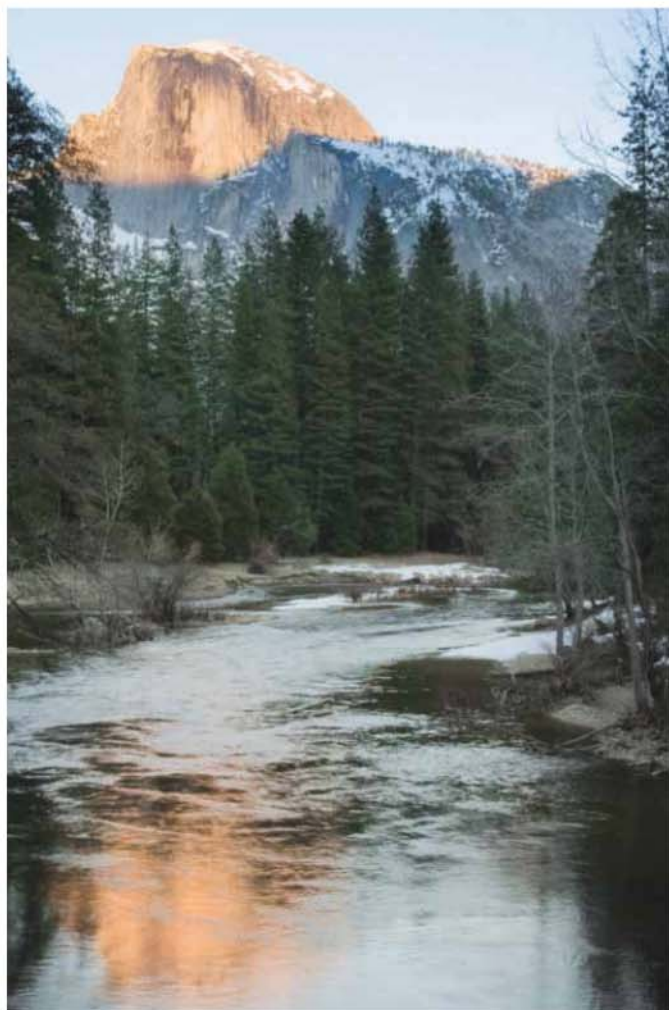
already captured you can use your photo editor to help out.

In the case of Photoshop, a *Curves Adjustment layer* is the most powerful and flexible tool you can use to deal with the problem. Photoshop Elements doesn't have Curves Adjustments, but you can use a Levels Adjustment layer to do almost the same thing. In the image (above left) of a rare Namibian desert elephant, the



TWO IMPERFECT SHOTS

Take two identical shots with different settings and you'll be able to grab the best of each.



bright sunny background overwhelmed the elephant itself. So I added a Levels Adjustment layer in Elements and simply moved the midpoint of the Levels adjustment to the left to brighten the image's overall tone. Then I clicked on the mask icon in the Layers palette and used a soft black brush to "paint out" the background so that it wouldn't be affected—painting black on a mask hides the effect of the layer while painting white shows the effect. The result is a much brighter subject with the same background—a much more effective photograph.

There is a one-click version of this adjustment available in recent versions of Photoshop you can use—the Shadow/Highlight command. It works directly on your top layer, so be sure to make a layer copy before using it so you'll have your original to return to if needed. It also is best used for small adjustments; with a large subject, like the elephant, it may look unnatural.

Fighting Uneven Lighting

Your camera can't capture the same range of light to dark that your eye can see. So if you have a partially lit scene, like the accompanying one of Half Dome reflected in the Merced River in Yosemite National Park, you simply can't make the entire image look good in a single image capture. The trick is to capture two images—use a tripod—one with the settings adjusted so the mountain looks good, and the other with the settings optimized for the river. It is then a simple matter to open both images in Photoshop and drag the Layer icon from one to the other (holding down the Shift key so that they are correctly aligned), thus creating a document with two layers. You can then either Erase the portions of the top layer you don't want or create a mask for it (see the next section) that you can Paint and Erase until you get the blend of the two images that's what you want.

Photoshop Elements Technique: Creating Layer Masks

For techniques like combining two images, using a mask to Paint and Erase layers is far preferable—you can always change what you've done. Unfortunately Photoshop Elements does not offer the Photoshop *Add Layer Mask* command, but there is a quick workaround. Simply create an adjustment layer with all the controls left at the defaults and drag it below the layer you



MULTIPLY Low light levels washed out this entire photo. Duplicating the layer and applying the Multiply blend made the cub and the background more visible and detailed.

wish to mask. Then press Ctrl-G to group the adjustment layer with your layer; the mask on the adjustment layer will operate on your layer. This is the most important method we know of for using Elements the way pros use the full Photoshop.

Using Multiply to Add Detail

Many images contain areas that look washed out or lack detail. You can labor over custom curves to fix the problem, but often there is a much quicker way: using a duplicate layer and the Multiply Blend mode. Have a look at the image (above) of a lion cub looking up at us, which I took during a recent photo safari to Botswana. The facial expression is priceless, but because of the low light levels there is little contrast in the image and it appears somewhat washed out. Fortunately it's an easy problem to fix using a Multiply layer.

First, duplicate the Background layer by dragging it to the *New Layer* icon in the Layers palette. Then set the Blend mode of the new layer to Multiply. Like magic, both the lion cub and the grass become much more visible and detailed. For even more control use a Layer mask on your new layer to limit its effect to just the portions of the image you want to modify. □

PHOTO EDITING QUICK TIPS

USE LAYERS Whenever possible, don't make your adjustments directly on your image. Make a copy of the image on a new layer and adjust the copy instead. That way you always have your original safely stored. And then you can use a layer mask so that you don't even need an entire extra layer to control the effect of your changes.

SELECTIVE SHARPENING Sharpen your subject, especially the hands and eyes of a person or animal, to help draw it out from the background. You can go even further by deliberately blurring the background for additional effect.

HUE/SATURATION LAYER Hue/Saturation adjustment is a quick and simple way to add a little bit of "pop" to the colors in an image. It's easy to overuse, so be careful, but adding a Hue/Saturation Adjustment layer and moving the Saturation slider a little to the right can often bring life to washed-out images. Another related pro photographers' trick: Try increasing the saturation of the subject only. The viewer will be drawn to the vivid subject and it will appear to stand out even more from the relatively dull background. Remember to use a Layer mask.

ADVANCED TIP: REUSE MASKS You can use the same Adjustment layer mask for multiple tweaks in Photoshop Elements, which lacks the masking commands that the full version of Photoshop has to do this directly. Just duplicate your Adjustment layer (using the pop-up menu on your layer) instead of creating a new Adjustment layer, and then use the *Layer | Layer Content Options* command on your new layer to change it to the effect you desire. Then you'll have a new layer with your desired mask.

In the case of our elephant example we'd duplicate our Levels Adjustment layer (either by choosing the layer, right-clicking, and selecting *Duplicate Layer* from the context menu, or by dragging it to the new layer icon) and then using the *Layer | Layer Content Options* command to change our new layer to a Hue/Saturation layer. Then all we need to do is drag the Saturation slider a little bit to the right and we're done!

Ask the Experts

Free Up Some Disk Space

Q I bought a Dell 4400 a few years back. It had only a 20GB hard drive, so I added an 80GB drive. Now the CPU usage is always near 100 percent, and the free space on the C: drive is less than 7 percent. How do I move the files and programs to the 80GB drive to give me more room on my C: drive? I'm not an expert user.—Robert Del Bianco

A A number of simple techniques will get you more space on your C: drive. First let's do some spring-cleaning. In Windows Explorer, right-click the C: drive and choose *Properties*. Click the *Disk Cleanup* button and wait for it to report what it can do for you. This scans the drive to see what could be gained by compressing older files, a process that can take a while. When it's done you'll get a report on various types of files that can be deleted as well as the space to be gained by compressing old files. If you haven't done this before, the saving can be significant.

Now let's get your documents and other data files off the space-challenged C: drive. Right-click *My Documents* on the desktop and choose *Properties*. Click the *Target* tab. Assuming D: is the letter for the 80GB drive, change C: to D: in the *Target location* box. Click the *Move* button to move your data files to the larger drive.

Moving your programs from C: to D: is a little tougher, which is why I presented the other two options first. The only completely safe way to move an installed program is to uninstall it from its current location and reinstall it on the larger drive. Pick a program for which you have the original installation discs and any registration or license code that may be needed. Launch *Add and Remove Programs* from Control Panel, find the program in the list, and remove it. If it offers to retain your settings, agree. When you're done, install it again from the original discs, but instead of accepting the default location (typically a folder below C:\Program Files), change C: to D:.—Neil J. Rubenking



NO SPACE Windows' built-in Disk Cleanup tool can save your bacon if your boot drive gets too full.

Starting with the CPU

Q I need to buy a new PC and would like some recommendations on features and specifications I should look for. I'm a photographer and use Photoshop CS2 software. I've already bought a Samsung 25.5-inch monitor and have three external hard drives. Since I'll probably use this PC for at least five years, I want one that will be adequate for my purposes for at least that length of time, but I also need to keep the price well under \$2,000—about \$1,200, if possible. Any advice?—Scotti Ruhlman

A I use Photoshop quite a bit (both CS3 and Lightroom), so I definitely know where you're coming from. Many key Photoshop filters are multithreaded, so it is worth moving to a quad-core CPU. That simply means four CPU cores, which you can get in a system that will meet your price point.

A system based on an Intel Q9450 should perform very well on most of the chores involved in photography. If you're more budget minded, consider the Q9300, which costs about \$80 less than a Q9450.—Lloyd Case

Vista's Virtual Store

Q What is the purpose of the Virtual Store? Using either the uninstall program that came with some software or using Windows uninstall, I have removed Kodak printer, Legacy Genealogy, and Registry Cleaner software in the past two to three weeks. But all the software is still in Virtual Store after uninstalling. I have manually deleted it but wondered why uninstalling did not remove it.—Joe Brown

A For security, Vista forbids programs from writing to a variety of "sensitive" areas, among them the Windows folder and the Program Files folder. That includes all subfolders of Program Files, so this ban would be a hardship on older programs that store INI files or data files along with the program itself. To avoid disabling these programs, Windows Vista lies to them. When they try to write to a banned location, it says "Sure, no problem!" but actually saves the data in a holding area called the Virtual Store. And when the program tries to read back the data it wrote, Vista slips in the data from the Virtual Store. The old program works fine, and other programs aren't affected. A similar process handles programs that write to now-forbidden areas of the Registry.

Judging by Microsoft's knowledge-base articles on the subject, your situation (files left in the virtual store after uninstall) clearly is not uncommon. The solution they offer is exactly what you did—delete the leftovers manually. Specifically, you'll open the folder C:\Users\username\AppData\Local\VirtualStore, locate the folder containing files for your now-uninstalled program, and delete the entire folder. It's a simple solution, though it does leave me wondering about the stability of the Virtual Store system.—NJR

NEED ANSWERS? PC Magazine software expert Neil J. Rubenking and ExtremeTech.com editor Loyd Case tackle readers' questions in each issue. Send your toughest to askneil@ziffdavis.com or askloyd@ziffdavis.com.



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Managing Drive Images

Using drive images will save you time and money. *By Matthew D. Sarrel*

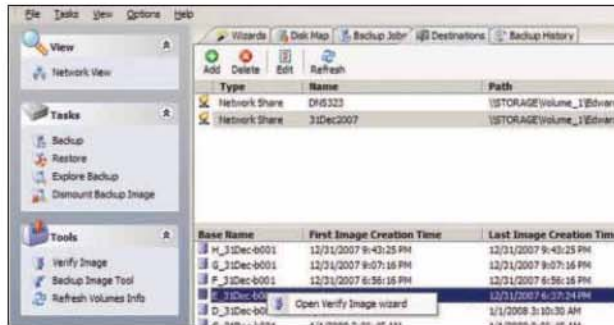
How many hours a year do you spend configuring new PCs? How about reconfiguring those hosed by malware? The hardware takes no time to assemble, so all of that time is spent on software installs and configuration. My solution? Create a series of hard drive images of good PC configurations and install them on bare metal as needed.

A drive image is an archive—a backup—containing the total contents and structure of a hard drive or other media. It contains all the information needed to create an exact duplicate of the original drive, including, for our purposes, the operating system, applications, data, directory structure, and configuration. Many modern drive-imaging utilities can create a single compressed file containing a drive image, which saves storage space.

The Process

Drive imaging notwithstanding, I recommend standardization. Although some drive-imaging utilities support hardware-independent images, having standard hardware and software configurations is ideal for support. Your standard software configuration will consist of an operating system, productivity applications, a browser, any custom applications or databases you use in your environment, and all of your management and security (HIPS, firewall, anti-malware, encryption, vulnerability assessment, and so on).

Now, take the first PC and install, configure, and tweak the software to your



YOUR DRIVE HERE

With drive-imaging software (such as ShadowProtect, shown here), you can keep an image of your perfect hard drive—software, drivers, settings, and all—and flash-install it on new drives with minimal time and effort.

heart's content. And I mean really tweak—remove operating-system and application components users don't need, set up network drive mappings, and set security policy using whichever endpoint security product you've deployed. Apply all current patches to the operating system, applications, and security software. Then emulate typical user activities for a short period of time to test the configuration and verify that it functions properly.

Next, install your drive-imaging software and make a complete image of the standardized PC's hard drive. You can save the image on a network drive, a local drive, or an external hard drive. Whenever you get new hardware, just boot from a recovery disc (each imaging software has its own), point to your image, and re-create it.

Hints from the Experts

1. Consider creating several configurations. For example, a "power user" gets better

hardware and more software, a "basic user" gets less hardware and essential apps only.

2. You'll have to keep patching your images. Keep that first workstation running, and each month download OS and application patches, as well as anti-malware definitions, then re-image.

3. Consider imaging onto an external USB drive. If a PC becomes too riddled with spyware to bear, you can simply walk over with the external drive and restore the clean image. Some software will even let you restore images over the network.

4. Use drive-imaging software to migrate users from one PC to another. Image the old drive and restore it onto the new PC. Of course, you may be moving the bad along with the good.

5. Don't run multiple drive-imaging utilities at once. They don't play well together.

You can read more about drive imaging at go.pcmag.com/drive_imaging.

DRIVE IMAGING WITH VISTA

Pre-Vista, Windows admins setting up drive-imaging systems had no choice but to use third-party utilities; by contrast, in early demonstrations of Vista, Microsoft emphasized the OS's image-management capabilities. You'll find these in ImageX, a command-line tool in Vista used to create and manage Windows image (WIM) files.

To modify volume images, install the Windows Imaging File System Filter (WIM FS Filter) driver from the OS installation disc on a computer running Windows XP SP2, Server 2003 SP1, or Vista. Now mount a WIM file as if it were a directory, and browse, copy, paste, or edit the images right from Windows Explorer.

ImageX command-line options use these conventions: `imagex [flags] [/append | /apply | /capture | /delete | /dir`

`/export | /info | /split | /mount | /mountrw | /unmount] [parameters]`

For example, the instruction `imagex /capture image_path image_file "name" {"description"} {/boot | /check | /compress [type] | /config | /flags "EditionID" | /norpx | /scroll | /verify}` captures a volume image from a drive to a new WIM file, including all non-empty directories and data.

It's possible (though not easy) to install, maintain, and image Vista from the command line without buying another utility. You'll find more details by searching for "ImageX Technical Reference" at technet.microsoft.com. Linux admins will need to use third-party tools as well, but Mac OS X from Panther onward includes capable drive-imaging features.



May 24, 2005
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MARKETING

Podcasting for Profit

From recording to distribution, how to get your message to potential customers. *By Oliver Rist*

Marketing via podcast gets the arched eyebrow from some companies; podcasting is a relatively new concept. But in successful guerilla marketing, experimenting with the new is key. And current marketing research shows this new concept has legs: A recent study done by Arbitron/Edison found that 13 percent of U.S. Internet users listened to a podcast in 2007, and the graphic at the right shows business users who make tech buying decisions have adopted the technology in much greater force. What are you waiting for? You can tap into this ready-made market for less money than you spend on a tank of gas.

Audacity (audacity.sourceforge.net) is my favorite podcast recorder. It's free; available for Windows, Mac OS, and Linux; and easy to use. It also has a significant community; check Audacity's own Wiki page (www.audacityteam.org/wiki) for adding sound effects, editing tips, and more. It's easier to make serious budget mistakes on the hardware side, so take it slow there. My first podcasting sessions were done with a \$45 Logitech phone-style headset.

Getting the Word Out

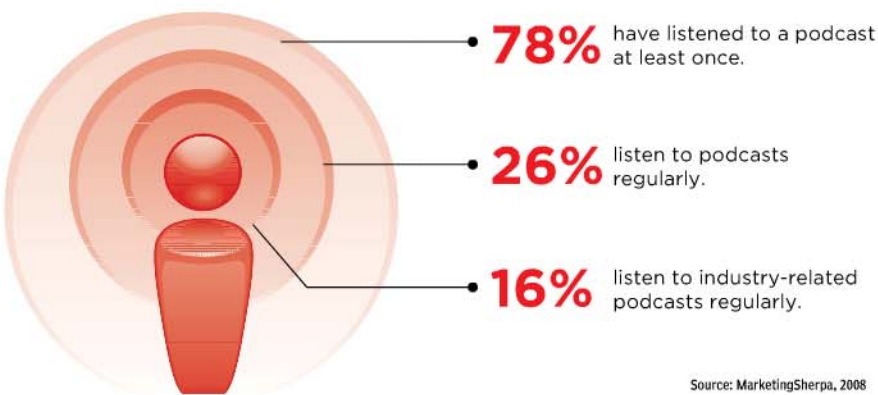
Making the MP3 file is the easy part; distributing it to best effect is the trick. It's certainly easy to submit your recording to iTunes—using iTunes 4.9 or later, click the iTunes Store icon, from *Choose Genre* pick the *Podcasts* category and then click *Publish a Podcast*. But that simply drops your podcast in with the work of a few million other amateurs. Targeting your podcast for a specific audience requires more work.

To begin with, you want at least a basic familiarity with ID3 and RSS tags. ID3 tags are category information, like Artist, Album, and Composer, for MP3 tracks. Searchers use these categories. ID3 tags can support a fairly detailed description of podcast content, series number and recording date, and title—you can even upload a logo to go with each recording.

Once you have an idea of how to position your podcast in the searchosphere, where to drop the actual download becomes important. Podcast hosts, such as

PODCAST LISTENING HABITS

This survey of businesspeople who describe themselves as "involved in tech purchases" shows a large proportion have been exposed to podcasts, and a significant number regularly seek out industry-related podcasts.



Big Contact (www.bigcontact.com) or Liberated Syndication (www.libsyn.com), can make a huge difference. They represent a fast-expanding field among Web hosting companies. You can submit your podcast to iTunes while keeping it on a host's site and gain access to a wide variety of management and positioning tools. Hosts may offer integration with podcast creation apps, the ability to record from a phone or add image art to your podcasts, fan-base management software, RSS and metatag management, and more. Hosting accounts can run from free to upward of \$500 a month.

And how do you find the best host for your business? An easy way is to engage the services of a consultant. Outfits such as Princess Audio (www.princessaudio.com), What I Want Podcasting (whatiwantpodcasting.com), and Blast Podcast (www.blastpodcast.com) can take your raw MP3 and turn it into a professional-sounding audio experience. They help choose the right host for your marketing goals and also help integrate your podcast with the rest of your Web 2.0 marketing efforts. RSS tags are a good example. Podcast content can, and should be, integrated with your Web site and marketing blog, which means the metatags your Web site uses for search-engine positioning and the RSS tags used to

attract the right audience to your blog can also reel in the right podcast audience.

Both consultants and hosts also offer help with podcast advertising. Soliciting advertising for your podcast could result in enough revenue to offset the cost of creating the podcast. Putting your own advertising on other podcasts that might reach your target audience means more exposure for you. Hosts and podcast service providers like RawVoice (www.rawvoice.com) do this professionally, even going as far as offering advertising brokerage services.

Let's Go to the Video?

Another form of podcasting adds video. While similar to audio, video podcasting is evolving differently. Since viewing them requires a screen, many video podcasts are viewed directly from Web sites. Branching out into video podcasting means adding a video player to your site. Production costs are significantly higher: You need not just a high-quality camera and video-editing software but most likely a professional spokesperson—not everyone's face is made for TV. Finally, while there are consultants for video podcast creation and consultants for podcast distribution, I've yet to see one do both. You'll likely need two outside services to help your video podcast to succeed. □

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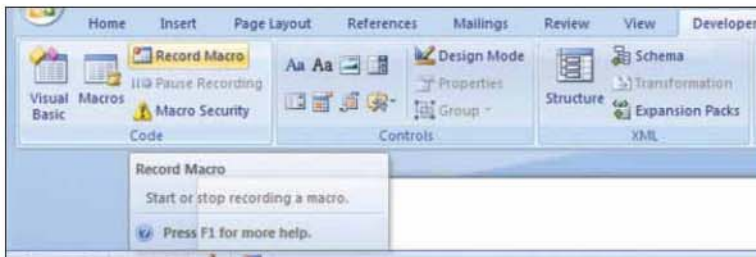
Macros 101: The Quick Access Toolbar

From the very first glimpse the public got of Microsoft Office 2007, many have been concerned about the Ribbon's complete lack of customizability. Microsoft claimed that very few users actually customize their toolbars but conceded that for those who want to, the Quick Access Toolbar, or QAT, was the only way. There is a fair selection of preconfigured buttons to drop onto the QAT (click on the arrow next to it, then select *More Commands*), but for total control, you want a macro.

Macros are a form of programming, and that may make them sound intimidating. But they're simply a series of recorded key-

strokes and mouse clicks. You use macros to automate your work. Instead of doing the same thing over and over again, you invoke the macro to do those tasks for you, saving time and bother. The best part is that creating a macro is as easy as performing the task you want to automate.

Creating macros in Word 2007 (or any other Office 2007 app) requires—before anything else—toggling the *Developer* tab option on; macro controls are located there. To get to it, click the *Office* button, then *Word Options*, and check *Show Developer tab in the Ribbon*.—Neil Randall



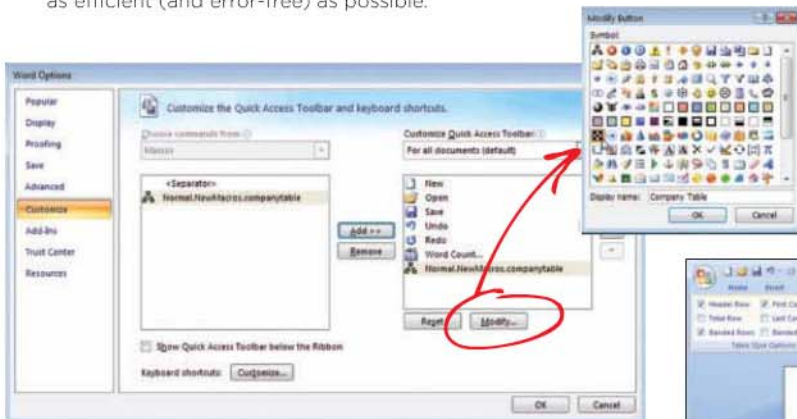
1 GET TO KNOW THE CONTROLS

Click on the *Developer* tab to reveal the macro controls. The *Record Macro* button starts the process; once begun, every keystroke and mouse click will be recorded exactly as you perform them. Later, when you play back the macro, Word will step through each of those actions, replicating them precisely. A bit of planning ahead can help here. Practice your macro before recording so that you can minimize the steps and make it as efficient (and error-free) as possible.

2 BUILD A SAMPLE MACRO

Here, we'll build a macro that creates a table formatted specifically to the layout standards of our company—Word has its own table styles, but we need something different. Furthermore, to make the macro readily available, we'll put it on the QAT.

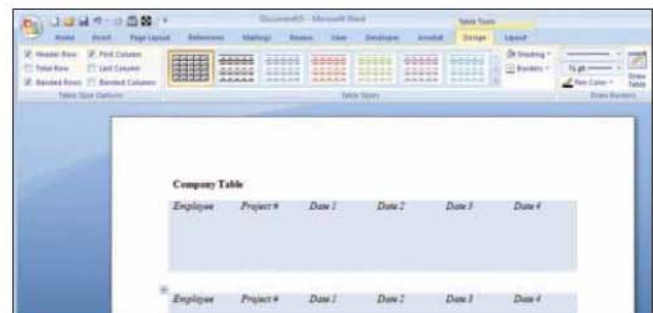
To start, open a blank document in Word and position the cursor where you want your table to appear. Now, access the *Developer* tab, click *Record Macro*, and, in the *Macros* dialog box, provide a name for the macro (no spaces allowed), and, if you wish, a description (useful if you create numerous macros).



3 DECIDE HOW TO INVOKE THE MACRO

From this same dialog, you can assign the macro to a keystroke or, for our purposes, a button. Clicking on the button icon yields the Quick Access Toolbar customization dialog box, with your new macro appearing in the left-hand pane. Select it and click *Add* to place it on the QAT. If you want a different icon for the macro, click *Modify* and choose one from the *Modify Button* dialog. When finished, click *OK* to begin recording your macro.

For our example, we went through Word's *Insert* | *Table* process, styling a table with specific cell, border, and font formatting. You'll have to perform a similar task of your own choosing. And when you're done, go back to the *Developer* tab and click *Stop Recording*.



4 MAKE THE MAGIC HAPPEN

When you click your macro's icon, it will run instantly, so get ready: If your macro inserts an element, position the cursor. If it acts on selected text, select the text. Once you've made a few macros, you'll become attuned to their possibilities and can start increasing their complexity, potentially saving hours of repetitive work. In the next issue we'll discuss what to do if your macro doesn't run quite as planned.

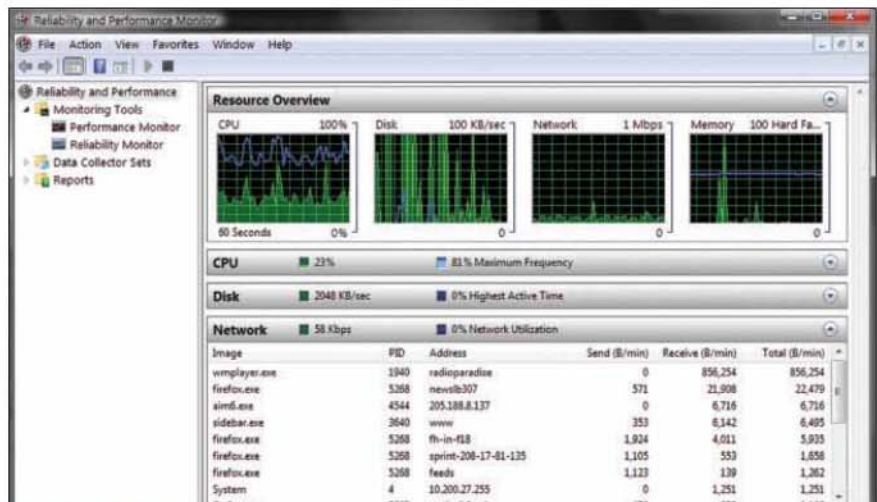
TechTips

Useful tidbits from *PC Magazine* editorial staff, Labs analysts, and readers

WINDOWS VISTA

What's Holding You Back?

Does it seem as if something's dragging on your Internet connection? To see what programs are tying it up in Vista without downloading a separate network-monitoring utility, go to *Control Panel | Administrative Tools*, then click on the *Reliability and Performance Monitor* (or simply search for the monitor from the *Start* menu). This shows graphs and percent of capacity being used for CPU, Disk, Network, and Memory. If you click on the Network bar, it will expand to show you the programs using your connection, as well as how many bytes per minute each sends and receives. If something shows up that you don't want communicating, close the process in the Task Manager.—*Michael Muchmore*



CLOGGED PIPE? The *Network* tab of Vista's *Reliability and Performance Monitor* displays every application tapping your connection.

EMAIL

Use Emoticons to Search Gmail

In Gmail, every built-in view (inbox, trash, read mail) is actually a label. And since Gmail doesn't use folders, if you use the service, you'll end up searching *a lot*. For example, to view all the unread messages from the inbox, you search for `label:inbox label:unread`. To create more involved queries, you can combine the built-in labels with the labels you assign. But such queries can become long and hard to write. Fortunately, you can replace the word *label* with *l* and everything will still work fine. The previous query will become: `l:inbox l:unread`.

That query still too long? Great news: Gmail has shortcuts for the special labels:

- ^b chats
- ^f sent mail
- ^i inbox
- ^k trash
- ^r draft
- ^s spam
- ^t starred messages
- ^u unread mail

That means our query could become: `l:^i l:^u`. What about all the unread messages that aren't in the inbox? Search for: `l:^i l:^u. :-)`.—*Ionut Alex Chitu*, via the *Google Operating System blog* (googlestem.blogspot.com)

WORD

Jump Around

If you're making insertions in a largish Word document and move the insertion point (the line cursor that you see when you click in an editable area) from one location to a distant spot in the document, there's an easy way to have Word move the insertion point back to where it was. Press Shift-F5 and the insertion point moves to the position of that last insertion. Repeated presses of that key combination will cycle the insertion point back to the previous four or so locations it was in before returning to where you first used the key combo.

If you have not moved the insertion point in the document in the current session, the key combination will have no effect.—*Bill Bateman, reader*

MOBILITY

Better Battery Life

Looking to improve your handset's battery life? Try these tips. (1) Reduce your cell phone's screen brightness—this option is usually found in its *Settings* or *Preferences* menu; (2) Disable the Wi-Fi and Bluetooth radios if you're not using them; (3) Run fewer programs in the background on

smartphones, particularly those that poll for voice mail (for example, SimulScribe) or e-mail (BlackBerrys, Treos, and so on); (4) If you've had your handset for longer than a year and a half or so, consider replacing its battery. You can find inexpensive replacement batteries online that will restore the handset to full capacity.—*Jamie Lendino*

WINDOWS XP

Viewing Pictures

When I'm picking out screenshots to run along with product reviews, the Filmstrip mode in Windows Explorer is a big help. But in XP, at least, that option doesn't always show up in the *View* menu. When it doesn't but it should, right-click on the folder in question, select *Properties* from the context menu, click on the *Customize* tab in the window that pops up, and, from the drop-down list, choose *Pictures* (best for many files). *Filmstrip* will now appear as a *View* option.—*Gary Berline*

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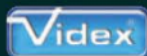
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Dr. Winnifred Cutler Creator of 10X

ABC's 20/20 "SPEED DATE" TEST SHOWS ATHENA PHEROMONES CAN INCREASE SEX APPEAL.

MESSAGE FROM DR. CUTLER

Dr. Cutler has a Ph.D. in biology from University of Penn, post-doc at Stanford. Co-discovered human pheromones in 1986 (Time 12/1/86; and Newsweek 1/12/87).

When ABC 20/20's television crew came out to Athena Institute to interview me, I had no idea of what "test" they might perform on my two pheromone cosmetics. And I did not suggest one. When I saw their 12/9/05 telecast, I found out. ABC 20/20 cleverly picked a "speed dating" contest with identical sets of twins.

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BackSpace

EDITED BY DAN EVANS

The Backspace Movie Minute

To be a tech lover's dream, a film must meet certain criteria. Is it a movie about computers? Check. Is it a movie where said computers may trigger the apocalypse? Check. Is it a sequel to an eighties movie that defined a generation? Check.

Before you get your hopes up: This is not a review of *Terminator 5*.^{*} But *War Games 2: The Dead Code* certainly meets our standards. Twenty-five years after Matthew Broderick and Ally Sheedy pulled us from the brink of World War III, MGM felt the need to take us back to it. This direct-to-DVD offering won't garner the three Oscar nominations that its predecessor did, but if you fancy a film with a dashing nerd hero, a plucky female sidekick, and a preposterous PC-driven plot, this is the movie for you.

Without giving too much away, we can tell you that the lead nerd plays an online game that turns out to be a bioterror simulation—and lands him on a terrorist watch list. He is then chased across the border into Canada by a vengeful computer with



LIVE FROM NERD FORCE ONE We love how the government-issue supercomputers come with super-high-end graphics cards. And apparently 97-inch monitors.

access to all of the world's CCTV cameras, lip-reading skills, and control of deadly Predator drones. Our hero battles this supercomputer armed only with a laptop, a cell phone, a USB key full of guile, and a hot blonde. Not surprisingly, he does pretty well, fending off the government agents who are somehow allowed to chase him through the streets of Canada.

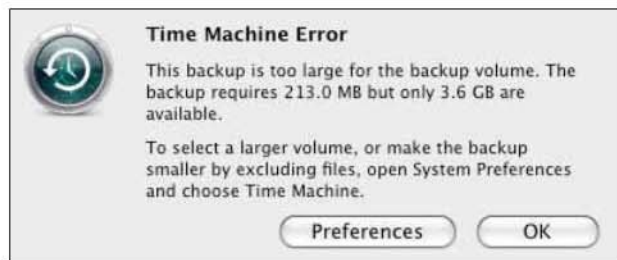
Will the supercomputer reboot, shut down, or nuke Philadelphia? Move this film to the head of your Netflix queue immediately to find out.

**If any PC Magazine readers are connected with this particular project, and won't report us to Skynet, we are amenable to reviewing your film as well.*

Abort, Retry, Fail



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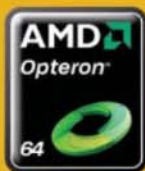


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