

# PC

# MAGAZINE

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## First Looks: CD/DVD-Burning Software

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THE INDEPENDENT GUIDE TO TECHNOLOGY

APRIL 6, 2004

# Help

# What to Do When Things Go Wrong!

SONY

Sony recommends Microsoft® Windows® XP Professional for Mobile Computing.



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The Sony VAIO® Z1 Series Notebook PC with Intel® Centrino™ mobile technology. Ultra-slim. Built-in CD-RW/DVD combo drive, or upgrade to a DVD-RW drive. Up to six hours of battery life.<sup>1</sup> Inspired design meets wireless perfection. Starting at just \$2,099.99 [after mail-in rebate].<sup>2</sup>

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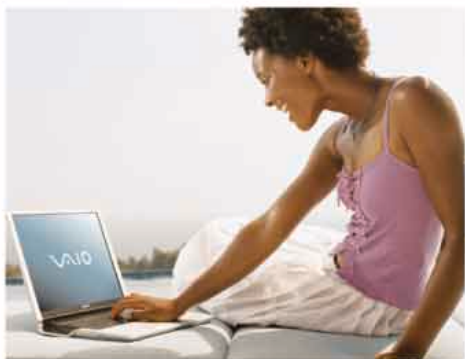
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# SONY



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- 512MB DDR SDRAM
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- Amazing battery life up to 6.5 hours<sup>4</sup>
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- 256MB RAM
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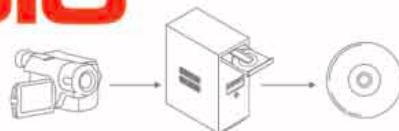
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# Forward Thinking

## FIXING THE E-MAIL MESS

IN OUR FEBRUARY 17 ISSUE we published a cover story on the e-mail mess, in which we examined the problems people are having with spam and viruses. Despite the recent passage of the federal CAN-SPAM legislation and the updating of a number of antispam tools, the problem has only gotten worse in the past few months.

To get to my mailbox, a message has to go through three antispam filters—one on the server, one built into Microsoft Outlook, and a third-party antispam product. Yet more and more spam is getting through. Even worse, the spam is becoming more dangerous, as some messages contain identity theft schemes and e-mail worms.

### Why the Easy Answers Don't Work.

Since that article appeared, I've received a number of e-mail messages from readers who think they have ways to stop spam once and for all. The most common suggestion is that legislation will solve the problem, but I think CAN-SPAM has proved that it won't. Despite a few high-profile prosecutions under the law, the overall level of spam hasn't dropped. I was in favor of CAN-SPAM, if only because a federal law made more sense than lots of state laws. But the idea that any one law can stop spammers is hopeless.

Another group of readers think that a whitelist of acceptable senders combined with a challenge/response mechanism is the only real way to solve the problem. This approach works for individuals who want e-mail only from certain individuals. But it doesn't work for organizations that want to hear from potential customers. And this method is far from ideal if you want to get e-mail newsletters or legitimate notifications from companies with which you do business.

One reader says that the program he wrote to filter out e-mail based on objectionable words has cut his spam in half. All we need is someone to write the filters to stop the other half, he suggests. This is

the idea behind nearly all the antispam products, but the problem is that the spammers keep changing their tactics to get around the filters. For instance, the latest spam is filled with intentional misspellings. The antispam filters continue to improve, but they won't stop the problem completely.

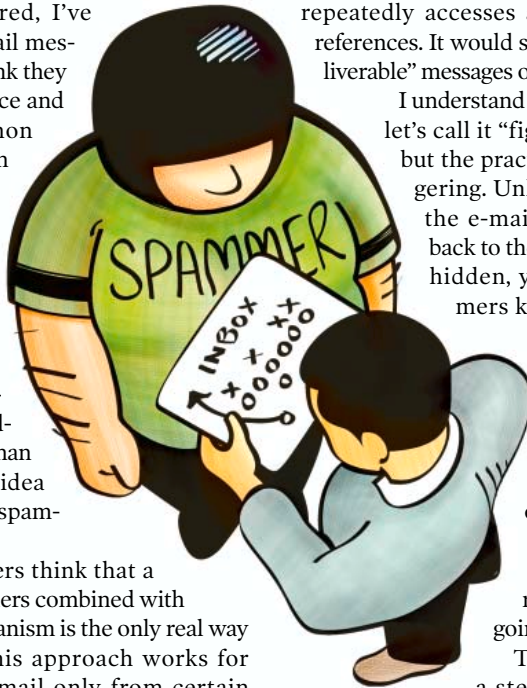
Some readers suggest that the answer is not just to filter the content but also to look for "lies" in the message headers, such as inconsistent or false pathways or travel through servers in foreign countries. Most antispam products already do this, yet the spammers defeat the software anyway.

Another reader says we need a program that lets people mark their spam and then sends repeated messages to any e-mail addresses in the spam and repeatedly accesses any Web pages the spam references. It would stop only when it got "undeliverable" messages or a "page inaccessible" error.

I understand the appeal of this method—let's call it "fighting spam with spam"—but the practical implications are staggering. Unless the return address for the e-mail that your program sent back to the spammers were somehow hidden, you'd be letting the spammers know you exist. And if this were widely used, it would create even more spam to clog the ISPs' gateways and swamp the Internet with denial-of-service attacks. Since a lot of spam originates from hijacked or spoofed addresses, this approach might result in a lot more spam going to innocent victims.

The spammers are always a step ahead. I think the best solution will require major changes to the e-mail system itself.

**The Answer for the Long Term.** What would such bigger changes look like, and could they work? A number of readers think we need a tax on commercial e-mail. But that has some drawbacks: It would work only on spam that originates from the U.S., raise costs for everyone, and open the door for more regulation of e-mail content.



**I understand the appeal of "fighting spam with spam," but the practical implications are staggering.**

# Forward Thinking

MICHAEL J. MILLER

Some readers suggest that e-mail should require postage, an approach that Microsoft's Bill Gates and Symantec's John Thompson advocate. I haven't been a big proponent of this, because it would reduce the value of the medium and lead to new problems. For instance, who keeps the money? But the postage idea seems more viable now than ever before.

Many people have suggested that ISPs should make a certain number of messages free and charge beyond that. And some say ISPs should allow accounts to send only a certain number of e-mails a day. These approaches would work only if all the ISPs had the same policies.

Then there's the "bonded sender" concept, which both IronPort and Vanquish are promoting. It's a variation on the pay-for-e-mail scheme; the sender would pay only if the recipient indicates the e-mail is unwanted.

Another answer is to verify that the e-mail you get is really from the person listed as the sender. This method, called SMTP authentication, checks the sender's address to make sure it's accurate. The big problem with SMTP authentication schemes is that they would require everyone to agree on a standard.

In all these schemes, the e-mail administrator needs to publish information proving that a message claiming to be from a certain domain really is from that domain. A number of proposals would do this, the most popular being the Sender Policy Framework (SPF), which ties in authentication through the DNS server process. This is currently a draft standard and is gaining traction.

.....  
**The big problem with SMTP authentication schemes is that they would require everyone to agree on a standard.**  
.....

Other proposals go farther. DNS Security Extensions adds public-key encryption to the authenticated signature. Yahoo!'s Domain Keys proposal is a variation that also uses public-key encryption along with the DNS system to authenticate domains. IronPort's SMTPi proposal adds identity to SMTP, combines whitelisting with extra identification codes, and adds the management of policies based on reputation. Authenticated Mail Transfer Protocol (AMTP), another draft proposal, uses certificates to ensure secure transfer of mail from one mail server to another.

Any SMTP authentication scheme would require almost every mail server to be upgraded, which is an expensive proposition. Many mail servers are several years old, and people just don't want to change them. And some companies run appliances that may not be upgradable. But even a partial rollout could help, making it harder for spammers to send e-mail from false addresses.

Let's be honest: There is no magic bullet that will stop all spam. I expect antispam products to get smarter filters, to integrate more antivirus and antifraud technology, and to add authentication. But we won't see a perfect solution for a long time.

## SYMANTEC ON THE E-MAIL MESS



RECENTLY I HAD the chance to speak with John Thompson, chairman and CEO of Symantec, the largest antivirus and security software vendor. You can read the full interview online at [www.pcmag.com/interviews](http://www.pcmag.com/interviews). Here are some excerpts.

**MM:** Bill Gates says that we need to charge people for sending e-mail. Do you agree?

**JT:** I happen to agree with that, and I'm delighted to hear that Bill has finally picked up on the theme that I've been on now for years. In the physical world, you charge people who want to engage in legitimate mass marketing. What mass marketers have to do, based upon their anticipated return from a given campaign, is price the package against the deliverable that they want and the mailing cost associated with that to reach the target audience. If you take the same concept and apply it to the digital world, what you get is a charge system for bulk mail over the Internet. ISPs have to change their business

model to count how many pieces of mail customers send.  
**MM:** It's been a busy year in the antivirus world, and we're only at the beginning of February. How can we stop the problems?

**JT:** This activity is exactly what we forecasted last year: The frequency and complexity of the attacks are going to continue to accelerate. Our Internet threat report for the first half of 2004 says that attacks increased by 19 percent. We're starting to see an increasing use of P2P and instant-messaging-type protocols as the basis by which these attacks propagate themselves. The complexity is growing to the point where we see more blended threats than the old-fashioned virus types.

**MM:** I've run into all sorts of people who don't keep their antivirus software current. What can be done about that?

**JT:** As the providers of the technology, we have not done an adequate job of explaining to people that the product has two components: It has a base engine for detection, and it has an update mechanism. The engine is as good as the last update. Unless we can convince people that this is a critical part of the process for protecting their machines, they're not going to see the value of it at all.

.....  
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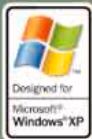
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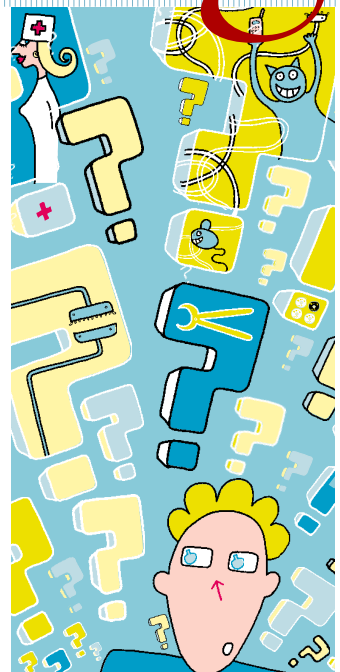
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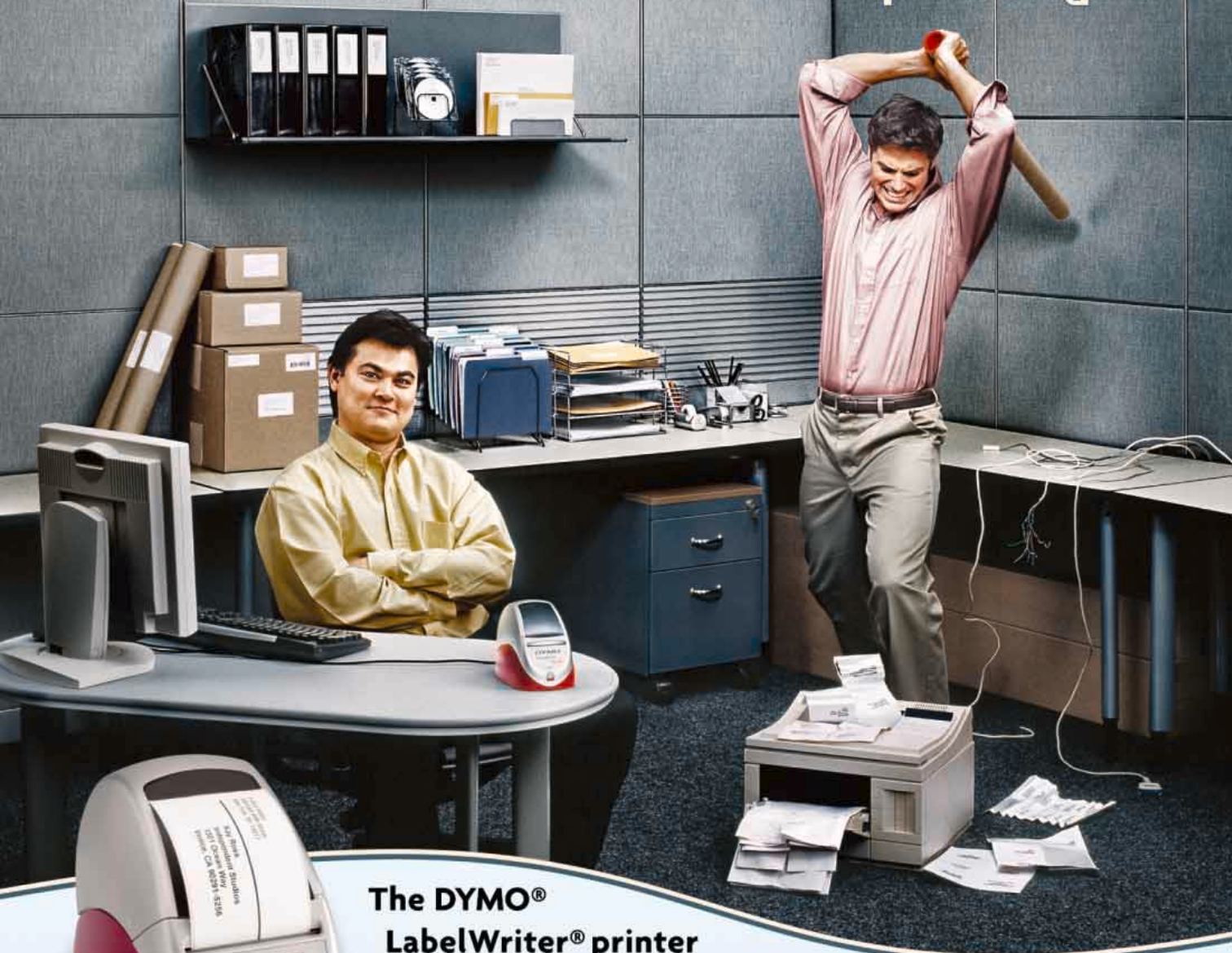


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**AN50R** nForce3  
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**PV-T31K-RA**  
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**Santa Cruz**  
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Dolby Digital - OEM



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**GameSurround  
Fortissimo III**  
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**CRX230E**  
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**MPF920 Black**  
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Disk Drive - OEM



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AMD FX	Athlon™ XP Processor
<b>AMD Athlon™ 64 FX Processor</b> <ul style="list-style-type: none"> <li>The first 64-bit PC Processor in a class by itself designed specifically for cinematic computing</li> <li>Only AMD 64 technology runs today's 32-bit and tomorrow's 64-bit software</li> <li>Full throttle technology for immersive gaming and amazing digital media</li> </ul>	<p>Designed to run home and office productivity software flawlessly</p>
<p><b>Athlon 64 FX-51</b> 1MB L2 Cache 64-bit Processor Model# ADAFX51BOX <b>\$742.00</b></p>	<b>\$215.00</b> <b>\$166.00</b> <b>\$121.00</b> <b>Athlon XP 3200+</b> 400MHz FSB 512K Cache Model# AXDA3200BOX <b>Athlon XP 3000+</b> 333MHz FSB 512K Cache Model# AXDA3000BOX <b>Athlon XP 2800+</b> 333MHz FSB 512K Cache Model# AXDA2800BOX

<b>\$733.00</b> <b>Athlon 64 FX-51</b> 1MB L2 Cache 64-bit Processor Model# ADAFX51CEP5AK OEM	<b>\$214.00</b> <b>Opteron™ Model 240</b> 1MB L2 Cache 64-bit Model# OSA240CC05AH	<b>\$207.00</b> <b>Athlon XP 3200+</b> 400MHz FSB 512K Cache Model# AXDA3200D OEM	<b>\$158.00</b> <b>Athlon XP 3000+</b> 400MHz FSB 512K Cache Model# AXDA3000DKV4E OEM	<b>\$113.00</b> <b>Athlon XP 2800+</b> 333MHz FSB 512K Cache Model# AXDA2800DKV4D OEM
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<b>\$81.00</b> <b>512MB PC-2700</b> 184 Pin DDR333 SDRAM Unbuffered - OEM	<b>\$84.00</b> <b>512MB PC-3200</b> 184 Pin DDR400 SDRAM Unbuffered - OEM <b>\$80.00</b> <b>512MB PC-3200</b> Value Series 184 Pin DDR400 SDRAM Unbuffered - OEM
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<b>\$70.50</b> <b>Special Edition</b> 80GB 7200RPM IDE Ultra ATA 100 Model# WD800JB	<b>\$60.00</b> <b>6E040L0</b> 40GB 7200RPM IDE Ultra ATA 133 <b>\$80.00</b> <b>HDS722580VLSA80</b> 80GB 7200RPM Serial ATA
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<b>\$193.00</b> <b>PX-708A/SW</b> 8x DVD±RW Drive Internal IDE 2MB Buffer	<b>\$108.99</b> <b>ND-2500A BLK</b> 8x DVD±RW Drive 2MB Buffer - OEM <b>\$121.99</b> <b>DWU14A</b> 4x DVD±RW Drive Internal 8MB Buffer OEM
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<b>\$46.99</b> <b>4x 4.7G</b> 50 Pack DVD-R DRD-47-4X-RDSM OEM	<b>\$41.00</b> <b>STI-USB2FD/128</b> 128MB USB 2.0 Flash Pen Drive	<b>\$104.00</b> <b>750MB External</b> USB Zip Drive Model# 32324
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# PIPELINE



## Beyond Sensible Shoes

Consider clothes that can think.

The phrase *second skin* may soon refer to garments far more intriguing than curve-clinging clothes draped on supermodels. Unlike that version of second skin, the new version doesn't elicit reactions; it monitors them.

Smart Skin, still in development, is made of a flexible material embedded with microsensors that mimic the signal sending of nerve cells. The sensors, which wirelessly communicate with receiving devices, can already monitor temperature and infrared radiation and are expected to detect pressure, touch, and even vital signs.

The work being done on Smart Skin is part of a big ramp-up in research on microelectromechanical systems, or MEMS, which are expected to imbue many kinds of inanimate objects with the intelligence to sense and communicate. Spouses Zeynep Celik-Butler and Donald Butler brought the project to the University of Texas at Arlington with a \$300,000 grant from the National Science Foundation.

Smart Skin has many poten-

tially promising applications. Microsensors on a flexible substrate allow for smaller, lighter designs than those based on rigid wafers, and Donald Butler predicts that "in the long term, electronics is going to move toward flexible materials."

One of the primary applications for Smart Skin may be detecting signs of an illness or emergency such as SIDS: An infant's pajamas could alert parents to temperature, pressure, and pulse changes. Soldiers, industrial workers, and astronauts could wear Smart Skin clothing or gloves embedded with chemical sensors that alert them to nearby toxicity.

Butler also hopes Smart Skin will shake up the field of robotics. With sensors distributed across its entire surface, a robot might gain more autonomy and greater perception. Nanorobots and tiny flying vehicles could acquire improved surveillance capabilities.

Smart Skin will go into production in approximately five years, says Butler. By then, your clothes may know a lot more about you.—*Alexandra Robbins*

## Mobile Movies

MICROSOFT AND DISNEY ARE NOW kissing cousins in a multiyear agreement to cooperate on digital-media initiatives. The news arrived only days after Apple Computer announced plans to sever long-standing ties with Disney. Under the deal, Disney will license Windows Media digital rights management (DRM) technology, and Microsoft will get Disney content.

"It's not surprising that Disney went with Microsoft, which has been devoting a lot of research to digital rights management," says Dwight D. Davis, a VP at market research firm Summit Strategies.



The bigger winner in the deal may be Microsoft. Its Media Center Extender initiative is partly focused on putting movies on gadgets such as Portable Media Centers. When the first Portable Media Centers ship later this year, expect to see content from Disney and several other Hollywood partners.—*Sebastian Rupley*

## Anything but Authentication

Several software companies have been criticized for forcing users to authenticate software before it will function properly. But a recent survey found that while nearly half of software users are concerned that titles they buy might be pirated, fewer would ever take the extra step to authenticate their software with the manufacturer.

Source: Market Trends, January 2004. From a survey of 1,100 U.S. software users.

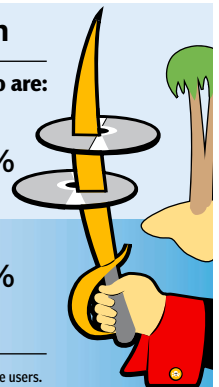
### Software users who are:

concerned that products they purchase are counterfeited or pirated

49%

willing to take the extra step to authenticate a product after purchasing

46%



### REAL PROBLEMS

After researchers at British firm NGS Software blew the whistle on several security holes in RealNetworks' media players that could let malicious code spread, RealNetworks issued a series of patches. They're available free of charge at the company's customer support site. The affected players are RealOne Player, RealOne Player 2, RealPlayer 8, RealPlayer 10 Beta, RealOne Enterprise Desktop, and RealPlayer Enterprise.

### WIRELESS SPEED TEST

Nextel Communications has begun tests on a fourth-generation (4G) wireless broadband network in North Carolina's Raleigh-Durham area. Cisco, IBM, and Nortel are participating in the trial, which uses Flarion Technologies' Flash-OFDM technology. Nextel claims the service offers download speeds of up to 1.5 megabits per second, which would compete with DSL and cable modem speeds, without the wires.

### NANOTECH'S RISE

The global market for nanotechnology—the science of manipulating matter on a tiny scale—was estimated at \$7.6 billion in 2003, but researchers at Business Communications Company are forecasting growth at 30 percent per year, to reach \$28.7 billion in 2008. That's twice the expected growth rate of the biotechnology market.

## Software Gloom

Except for personal finance, tax, and security titles, software sales appear to be in bad shape. The market for PC software declined in 2003—the worst fall in four years, according to market research firm NPD Group. The drop in PC software retail sales was 4 percent, from \$3.84 billion in 2002 to \$3.68 billion in 2003.

Education, operating systems, gaming, and imaging and graphics software all saw big declines in unit sales. “Educational-software unit volume has lost almost one-half of its revenue and more than one-half of its



unit volume since 2000,” say NPD researchers.

On the flip side, unit sales of system utility software grew a healthy 13 percent last year, mainly because of a growing demand for Internet security software. Antivirus products were among the best sellers. That demand comes in response to an evolving set of security threats, according to security expert Gene Spafford, a professor of computer science at Purdue University.

“Overwhelmingly,” he says, “the tendency with security is to try to patch and fix the problems we’re seeing now, instead of looking out and seeing the big picture. You can listen to the antivirus vendors saying they’re making progress, but that just doesn’t seem to be the case.”

Ironically, one of the few bright spots on the software front going forward may be the result of a problem that just keeps getting worse.—SR

## P2P Players Back in Court

TOUGH TIMES PERSIST for file-sharing services. In February, major movie studios and the recording industry renewed their fight against Grokster and Morpheus, two leading peer-to-peer (P2P) file-sharing services.

Last April, citing a 1984 case involving Sony, maker of the Betamax VCR, U.S. district court judge Stephen Wilson held that Grokster and StreamCast (which owns Morpheus) were not responsible for copyright infringement, although people use their services to download copyrighted content. The U.S. Court of Appeals for the Ninth Circuit has now heard an appeal from the Motion Picture Association of America (MPAA), the National Music Publishers Association of America (NMPA), and the Recording Industry Association of America (RIAA).

In the famous 1984 case involving Sony, the Supreme Court found that although the Betamax hardware let consumers copy and share television shows and movies, Sony was not in violation of copyright law, because people mostly used the VCR to watch shows after they aired and then taped over them.



“The court felt it ought to provide some shelter from liability if—and only if—the product being distributed has substantial non-infringing uses and the company has no control over how the product is used,” says Evan R. Cox, a Covington & Burling attorney.

The MPAA, NMPA, and RIAA claim that unlike Sony, Grokster and StreamCast have complete control over how their services are used.

Whichever way the current battle plays out, the file-sharing industry desperately needs an affirmation. Recently, the file-sharing service Kazaa was used to propagate MyDoom—the fastest-spreading Internet virus ever, according to some. And the RIAA has been vigorously suing file sharers. Dark clouds loom over the P2P arena.—Cade Metz

## Got Your Number

You want to e-mail a friend or colleague’s cell phone, but all you have is the phone number? Your problem isn’t uncommon. Cellular-service providers operate their own mail servers and have their own addressing protocols. The situation is especially sticky if you don’t know the service provider.

California entrepreneur Guy Botham has built a solution and filed for a patent. His company, Teleflip, operates mail servers that let you send text messages to any U.S. cell phone, as long as you know the phone number. To send a message, you enter the number with the suffix @teleflip.com, and Teleflip routes the message. Mail servers look up the correct suffix for the wireless provider.

Botham says wireless carriers have expressed interest in his free service, though there are concerns about Teleflip-forwarded spam. “I run spam filters and place limits on the number of messages one person or IP address can send in a day,” he says. That won’t eliminate spam entirely, but Teleflip does bridge over 70 disconnected wireless carriers.—SR

## Flexible Display Forecast

After years of slow but steady progress, momentum is picking up for one of technology’s Holy Grails: the flexible plastic display. A group of researchers from the University of Toronto recently announced that it has created displays using *organic light-emitting diode* (OLED) technology on flexible plastic and metal. Meanwhile, Philips Research has created a new division that will mass-produce foldable plastic displays in 2005.

OLED panels are emissive, like liquid crystal displays (LCDs), but they’re much thinner. The thin layers make OLEDs ideal for flexible displays, though sealing an OLED, with the materials protected from damaging oxygen or water vapor, poses challenges.

The Toronto group’s panel is passive-matrix, which means that each image is created using simple row and column electrodes to excite the pixels. But according to the lead researcher,



Professor Zheng-Hong Lu, active-matrix displays, in which each pixel is controlled by a transistor,

can use the same technology. The flexible OLED panels have unique design features, he says, but the team can’t disclose any details while pursuing patents.

Meanwhile, marking the biggest ramp-up in flexible-display manufacturing yet, Philips Research scientists say a new division called Polymer Vision will be ready by 2005 to mass-produce foldable plastic displays. The researchers have used plastic circuits, which power monochrome displays on very thin sheets of plastic, incorporating technology from E-Ink (see the photo).—Alfred Poor





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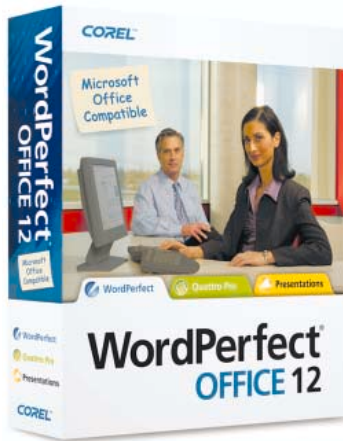


# COMING ATTRACTIONS

## The *Other* Office

With **WordPerfect Office 12**, Corel hopes to steal some thunder from the dominant productivity suite, Microsoft Office. WP Office 12's word processor, spreadsheet, and presentation creator will feature file compatibility with their Microsoft rivals, and the suite will deliver workflow enhancements to ease the transition for those moving from MS Office. A new Workspace Manager will let users adjust the interface to the look they prefer (including MS Office), while a Compatibility Toolbar will let a user publish to XML, HTML, PDF, and other formats.—*Jamie M. Bsales*

Pricing not yet determined. Corel Corp., [www.corel.com](http://www.corel.com).



## Olympus Hits 8MP

The new Olympus C-8080 Wide Zoom camera system should make photography hobbyists take notice. Built around an 8-megapixel image sensor, this prosumer entry features fast start-up and shot-to-shot recycling times, thanks to the Olympus TruePic Turbo image processor. The camera comes with a 5X optical zoom wide-angle glass lens (a 28-mm to 140-mm equivalent). A mode dial enables quick settings for an assortment of shooting situations (including Portrait, Sports, Landscape, and Night Scene modes), and the camera provides eight customizable MyMode settings that give quick access to frequently used settings of your choice. The multiposition 1.8-inch LCD screen is augmented by a high-resolution electronic viewfinder. Olympus has planned a full range of accessories for the C-8080, including additional lenses.—*JMB*

\$1,000 street. Olympus America Inc., [www.olympusamerica.com](http://www.olympusamerica.com).

## Flexible UPS

Falcon Electric has unveiled the world's first universal-input line-interactive UPS product line, the **Falcon SUP Series**. Available in 700-VA and 1-kVA models, a Falcon SUP gives companies flexibility to use U.S. equipment internationally, since the unit can accept a 120V through 220V AC input and provide a fixed 120V output. The units also have user-friendly LCD readouts that show detailed UPS and power information at a glance.—*JMB*

\$449 list and up. Falcon Electric Inc., [www.falconups.com](http://www.falconups.com).



## DVD Creation Suite

321 Studios is bundling new versions of six of its most popular CD and DVD creation utilities into one suite, **DVD X Tools**. Chief among them are DVD X Show, which lets you create a CD- or DVD-based motion slide show from your digital stills; DVD X Rescue, which can salvage damaged CDs and DVDs; and Audio X Tools, which lets you create music CDs.—*JMB*

Pricing not yet set. 321 Studios, [www.321studios.com](http://www.321studios.com).



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If you like a keyboard to use with your PDA but hate carrying two things, iBIZ Technology has an answer.

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The new **discWelder Bronze** lets consumers write their own DVD-Audio discs without buying a high-end audio package.

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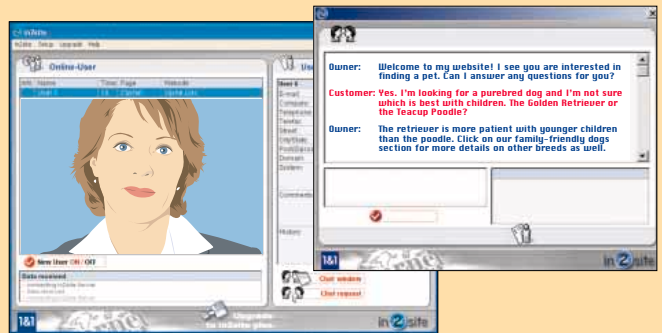
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Carl	Brown	653 Liberty Avenue, Wilmington, NC 28403	brownc2521@lycos.com
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Recipient's E-Mail	lisa@beau.com
Message	Hi Lisa, I came across this site and thought you'd be interested.

Invitation to: Gallery Opening June 14, 2004	
Photo Exhibit	Hosted by: Susan Howard
Where:	Impressions Gallery Where: 293 Oregon Avenue, Denver, CO 80216
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- 1&1 WebMail
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- FrontPage 2002 extensions
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- 30,000 MB/Month bandwidth
- Protected by up-to-date firewall
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- Server priority
- Daily backups

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- WebsiteCreator for 25 pages
- Full version software worth \$550
- 1&1 Control Panel

#### EMAIL

- 300 POP3 email accounts
- Aliases, auto-responders, forwarding
- 1&1 WebMail
- Virus scanner for 6 POP3 accounts

#### WEBSITE FEATURES

- Logfiles
- CGI library (counter, guestbook, etc...)
- Own CGI programming
- FrontPage 2002 extensions
- Advanced password protection
- Perl, PHP3 and PHP4
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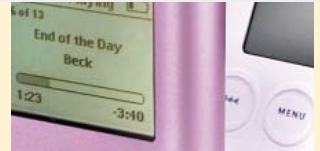
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## HANDS-ON TESTING OF NEW PRODUCTS

- 32 Apple iPod Mini
- 34 D-Link SecuriCam DCS-5300W Internet Camera
- 34 Toshiba IK-WB11A Wireless Network Camera



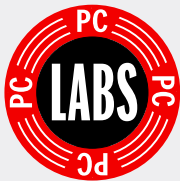
- 34 Veo Wireless Observer
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## CD/DVD Suites Bulk Up on Extra Features

BY DON LABRIOLA

THE MAGAZINE  
WORLD'S LARGEST  
COMPUTER-TESTING  
FACILITY



For years now, the leading CD and DVD creation suites have been jacks of all trades but typically masters of just one: CD creation.

- But the new entries from Nero and Roxio raise the bar: You can purchase one and satisfy all your creation, authoring, editing, and archiving needs. The new suites from NTI and Sonic, meanwhile, offer strengths and features that you may find

appealing as well. We put the latest build of each of these four through their paces to see which media creation suite delivers the best features and user experience.

### Nero 6 Ultra Edition 6.3

Version 6.3 of Nero's suite isn't so much an upgrade as it is the fulfillment of a promise. Its most important enhancements had originally been announced with last summer's Nero 6 Ultra Edition 6.0 version (First Looks, September 2, 2003) but have only now been implemented in this latest release.

One of the most significant features is support for Ahead's new Nero Digital MPEG-4 file format, which pairs ISO-standard MPEG-4 video with High Efficiency AAC audio. During our hands-on evaluation, the Nero Digital encoder took a mere 52 minutes to compress the video footage contained on a 7.2GB dual-layer DVD (nearly 3 hours' worth!) into MPEG-4 files small enough to fit on a single 700MB CD.

Picture quality was compara-

ble to that of a typical 65-minute VideoCD or 500MB-per-hour DivX AVI movie, and when we repeated the test with less compression, output quality was at least as good as anything we've seen produced by a consumer-oriented software codec. Our sole reservation was the fact that Nero Digital files require a player equipped with the proper codecs, which today, at least, limits them to a small number of set-top boxes and to

PCs running Nero 6.3.

Complementing this technology is Nero 6.3's new Recode 2 module, which lets you create DVDs, VCDs, and Nero Digital files by simply dragging content from existing DVD-Video discs. Besides offering standard disc copying (as well as the ability to squeeze a dual-layer DVD onto a single piece of media), Recode's flexible layout options let you mix assets from different titles and even store several complete

DVDs on the same disc.

As with Roxio Easy Media Creator 7, the core Nero 6.3 bundle offers a broad array of music, backup, photo, video, media player, and disc-copying operations. But that's where the similarity ends. Whereas Creator 7 displays its entire task-oriented menu system on one easy-to-read screen, Nero 6.3's tabbed StartSmart program-launcher lets you control which applications are associated with each menu task. It also provides options, including a Favorites list, a choice between Beginner and Expert modes, and user-selectable color schemes.

Unlike Creator 7, Nero 6.3 can schedule unattended backup jobs, but it lacks Roxio's ability to create encrypted, password-protected archives. Both suites contain an exhaustive selection of drag-and-drop disc layout options, but in other areas, the programs aren't so evenly matched. Even Nero 6.3's modest sound-editing module boasts dozens more effects, sound-processing utilities, and filters than Creator



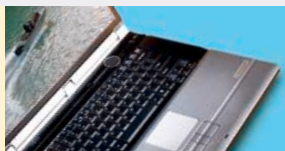
Nero's elegantly designed StartSmart launcher packs a huge number of options into a compact, easy-to-navigate interface.

PHOTOGRAPHY BY THOM O'CONNOR

# L O O K S

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#### WHAT THE RATINGS MEAN

- EXCELLENT
- VERY GOOD
- GOOD
- FAIR
- POOR

7's meager audio-editor applet. But Nero 6.3 offers no dedicated image-editing component that can touch Creator's powerful PhotoSuite 7.

Nero 6.3's much improved NeroVision Express 2 video-editing, slide show, and disc-authoring module permits more precise control over menu layouts. Also, its flexible output options made it possible for us to squeeze more than 3 hours of DivX source material onto a single DVD disc. But its video-editing tools don't approach the flexibility of Creator 7's impressive VideoWave 7 application, which offers sophisticated multiple-timeline capabilities, intelligent one-click movie-production tools, and a dazzling array of effects and overlay capabilities that leave NeroVision in the dust.

Still, Nero 6.3 remains a formidable contender, especially for more advanced users who want top-notch CD and DVD creation options and won't miss the photo- and video-editing tools Creator 7 delivers.

#### Nero 6 Ultra Edition 6.3

Street price: \$80. Ahead Software, [www.nero.com](http://www.nero.com). ●●●●

### NTI CD & DVD Maker 6.7 Platinum

As one of the last disc creation packages to be reinvented as a soup-to-nuts digital-media suite, this greatly expanded version of NTI's CD & DVD Maker enters the market at a strategic disadvantage. But while its new components don't always stand up against the more mature competitors, this fledgling suite offers a first-rate interface and more than a few unique features.

Central to this new release is

NTI's core disc layout application, CD & DVD Maker. It supports a show-stopping selection of audio, data, and mixed-mode disc layouts and contains tools that let you create slide shows, edit sound files, copy DVDs, play

graphical menu that displays translucent pop-up menus when you click any of its main task categories. Choosing an entry automatically launches the correct module configured with the right settings for the job. Most

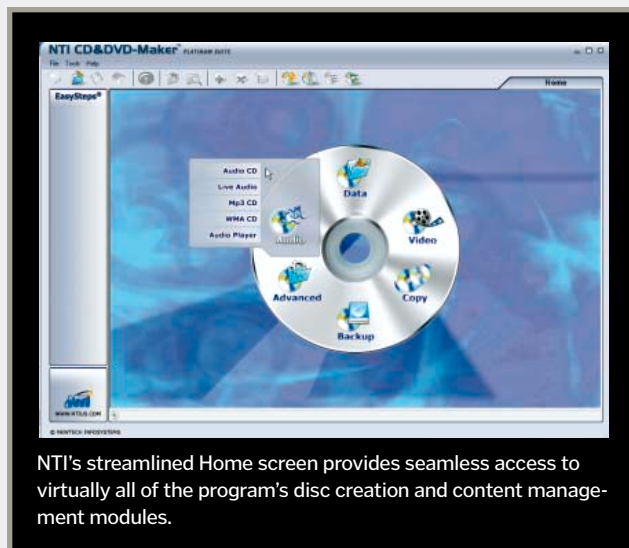
caching process, and verify copied discs. But it lacks more common features like the ability to read and write non-proprietary ISO disc-image files, select which titles to copy from a DVD, and compress dual-layer discs to fit onto a single piece of media.

Worst of all, CD & DVD Maker's slick new interface has not yet been extended to its audio and video editors, backup and cloning programs, and DVD player, making the package feel more like a collection than a suite. Roxio has taken the lead among suites in this regard.

Video editing and disc authoring are handled by a Home Video Maker module that gives you an impressive number of file import and export options, as well as the ability to record live audio and video feeds directly to disc. A good variety of storyboard and timeline editing capabilities has most of the standard movie-making tools you'd expect from a standalone consumer package, as well as exotic features like smooth real-time preview when you use a slider to vary playback speed (from 20 to 500 percent).

But the program's limited menu-building facilities don't let you manually position buttons, add audio, or create animated or video backgrounds. And although its output module can export content to external recording devices, e-mail services, and a broad range of file types (MPEG-1, MPEG-2, AVI, WMV, QuickTime, and more), it lacks the ability to optimize file sizes or compression rates to best match disc capacity.

CD & DVD Maker shows promise, but a lot of gaps need to be filled before it can com-



NTI's streamlined Home screen provides seamless access to virtually all of the program's disc creation and content management modules.

music, design labels, and convert DivX content to VCD-ready MPEG-1 files. (You'll need a \$20 add-on to convert DivX files to DVD-compatible MPEG-2.)

Advanced features let you automatically balance the volume of each track when burning audio CDs; compare a pair of folders or discs bit-by-bit; and use global wildcards to filter file selections during various types of data, audio, video, and slide show projects. All this power is complemented by modules for external video editing, DVD authoring, and hard drive cloning. There's also a DVD player applet and system backup utility.

We were particularly impressed with Version 6.7's carefully crafted interface. The program opens with a disc-shaped

screens display a common main menu and button bar that are cleverly designed to operate as similarly as possible in each application. The EasySteps pane divides each job into numbered tasks and displays detailed instructions that explain how to complete each step.

But much of CD & DVD Maker's remaining feature set is a frustrating mix of advanced features and unfortunate omissions. CD & DVD Maker offers a Norton Ghost-style hard drive cloning tool, but it contains only a trial version of its otherwise-powerful file-level backup utility.

The package's disc-to-disc copying module is packed with luxuries that let you set overburning options, copy content across a network, fine-tune the

pete effectively with the latest powerhouses from Ahead and Roxio. Its core disc creation application is as good as any we've seen, but most of the rest of the suite isn't as well integrated or complete as those others.

#### NTI CD & DVD Maker 6.7 Platinum

\$80 street. NewTech Infosystems Inc., [www.ntius.com](http://www.ntius.com). ●●●●●

## Roxio Easy Media Creator 7



Roxio Easy Media Creator 7 is much more than just the latest spin of the company's immensely popular Easy CD and DVD Creator digital-media suite. Boasting an enormous number of enhancements and a radically improved interface, Creator 7 is the first Roxio suite that convincingly presents itself as a single, coherent application.

Where its predecessor merely bound together a set of loosely knit utilities (some that Roxio developed, some that it acquired) behind a simple module launcher, Creator 7's task-oriented interface has the feel of a unified solution designed from the ground up to handle an exhaustive selection of audio, video, image-editing, slide show, backup, and mastering chores.

The most obvious difference in Creator 7 is the elegantly designed multipane Home screen. Simply choose what you want to accomplish (copy track from an audio CD, copy a data disc, import photos, and so on) from the menu of common tasks—listed beneath the understandable headings of Music, Data, Photo, Video, and DVD—and the program then automatically selects the right tool for the job. Other panes let you resume recent projects with a double-click and launch any component module by name. The Creator 7 Home screen can't be customized (Nero 6.3 offers a more flexible tabbed Launcher interface), but it does allow simultaneous access to every component on a single screen.

And it lets you collapse unused panes out of the way so that only your favorites are visible.

As with prior versions, Creator 7's core component is the original Creator Classic mastering program, which continues to offer a comprehensive selection of CD and DVD disc layout and burning features. Besides the ability to handle almost any type of audio or data format, this version adds a backup function capable of generating password-secured archives protected by 128-bit encryption.

Creator 7 also contains the full version of Roxio's PhotoSuite 7 Platinum entry-level photo-editing program (also available separately for \$49). PhotoSuite has come of age as a welcoming, intelligent package. It doesn't have the truly advanced photo-editing tools of competing programs such as Adobe Photoshop Elements or Jasc Paint Shop Pro, but it is a very focused, easy-to-use program for fixing photos, adding nice effects and using them in projects.

Workflow in PhotoSuite is

previews before accepting the change. Unfortunately, getting photos into MultiPhoto Enhance is a multistep process; a Windows Explorer-type drag-and-drop import would be welcome here.

The Selection tool (called Cutout) is much improved, and masking (for limiting edits to specific areas of a picture) has been added. PhotoSuite now has smart edge detection for both cutouts and masks, which has been a staple in the competitors. Depending on the edge's complexity, the tool does a

good to very good job, with adjustments easy to make after creating the initial cutout or mask. The excellent new Touchup Brush paints precise edits, such as lighten, darken, colorize, sharpen, tint and saturate, onto your picture.

PhotoSuite's most important new feature is StoryBoard, which can produce sophisticated slide shows with still images, video clips, audio tracks or custom narration, text and transitions. Special effects can be applied over time and associated with individual frames or a series of



Roxio's task-oriented Home screen lets you initiate a broad variety of tasks without worrying about what goes on under the hood.

Other enhancements include a much needed media preview window and streamlined CD-ripping facilities that give you a choice of MP3 encoders.

Yet another compelling component is the Disc Copier module, which offers versatility in a class with that of Pinnacle InstantCopy and InterVideo DVD Copy. Disc Copier produces perfect duplicates of most types of CDs and nonencrypted DVDs, reads and writes several flavors of image files, and can compress dual-layer discs onto one piece of recordable media. Uniquely, it boasts the ability to search your computer for previously stored disc images and displays a handy pre-burn menu that lets you preview each piece of content on your source disc before choosing which assets to copy.

quick and intuitive, and (as with Creator 7 as a whole) the integration of the components is better than it was in the previous version. PhotoSuite no longer straitjackets users with its step-by-step guidance. Instead, it supplies advice and information about tools and options in a flexible format more respectful of the user's intelligence.

PhotoSuite 7's new features are a combination of real innovation and simply catching up with the competition. The new MultiPhoto Enhance can apply photo edits (exposure, sharpness, red-eye reduction, rotate, and so on), a renaming command, or file format conversion to a group of selected photos. Instead of judging the results on small thumbnails, users can look at full-size zoomable individual

frames. With the Motion Picture tool, you can create wonderful, documentary-type effects (know in Apple's iPhoto as the Ken Burns effect), zooming in and moving about a single still photo over a custom-defined duration. Or you can apply an auto Motion Picture to a single photo or a group of selected photos. StoryBoard delivers great control and yields impressive results, and it's easy to use.

Another dramatically enhanced component in Creator 7 is its VideoWave 7 video editor, which now approaches the power of standalone applications like Pinnacle Studio. VideoWave offers both timeline-view and storyboard-view editing, powerful 3D animated titling, and a generous assortment of imaginative transitions,



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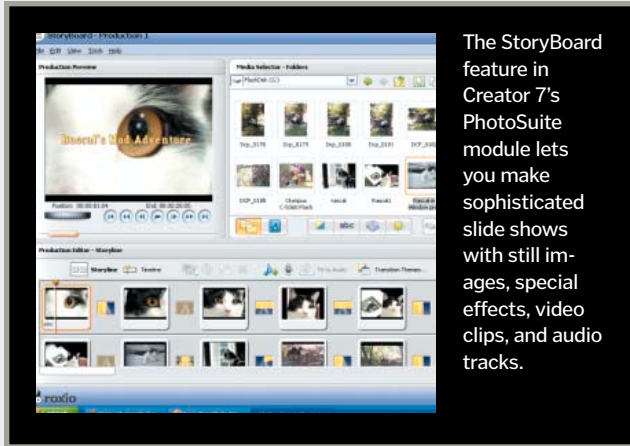
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The StoryBoard feature in Creator 7's PhotoSuite module lets you make sophisticated slide shows with still images, special effects, video clips, and audio tracks.

filters, effects, and video-overlay capabilities.

Besides the seven video, audio, and overlay tracks located on its standard project timeline, the program lets you open an additional nested seven-track timeline for each piece of content. This makes it possible to generate picture-in-picture overlays, animate several blocks of text simultaneously, and produce a variety of other sophisticated effects. And if all this weren't enough, VideoWave even supplies a pair of automated movie production wizards (think muvee's auto-Producer applet) that generate flashy effects-laden music videos and produce event-themed template movies that you can customize with your own clips, titles, and special effects.

Creator 7's DVD Builder authoring module isn't nearly as flexible, but it gains synergistic power from its tight integration with the rest of the suite. It shares content seamlessly with VideoWave, and both applications use the same Roxio Capture utility, which can record live audio/video feeds and even extract content from existing DVD-Video discs and hard drive DVD folders. Both programs also lay claim to a common output module that lets them export content in either NTSC or PAL format to VCD, SVCD, "DVD-on-CD," and standard DVD-Video discs, as well as to MPEG, AVI, WMV, DivX files, e-mail messages, and online

video-sharing services and to external analog and digital devices like TVs, VCRs, and camcorders.

Adding to the "but wait—there's more!" feel of the suite, Creator 7 also has a media player, a modest sound editor, the latest version of its Drag-to-Disc packet-writing utility, an embedded interface to Roxio's Napster online music service, interactive tutorials, and a Media Manager content organizer that lets you browse, sort, and preview stored media. Rounding out the package is an excellent Label Creator module packed with themed presets that let you easily create great-looking labels and inserts for full-size and mini-DVDs and CDs, jewel cases, and clamshell boxes.

Despite all these strengths, this first release of Creator 7 isn't perfect. We ran into minor display bugs in Label Creator, and Sound Editor's limited feature set is adequate only for the simplest audio-processing jobs. Additionally, the Creator Classic module can't schedule backup jobs, and we found the nonstandard Media Manager-based file browsers used by many components to be a bit cumbersome.

But these are nits compared with Creator 7's extensive feature set and beautifully integrated interface. The remarkable depth of its disc creation, video production, and image-editing components makes it our first choice among the latest generation of digital-media suites. Easy

Media Creator 7 is a fine product and a triumphant step forward for Roxio.

Roxio Easy Media Creator 7  
 \$99 direct. Roxio Inc., www.roxio.com.  
 ●●●●●

### Sonic MyDVD Studio Deluxe 5 (rev 5.2.2)

Unlike the other suites we review here, MyDVD Studio Deluxe began life as a DVD-authoring system, not a CD-burning application. So it makes sense that this remarkably easy-to-use package has the most polished authoring module and best-performing MPEG encoder in the roundup.

What is surprising is that savvy design and a slick interface don't in this case equate with flexibility. Sonic's DVD creation modules were designed for newbies who want to produce good-looking discs quickly without worrying about what goes on under the hood. These modules meet these goals with aplomb, but more experienced users looking for finer control over their video productions will be discouraged by the program's emphasis on presets, templates, and canned content.

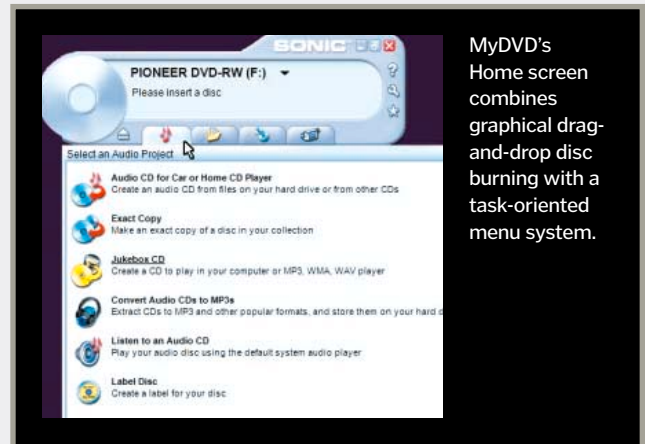
Despite its name, most of MyDVD Studio Deluxe's features are implemented in its RecordNow! Deluxe disc-premastering application. Launching RecordNow displays the suite's top-level menu, which, like a streamlined version of Nero's StartSmart launcher, fur-

nishes access to every function through a task-oriented tabbed menu system. It also displays global Help, Options, and Favorites buttons, as well as a disc icon that (like Roxio's Drag-and-Drop packet-writing utility) lets you copy files to a disc by simply dragging them to the icon from Windows Explorer.

Selecting any RecordNow! task from the menu automatically launches the appropriate component and displays wizard-like instructions and ToolTips that guide you through every step. RecordNow! has a good selection of intuitive audio and data disc creation tools and file backup capabilities that include unlimited MP3 ripping, one-click audio noise reduction, overburning controls, and support for a broad selection of file and disc formats. Disc copying is performed by a simple but easy-to-use module that sets most options automatically but lacks the ability to compress or split sources that are too big to fit on one piece of media.

Authoring tasks are performed by the MyDVD 5.2.2 component, which now has integrated video-editing capabilities. It, too, supports a superior selection of formats and can capture video to MPEG, AVI, WMV, and QuickTime files, import ASF and DivX content, and edit DVD+VR discs created by a set-top DVD recorder.

Most of MyDVD's video and authoring capabilities are designed for ease of use rather



MyDVD's Home screen combines graphical drag-and-drop disc burning with a task-oriented menu system.



Samsung i700 

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than flexibility. Its menu creation, slide show, label design, and storyboard-based video-editing modules are all easy to master, and the program is packed with intuitive drag-and-drop transitions, effects, filters, and titling tools. But it allows only rudimentary editing and lacks basic options like the ability to position menu buttons and titles manually. The program does have advanced features like the ability to edit previously created DVDs and a direct-to-disc video-recording feature, but any function that's

likely to confuse new users or complicate the authoring process has been eliminated.

MyDVD did well enough on most of our benchmark tests (for test results and an explanation of how we tested, see the online version of this story at [www.pcmag.com](http://www.pcmag.com)), but its Sonic-designed codecs won hands down on our DVD creation tests. Particularly impressive was SmartRendering, which reduces disc image creation time by ensuring that the program renders only those frames that have been edited. Sonic's implemen-

tation easily outperformed similar features in other programs, reducing the time to create a 1.2GB DVD disc image to a jaw-dropping 3.5 minutes and consistently producing what was likely the smoothest, most artifact-free MPEG-1 and MPEG-2 output in the roundup.

MyDVD Studio Deluxe also includes Sonic's CinePlayer DVD viewer application and DLA drag-and-drop packet-writing utility. But an upgrade is necessary to add system-level backup capabilities. And unlike with other suites we review here,

MyDVD lacks photo and sound-file editors.

Sonic has done a commendable job of designing a novice-friendly digital-media suite that offers just the right combination of performance, simplicity, and one-click operations. We would not recommend it to power users, but if your goal is to produce good-looking output with minimal fuss, you won't find an easier solution. ☐

Sonic MyDVD Studio Deluxe 5 (rev 5.2.2)

\$99 direct. Sonic Solutions, [www.sonic.com/mydvd](http://www.sonic.com/mydvd). ●●●●●

## Honey, I Shrunk the iPod

BY TROY DREIER

Apple blew away the competition in hard drive-based music players with its standard-setting iPod, and the industry is still playing catch-up. Now Apple is pushing the envelope again with the **iPod Mini** (\$249 direct). Sized and priced somewhere between the original iPod and less expensive, lower-capacity flash-based players, the Mini retains much of what we love about its larger sibling and one thing we don't: a premium price.

We'd seen photos of the Mini, but at 3.6 by 2.0 by 0.5 inches (HWD) and 3.6 ounces, it turned out to be both smaller and lighter than we expected. Where the original iPod is about the size of a deck of cards, the Mini is more like an Altoids tin.

The new iPod is built around a 4GB hard drive and can hold 1,000 songs. That's a far cry from the 15GB iPod's 3,700-song capacity, and that larger player costs just \$50 more, so you are paying dearly for the miniaturization.

In shrinking the controls, Apple relocated the iPod's four buttons, placing them underneath the scroll wheel (now called the Click Wheel). This not only saves space, it also makes the player easier to work using just a thumb—an enhancement we hope the iPod

picks up. The LCD display has shrunk from 2 inches diagonally to 1.7 inches, which produces a tighter but still readable six-line display.

We got 7 hours 45 minutes of battery life, right in line with Apple's claim of 8 hours. Alas, as with the original, the battery is not user-replaceable and will eventually (after a few years for typical users) stop holding much of a charge. Apple has started a replacement service (\$99) for iPod owners, and third parties can handle the swap as well (typically for around \$50).

Unlike the "any color as long as it's white" iPod, the Mini comes in five metallic colors and has a smudge-proof, anodized aluminum body that should be more resistant to dirt and grime. The Mini ships with a simple belt clip instead of the protective case/belt clip of the iPod and also lacks the wired remote. It comes with both a FireWire and USB 2.0 cable and can charge over the USB connection—an iPod first.

The Mini comes with iTunes 4, Apple's excellent music management software. Syncing with either a Mac or Windows PC is easy, and you can view your library by song, playlist, artist, or



album. The Mini can also store contact and date book info and comes with four preloaded games (Brick, Music Quiz, Solitaire, and Parachute). The iTunes utility's tight integration with Apple's iTunes Music Store is another strong point. Songs typically sell for 99 cents each; albums are \$9.99.

The Mini's 25-minute skip protection worked flawlessly during a jog, and the \$29 neoprene arm band held the unit securely. We were less impressed with the \$39 in-ear headphones. They do come with three different-size caps for the best possible fit, but their sound is shallow, light, and completely lacking in bass. The standard included iPod ear buds sound much better.

The Mini is as much of a pleasure to use as its big brother and even better dressed. The only question is whether Apple has gotten greedy. The Mini is priced considerably higher than a typical flash-based player, and it costs \$50 more than the Creative Nomad MuVo 2 (which is based on the same 4GB drive). Of course, the iPod seemed similarly overpriced when it launched, yet its superior style and performance found plenty of takers.

Apple iPod Mini

\$249 direct. Requires: FireWire or USB 2.0 port; Mac OS X 10.1.5 or later (Mac OS X 10.3 or later recommended) or Microsoft Windows 2000, SP4, or XP. Apple Computer Inc., [www.apple.com](http://www.apple.com). ●●●●●



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# Watch Your Home or Business from Afar

BY CRAIG ELLISON

Now that you've got that great new wireless network set up (see "Home Networking: From the Ground Up" in this issue, page 91), you'll want to make the most of it. One of the coolest add-ons is a wireless Webcam. Simply set it up within range of your access point (AP) and you'll be able to log on to the camera from any Windows-based PC on your local network. If you use the services of a dynamic DNS provider (such as TZO.com) and make a couple of tweaks to your router/firewall settings, you'll also be able to view the camera from anywhere on the Internet.

## D-LINK SECURICAM DCS-5300W INTERNET CAMERA

The D-Link SecuriCam DCS-5300W Internet Camera (\$380 street) functions with any 802.11b-compliant network. The one-quarter-inch CCD sensor delivers good low-light performance, and the glass lens ensures a relatively sharp image. It also has a built-in microphone.

Initial configuration is easily accomplished via the wired Ethernet connection using the camera's built-in Web server. When you first connect to the camera, you are prompted to download the ActiveX control that lets you view the camera image. Wireless settings include SSID and WEP; WPA is not supported.

The camera pans 270 degrees

and tilts 90 degrees. Video resolution can be set to either 320-by-240 or 160-by-120. You can program up to 24 preset positions and include any or all of them in the Auto Patrol feature (where the camera cycles through a set routine to give you a sweeping view of an area). The included software lets you view up to 16 cameras and record images to your hard drive.

Additionally, you can configure up to three windows within the video frame to detect motion. If motion is detected, the camera can be set to send

The D-Link SecuriCam Internet Camera is easy to configure.



images via FTP or e-mail—in theory, at least. On our tests, FTP worked properly, but we were unable to e-mail snapshots automatically from the camera.

sor, delivered outstanding image quality that surpassed the others. The camera can also be used outdoors. Its rated operating range for temperature (-4° to +122° F) and humidity (up to 90 percent) make it suitable for all but the most extreme environments.

The IK-WB11A supports resolutions ranging from 160-by-120

The rugged nature and superior images make the IK-WB11A suitable for business owners who need to see what's going on.

**Toshiba IK-WB11A Wireless Network Camera**

\$599 list. Toshiba Imaging Systems Group, [www.netcam.toshiba.com](http://www.netcam.toshiba.com).



## VEO WIRELESS OBSERVER

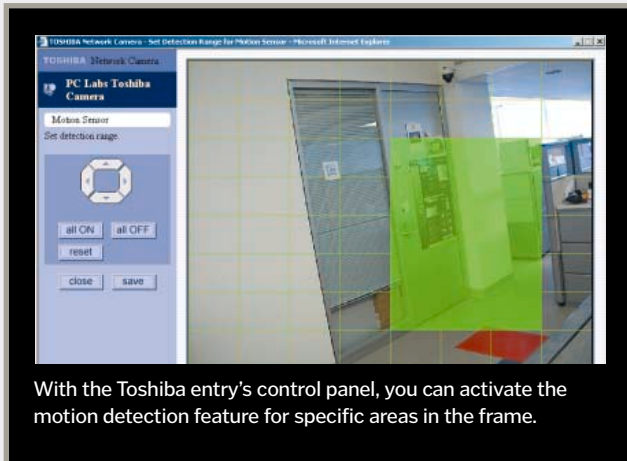
At \$280 street, the Veo Wireless Observer delivers a lot for a little. The handy utility lets you steer your camera remotely using your Web browser, and you have a choice of three resolutions (up to 640-by-480). The camera also offers 2X digital zoom.

You perform the initial configuration using the setup program and a serial cable. This is a bit of an annoyance, since virtually all other cameras allow configuration using a browser. And unlike the others we reviewed, the Wireless Observer does not include a wired Ethernet port. The Wireless Observer has a built-in microphone for sending audio along with the picture, or you can connect an external mic (which sounded much better on our tests). If bandwidth is a consideration, you can disable the audio. Another handy feature is the ability to record a video clip and save it as an AVI file. A \$40 infrared motion detector will let you send photos when motion is detected.

The odd configuration aside, the low price and unique feature set of the Wireless Observer make it a compelling choice.

**Veo Wireless Observer**

\$280 street. Veo, [www.veo.com](http://www.veo.com).



With the Toshiba entry's control panel, you can activate the motion detection feature for specific areas in the frame.

to 1,280-by-960. It delivers 112 degrees of pan and 54 degrees of tilt, plus a 5X digital zoom control. It's based on 802.11b technology and supports WEP but not WPA.

As with the D-Link camera, the included utility lets you set a defined area of the frame in which to detect motion. Motion (or input from external sensors) can trigger e-mail notification (with or without pictures) or an FTP upload of pictures.

Configuration could have been more straightforward. No software was supplied with the camera; the quick-start guide directs you to download the Camera Finder application from Toshiba's Web site and the latest version of Java 1.4.2.x from [www.java.com](http://www.java.com).

## TOSHIBA IK-WB11A WIRELESS NETWORK CAMERA

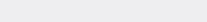
The Toshiba IK-WB11A Wireless Network Camera, with its half-inch CCD sen-

With remote steering and three resolutions, the Veo delivers a lot of useful features.

But that's our only complaint.

D-Link SecuriCam DCS-5300W Internet Camera

\$380 street. D-Link Systems Inc., [www.dlink.com](http://www.dlink.com).





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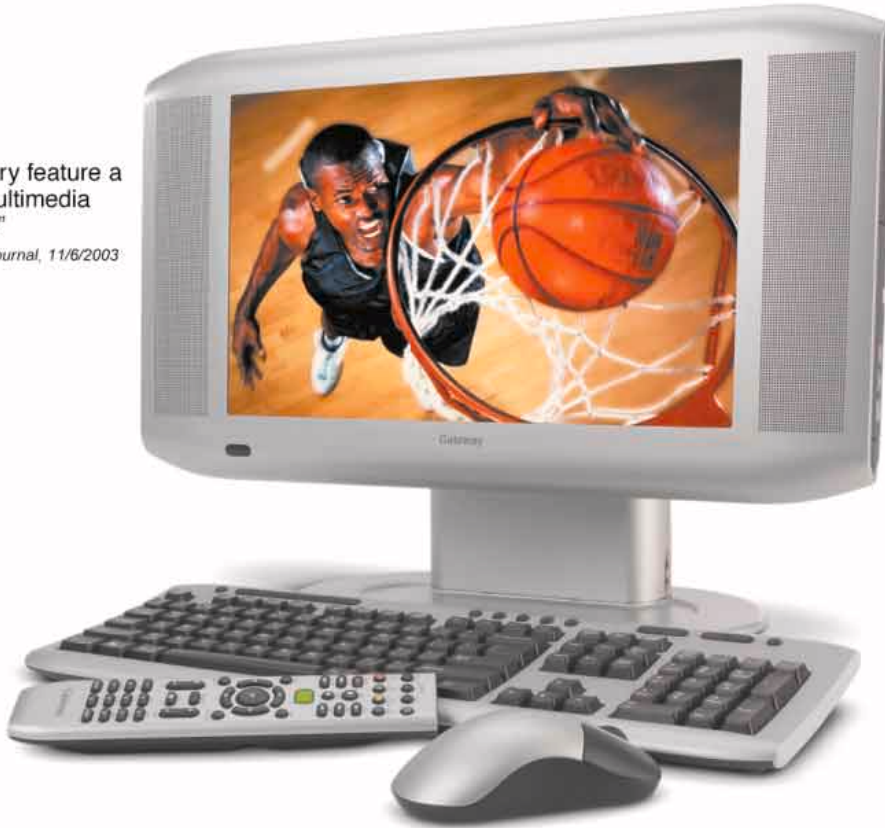
MSN Shootout

MSN Messenger

# Who says PCs can't be productive and fun?

"It has about every feature a power user or multimedia lover could want."

-The Wall Street Journal, 11/6/2003



Gateway recommends Microsoft® Windows® XP Media Center Edition.



Fits almost anywhere - thin as an LCD



Room-rattling sound with Integrated Subwoofer

## The Gateway® 610 Media Center PC

Starting at under \$1,500, the 610 Media Center PC combines home entertainment and home computing in a revolutionary new way. While it's quite capable of all the computing basics you've come to expect from Gateway PCs, it can also play DVDs, record and replay live TV, store thousands of CDs and play them on its high-fidelity speakers. It even organizes, displays and e-mails your digital photo collection.

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# A Music Player Plus

BY BILL MACHRONE

**A**rchos was one of the first to offer a hard drive-based music player, and the company is pushing the envelope again with the **Archos Gmini 220**. This competent 20GB music player can also serve as a way to store, transport, and view (albeit in black and white) your digital photos when you're away from your PC.

The Gmini (pronounced "Jiminy," as in Cricket) is dominated by a 2.5-inch (diagonal) screen. The slim, squarish device measures 2.7 by 3.1 by 0.9 inches (HWD) and weighs just 6 ounces (about the same as an Apple iPod).

Music playback quality is excellent. The player supports both MP3 and WMA files at bit rates up to 320 kilobits per second (Kbps). We detected no skips while walking or running with the Gmini, though we occasionally encountered pauses of 2 to 3 seconds while the player's hard drive spun up and located a given song or playlist. We measured continuous-play battery life at 7 hours 45 minutes. That's good but still shy of the 9 hours we saw from the iPod.

The Gmini 220 can rip a line-level or S/PDIF source directly to MP3 at up to 192 Kbps, and it can record using its built-in microphone. On our tests, the Gmini's recording fidelity with the built-in microphone was surprisingly good but marred by a mosquito-like whine picked up from the spinning hard drive. To avoid this, consider hooking up an external microphone.

Navigation using the menu and four-way rocker buttons is straightforward, but it takes a back seat to the iPod's ease of use. And the included MusicMatch jukebox software makes ripping, downloading, and managing music simple.

The Gmini also serves well as a media storage device. When you plug it into your computer, it appears as a USB hard drive, and transfers via USB 2.0 are lightning-fast. You can also off-load images from your digital camera with the company's \$39.95 memory card reader, so you don't have to take a laptop on vacation.

The unit is not as good for viewing photos as are color screen-equipped (and admittedly more expensive) media players such as the Panasonic

SV-AV30 (\$399 list) or the Archos Video AV 120 (\$379.95 direct). The 16 gray levels of the low-contrast monochrome screen don't come close to making up for the lack of color.

Still, if you're looking for a music player that can also serve as a place to dump your digital images until you get back to your PC, the Gmini 220 is a good choice. Think of the photo-playback feature as a convenience, not a selling point.

**Archos Gmini 220**  
Street price: \$330. Archos Inc.,  
www.archos.com. ●●●●●



The Archos Gmini 220 features a roomy 2.5-inch LCD for its icon-based user interface.

# Prints on-the-Go

BY SALLY WIENER GROTTA AND DANIEL GROTTA

**D**esigned for road warriors who need to print both text and photos away from the office, the **Canon i80 Color Bubble Jet Printer** can fit in a large laptop bag along with your portable PC. It's quiet, versatile, and at 4 pounds, easy to take along.

The 2.0- by 12.1- by 6.8-inch (HWD) plastic housing has a cover that curves down over the front for transport. When raised, the cover doubles as the input tray and can accommodate 30

sheets of regular paper or 10 sheets of photo paper.

For true portability (and use on a plane or in a parked car, for example), Canon offers an optional \$99 snap-on lithium ion battery as well as a \$139 kit that bundles a rechargeable battery with a charging cradle.

The i80 also has a built-in IrDA port, a port for directly connecting any PictBridge-compliant digital camera or camcorder, and an optional \$79 Bluetooth interface.

Setup is not difficult but does require a number of steps: You snap in the printhead and ink cartridges; install the driver, software, and instruction manuals on your PC; align the printhead; select the paper type and print quality; and set a number of parameters, such as borderless or duplex printing.

The interface provides lots of con-

trols and options for customizing output, though this may intimidate some users. The i80 uses a four-color, two-cartridge ink system. It delivers a maximum resolution of 4,800 by 1,200 dpi. Canon claims yields of 185 standard-quality text pages per cartridge, which would come to 3 cents a page.

The i80 prints at a respectable rate. On our tests, it managed 8 pages per minute for text at standard quality and 2 ppm for text at the best quality. Color 4-by-6 photos took an average of 1 minute 25 seconds, and 8.5-by-11 enlargements averaged 3 minutes 16 seconds per. That's more than a minute faster than the i80's predecessor, the i70, did on the same tests last year.

Print quality is very good. Text is clean and well-formed, although not very dark. Photos are attractive and have good color, especially when printed using Canon's auto photo-optimization setting. But we found that the tiny, adjustable paper guide sometimes lets letter-size paper feed askew.

The i80 is a formidable executive tool. It won't replace a high-quality desktop ink jet in your office, but it sure beats bringing one of those on the road.

The 4-pound Canon i80 is just 2 inches thick, which lets you slip it into a laptop bag.



**Canon i80 Color Bubble Jet Printer**  
List price: \$249.99. Canon U.S.A. Inc.,  
www.usa.canon.com. ●●●●●

# Toshiba's Well-Priced Multimedia Notebook

BY BILL HOWARD

While the **Toshiba Satellite A45-S250** breaks little new ground in the world of desktop replacement notebooks, it is worth more than a passing glance. For a reasonable \$1,649 direct, you get a system more powerful than most year-old desktop PCs—and a multifunction DVD burner drive to boot.

Our test unit is near the top of the price/features chain for this line, which ranges from \$1,049 to \$1,669. The 2.3- by 13.2- by 11.7-inch (HWD) A45-S250 is meant for occasional mobile use, given a 7.6-pound system weight that balloons to 9.2 with the AC adapter.

The notebook includes a dedicated SD card socket for uploading digital images, and it has stereo speakers with SRS TruSound—impressive for a portable PC. The 15-inch screen is fine for one or two viewers but fades for those who are too far

off-center. The XGA (1,280-by-1,024 resolution) is a mixed blessing: The dot pitch is coarse, but the fonts are big enough to see regardless of your eyesight. This line offers no SXGA+ (1,400-by-1,050) option, and video comes from an Intel 852GME graphics chipset, which shares system memory. A serious gaming machine this is not.

Performance on our mainstream application tests was good: 15.5 on Business Winstone 2004, 19.2 on Content Creation Winstone 2004. The unit's complex power-saving schemes helped deliver 6 hours 13 minutes of runtime on our BatteryMark test. Oddly, the machine's built-in 802.11g wireless chipset had trouble delivering "g"-like speeds with our access point; it delivered throughput more in line with slower 802.11b machines.

In our breakout of the multimedia rating, the A45-S250 wound up with only two and

The Satellite A45-S250 is a good choice for those who need a multimedia machine on a budget.

three stars because it's short on software. The ArcSoft photo-imaging suite that comes preloaded is just a 15-day trial version, which gets no credit in our scores. For DVD editing, the bundle includes ArcSoft Showbiz. You'll also find the useful Microsoft OneNote note-taking program along with the entry-level Microsoft Works and Drag'n Drop CD+DVD burning software.

Not every notebook is a superstar. Sex appeal with the A45-S250 begins and ends with the vibrant North Blue Metallic lid. But the system is reasonably priced, and you'll appreciate the DVD multiride.



Toshiba Satellite A45-S250

With 2.8-GHz Mobile Pentium 4, 512MB DDR SDRAM, 60GB hard drive, DVD±RW drive, 15-inch XGA LCD, 10/100 Ethernet, 802.11g wireless, Microsoft Windows XP Home, \$1,649 direct. Toshiba America Information Systems Inc., [www.toshibadirect.com](http://www.toshibadirect.com).

OVERALL ●●●●●

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# Fujitsu's Multimedia Heavyweight

BY BILL HOWARD

Looking for a desktop replacement multimedia notebook where the emphasis is more on *desktop replacement* and *multimedia* than *notebook*? If so, then the husky **Fujitsu LifeBook N5010** is worth a look. You'll be dazzled by the bright 16-inch LCD more than you'll fret over the weight.

At 1.7 by 14.0 by 11.9 inches (HWD) and 9.8 pounds (11.4 pounds with AC adapter), the N5010 has room for a 4:3 16-inch SXGA+ (1,400-by-1,050 resolution) screen. It has a glossy, not matte, surface with an effective antiglare coating that Fujitsu calls CrystalView. Combine that with 350 nits of brightness (a lot for a laptop) and

you've got an excellent panel for most things multimedia. Gamers and videographers would prefer to see a display refresh rate faster than this panel's 50 ms, however.

Multimedia hardware is plentiful, including a combo Memory Stick/SD card slot and a DVD-RW drive. Software is mostly bring-your-own (aside

With its 16-inch screen and DVD burner, the LifeBook N5010 is a capable desktop replacement.



from CyberLink WinDVD 4 and WinDVD Creator 2, plus the low-end Microsoft Works office suite), which holds the unit back in our ratings compared with the widescreen multimedia portables from HP and Toshiba.

Performance from the 3.0-GHz Intel Pentium 4 and ATI Mobility Radeon 9600 was good, and right in line with that of other desktop CPU-based Überportables: 15.3 on Business Winstone 2004 and 18.4 on Content Creation Winstone 2004. Battery life was 2 hours 18 minutes; again, typical for a machine of this class. Wireless performance from the

802.11g chipset was excellent, as the N5010 held a usable signal all the way out to 160 feet.

The upward-firing stereo speakers are to the left and right of the keyboard and deliver good-for-a-portable sound quality, though gamers and music fans will want to add external speakers. The volume control could be considered a gimmick: a continuously rotating knob nearly flush with the keyboard deck, eight volume indicator lights, and no mute button.

But the screen is the main attraction here. You're not likely to find better in a portable at any weight.

Fujitsu LifeBook N5010

With 3.0-GHz Pentium 4 CPU, 512MB DDR SDRAM, 80GB hard drive, DVD-RW drive, 16-inch LCD, ATI Mobility Radeon 9600 graphics, 10/100 Ethernet, 802.11g wireless, Microsoft Windows XP Home, \$2,199 direct. Fujitsu Computer Systems Corp., <http://us.fujitsu.com/computers>.

OVERALL ●●●●●

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\*Leading stand-alone, branded monitor by sales (CRT and LCDs combined); iSupply/Stanford Resources Monitrak® and Flat Panel Monitrak® 3Q03 report). Specifications subject to change without notice. Corporate names and trademarks stated herein are the property of their respective companies. Copyright © 2004 ViewSonic Corporation. All rights reserved. [11507-02E-12/03]

# Make Data Clear with Crystal Reports

BY RICHARD V. DRAGAN

Crystal Reports has long been synonymous with enterprise database reporting, and the new **Crystal Reports 10 Advanced Developer** remains true to that legacy. This package delivers an impressive array of reporting options as well as strong cross-platform abilities for both developers and server administrators.

The Advanced Developer's Windows-based designer tool is a highly visual environment that lets developers connect more easily to disparate database sources. There is good wizardry here, with easy access to advanced features such as cross-tab and OLAP reports.

Once a report is defined, it can be reused across the Crystal Reports product line. And unlike the new Microsoft SQL Reporting Services tool, end users

can still create standalone client-side reports. Charting options are also strong. From a developer's standpoint, Crystal Reports 10 plays well with others. It offers support for .NET APIs as well as Java—a signifi-

cant plus for organizations running both platforms.

The Advanced Developer bundle also includes a five-seat license for the company's server-side solution, Crystal Enterprise. Half a dozen tools and utilities

help a database administrator gain good control of the processing and distribution of reports. You can set permissions by users and groups, coordinate job processing, tune performance, and deliver reports to end users via e-mail and by hyperlink.

The Web-based UI takes care of many aspects of report administration from a single console, a kind of one-stop solution that is appealing. Within the tool, administrators also are able to move reports between platforms.

For developers, administrators, and, ultimately, end users, the latest Crystal Reports has a lot to offer. It's still a powerful reporting package, and one that has moved well into the enterprise with impressive cross-platform deployment options.

Crystal Reports 10  
Advanced Developer

Direct price: \$1,995. Business Objects, [www.businessobjects.com](http://www.businessobjects.com). ●●●●●



The Web-based administration console in Crystal Reports 10 lets you control virtually every aspect of reporting on your server and delivers easy access to performance metrics.

# Free Reporting for Microsoft SQL Shops

BY RICHARD V. DRAGAN

Database administrators and programmers working on the Microsoft SQL Server platform have had to turn to other tools (such as Crystal Reports; see our review on this page) for their reporting needs. But with the arrival of **Microsoft SQL Server Reporting Services**, Redmond finally has a reporting tool to call its own.

With good customizability and a strong enterprise focus for publishing reports to users over the Web, this solution leverages the strengths of the Windows server platform very well. Reporting Services doesn't offer the cross-platform capabilities of the class-leading Crystal Reports, but the price is right: free for SQL Server 2000 users.

You need a current SQL Server license to install Reporting Services, but multidatabase en-

terprises will be happy to learn that the tool lets you design reports for any OLEDB- or ODBC-compliant database, not just SQL Server. We tested with a variety of data sources, including Oracle, with good success.

For distributing reports, you'll need a .NET-ready installation of Windows IIS. The installer takes care of setting up virtual direc-

tories and .NET components to add reporting capabilities to your server. You'll also need your own copy of Visual Studio .NET for designing reports; unlike Crystal Reports, there is no separately included development environment for this. That said, creating reports within VS .NET is a nicely visual process, and Microsoft has done its homework by ensuring that you don't need to program to design reports.

First, a query builder (reminiscent of Microsoft Query in

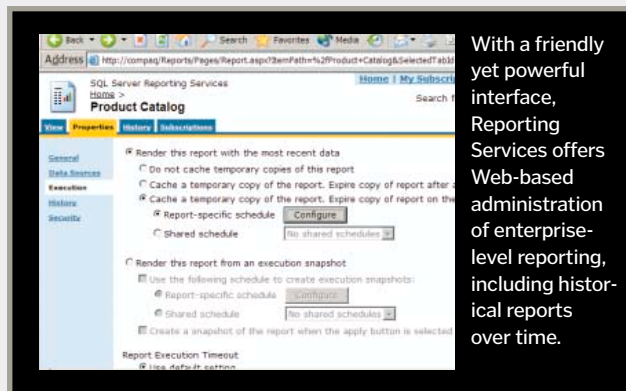
Excel) simplifies creating queries against your data sources. You then design reports in layout mode using a handful of controls that can be placed on a report surface by dragging and dropping from your available fields. A preview mode shows how your report will look.

The package features excellent charting abilities, and you can use many Excel-like macro functions to add calculations to fields. Another nice touch: By dragging and dropping the appropriate controls into the form (no coding required), developers can give end users the ability to search reports and perform other basic interactive tasks easily.

Overall, SQL Server Reporting Services is worth a look. Nearly the only limitation is that this is a Web-only solution. But you can't beat the price.

Microsoft SQL Server  
Reporting Services

Free with Microsoft SQL Server 2000. Microsoft Corp., [www.microsoft.com](http://www.microsoft.com). ●●●●●



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**Camera Case** for Nikon Coolpix Digital Camera Model# 5453



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**Digital Imaging Kit** Model# 200855



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## Quick-Draw LCD Hits 12 ms

BY ALFRED POOR

**T**he Samsung SyncMaster 172X is a sleek, 17-inch LCD monitor that has some attractive features but not a lot of extras. You do get analog and digital connections and good image quality—albeit at a premium price.

The monitor has a surprisingly narrow bezel, and the angled, hinged stand adds to the panel's slim, lightweight design. The tilt and height adjustments are adequate but have a shorter range than those of other LCDs. The power, analog, and digital cable connections are readily accessible in the back of the base, and both analog and digital cables are included.

The small gray control buttons arranged along the bottom of the panel have tiny embossed

icons that are nearly impossible to see under normal lighting conditions, and the on-screen menu system is a bit more awkward to use than those of some LCDs. Fortunately, the monitor comes with Samsung's MagicTune, which lets you make screen adjustments from your computer. The utility is supposed to work with analog or digital connections, but we discovered in our testing that it may not work with digital signals from older graphics cards.

Image quality is good. Color tracking and brightness uniformity are fine, and there were no apparent pixel defects. Color ramps are generally smooth, but we saw some slight banding when using a digital connection, and the panel's response at the darkest gray levels is weak,

especially with a digital signal. MagicBright lets you adjust the screen for different applications, such as text editing or Web browsing.

Samsung claims a 12-ms response time for this monitor, though this is based on the industry-standard black-white-black cycle. According to a company representative, switching between shades of gray can take up to three times as long. Motion on the monitor looked better than average but not as crisp as on a CRT.

The SyncMaster 172X doesn't have extras such as speakers or USB ports. The thin bezel, PC-based configuration utility, and faster response times are all assets, but other monitors perform about as well and cost less.



The Samsung SyncMaster 172X has a thin bezel and fast response times.

### Samsung SyncMaster 172X

Street price: \$650. Samsung Electronics America Inc., [www.samsungusa.com/monitor](http://www.samsungusa.com/monitor).



## Web Surveys For the Enterprise

BY NELSON KING

**I**nquisite Corp. has staked out its territory as the premier Web survey tool for the enterprise, and the company defends its position well with its latest version, **Inquisite 6.0**. This is not an inexpensive product: Licenses range from \$6,000 (single user) to \$60,000 (corporate). But important new features, such as survey prepopulation, a response editor, and survey sharing, enhance an already smoothly integrated package.

Inquisite concentrates on the management needed for large-scale surveys, helping an administrator coordinate survey invitations, response data, and reports. It is worth noting that many survey programs, such as Apian's Survey Pro, cast a wider net by including other survey channels, such as mail or phone.

As we did on our tests, many

users will install the Inquisite Survey Builder on a local computer to develop the surveys and then post them to Inquisite's secure servers. For more direct control, try Inquisite's server version. Users take the surveys with a Web browser; results are posted to a database that is administered and analyzed online.

Inquisite distinguishes itself with flawless integration of each phase of operation, such as with one-click survey publishing. Also notable is how easily you can create sophisticated surveys. The program provides the usual battery of question for-

mats, libraries of responses, and a better-than-average template system to improve survey appearance. Inquisite also supports more advanced survey options, such as multiquestion tables, data piping, and data validation. Other survey programs (namely Web Surveyor) do more hand-holding, but Inquisite has more than enough tutorial and support materials for most people.

A cure for a common survey taker complaint ("They already know who I am, so why do I have to type in so much information?") is handled by In-

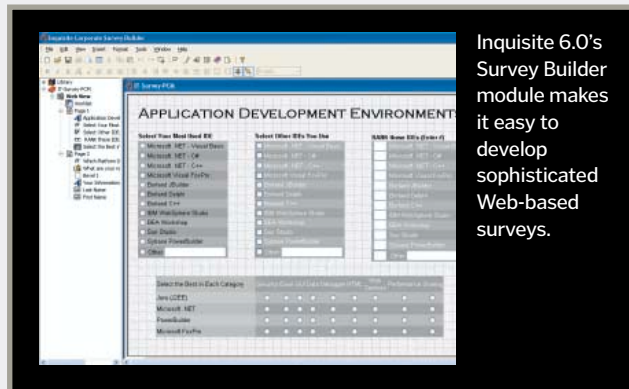
quisite's prepopulation feature. Given a unique identifier (name, number), an Inquisite survey form can prefill with a survey taker's pertinent data. Inquisite's prepopulation tool has loads of potential, though fill data is uploaded using a text file, which is not particularly scalable.

Other welcome additions include an editor for survey responses and the ability to securely share results (reports, graphics) with others. The company has also made significant improvements to the reporting and administration of surveys, an area often neglected in other survey software.

Companies have found that Web surveys work, which explains the explosion of survey software in the past year. Inquisite 6.0 faces stiff competition, but its new data features, enterprise orientation, and "no loose ends" quality can provide invaluable information.

### Inquisite 6.0

Direct price: Single-user license, \$6,000; corporate (30 users or more), \$60,000. Inquisite Corp., [www.inquisite.com](http://www.inquisite.com).



Inquisite 6.0's Survey Builder module makes it easy to develop sophisticated Web-based surveys.

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# Ready, Click, Present

BY ROBERT P. LIPSCHUTZ

**S**onic Foundry was a well-known and well-respected developer of multimedia tools, so it came as a bit of a shock when it sold off its consumer software lines. What the company kept—its video- and audio-encoding patents and know-how—form the basis of **Mediasite Live ML**, Sonic Foundry's enterprise

on a separate server) to stream a synchronized presentation to participants. The server takes input from any video graphics array device. While most presenters will bring a PC to display PowerPoint data and the like, they can also choose to hook up a document camera or other device. The player leverages Microsoft Media Player software,

click operations, conduct the Q&A and polls, and make sure all slide transitions are working.

That said, we would prefer to have these operations done from a single Web application. As it is, you have to start and stop presentations from the local capture machine. Other functions are handled in the intuitive, Web-based presenter console.

With no added difficulty, presenters can record a live presentation for later use. The session can be saved onto a CD, published on the Web, or archived for posterity. Mediasite Live transparently publishes the presentation and makes it available in a Web-viewable catalog. For on-demand viewing, the Slide List screen provides thumbnails so that viewers can quickly navigate to slides of interest and play the presentation from there. In both on-demand and live modes, slides can be maximized for easy viewing.

Presenters should be aware of some PowerPoint guidelines when using Mediasite Live. For example, it's best to use high-contrast slides: We found that some text and background color choices that worked for the human eye gave Mediasite Live trouble at the default sensitivity settings. Also be aware that those cool fade-ins, as well as some other whiz-bang PowerPoint transitions, won't have the same effect in Mediasite Live.

Mediasite Live is a good choice for those looking to create live and canned presentations simultaneously. Those who just need to make on-demand presentations may find that a product like Anystream's Apresso,

which works as a Microsoft PowerPoint add-in, can do the job nicely and at a much lower price.

Our current Editors' Choice among Web conferencing services, WebEx Meeting Center ("Take a Meeting Online," January 20), is fine for real-time presentations and goes beyond Mediasite Live's offerings by including application and desktop sharing. But WebEx can be more difficult to use, with a fair amount of post-production work necessary to produce on-demand presentations. Also, for both Web conferencing and videoconferencing solutions, per-use costs can add up quickly. With Mediasite Live, once you own the system, the only additional cost of note is the incremental storage needed to archive sessions.

In sum, Mediasite Live succeeds in its goal of making high-quality live and on-demand presentations easier and more accessible to businesses. Excellent video quality, good interactivity, simplified publishing, and ease of use make this a worthwhile tool.

## Mediasite Live ML

Direct price: \$24,950. Sonic Foundry Inc., [www.sonicfoundry.com](http://www.sonicfoundry.com).



The Mediasite Live Viewer lets participants view synchronized audio, video, and presentations.

conferencing appliance.

Companies often need two types of conferencing services: one to handle live broadcasts to a mass audience (say, an address from the CEO), and one for archived sessions (say, for training) that can be delivered on demand. Most tools on the market serve only one of these scenarios well. Mediasite Live tackles both. It can serve up a live, interactive, Web-based broadcast while also letting users replay a stored session. Best of all, canned presentations don't need post-production encoding to make DV content accessible via the Web, since Sonic Foundry's hardware handles it on the fly.

To create a live presentation, speakers need only bring their presentation material, plug into the capture device, click the Start button, and begin speaking. Mediasite Live works with Microsoft Media Services (installed

and a wide variety of encodings can be selected for both Windows and Mac OS endpoints.

Participants will view the streamed presentation in a Web-based viewer that integrates audio, video, and data. The Mediasite Live portion of the software is downloaded automatically within the browser. For live presentations, the speaker can introduce polls and display poll results, and participants can use the integrated Q&A tool to ask questions in real time.

Although Sonic Foundry says that an individual could use its product without assistance, running the capture console while making a presentation is difficult. We found it helps to have a second person in the room to run the show. The good news is that your helper does not need any special AV skills. An assistant can stop and start the capture process using simple one-



The Mediasite Live ML appliance has all the hardware and software needed for live or canned presentations.



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# FEEDBACK

**“24/7 computing, peer-to-peer connections, instant messaging, hidden file extensions, open IP relays, and remote script execution are all root causes of the virus and spam epidemic, yet they’re all enabled by default.”**



## DVORAK: DOOMSAYER

IN JOHN C. DVORAK'S COLUMN of February 17 (page 51), he points out how ease-of-use features have become ease-of-abuse features. "Who thought this was a good idea?" he asks. Think back to 1995 when Microsoft released Windows 95 and Office 95, which included the VBScript macro language. Columnists everywhere were complaining that this new macro language was capable of delivering embedded code that could damage remote computers without any action on the part of the user. Microsoft responded that it would pop up a warning to the user before running any macros. So here we are, nine years later, and these remote scripts and macros are wrecking computers all over the world.

24/7 computing, peer-to-peer cable modems, instant messaging, hidden file extensions, open IP relays, and particularly remote script execution are all root causes of the virus and spam epidemic, yet they're all enabled by default. Those functions should all be off, and users should have to apply for a license to turn them on. The Windows OS and IP infrastructure are designed to fail, and it's up to IT professionals and users to patch together workable systems.

MIKE HENRY

COOKIES ARE NOT EVIL! Tell me that John C. Dvorak did not write: "Who ever thought that browser cookies were a good idea? I'm not even sure they're legal: I was under the impression that hacking was against the law."

I always thought Dvorak was tech-savvy, but this column, filled with vague paranoia and obvious misconceptions, makes me wonder. Cookies are a legitimate and indispensable way to bring state to a stateless Internet. Online shopping would be virtually impossible without cookies, as would many other online services that we all take for granted. To imply that cookies are the diabolical tools of hackers is just silly ignorance.

Cookies are nothing more than tiny text files managed and controlled by the browser. A cookie can't execute or harm anything, and the browser prevents Company A from reading Company B's cookies. I hope Dvorak will do his homework next time; it hurts his credibility when he doesn't.

NATHAN G. JENSEN

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## SMART PHONE TRUMPS SMART WATCH

MICHAEL J. MILLER (Forward Thinking, February 17, page 5) touts a watch that tells you the weather and headlines and automatically adjusts time zones. My cell phone already does all that. Don't get me wrong: I've owned a Timex Data Link since they first came out, but I hardly ever look at the Outlook contact information on

my watch anymore, because my cell phone already holds more data.

BARISTA BOB

## VISIT YOUR LOCAL LIBRARY SITE

MY WIFE AND I are both librarians, and one of our pet peeves is that articles like "Your Library Online" (Solutions, February 17, page 56) usually appear in places like *American Libraries*—where nobody sees them! Thank you for getting this story out where it needed to be read.

MATTHEW R. MARSTELLER

## E-MAIL SERVICE GETS THUMBS-UP

THANKS SO MUCH FOR THE SIDEBAR "Servers or Service" in the story "E-Mail Servers" (February 17, page 88). I tried eOutlook based on your listing, and the service is exactly what I have been looking for—an easy way to transfer my domain e-mail services by changing my DNS MX record instead of giving up my full DNS record. eOutlook was easy to set up and its customer interface very well-designed.

MIKE KNOWLES

## CALIFORNIA BITES BACK

I FOUND JOHN C. DVORAK'S column "Getting It" offensive (February 3, page 57). His rant crossed the line from commentary to cultural bashing. According to Dvorak, Californians are nothing but trend-crazed, self-actualized, drug-snorting crackpots who are gullible enough to believe there's money to be made on Internet companies. While many businesses failed during the dot-com fad and blew their investors' money in the process, lambasting our good state and its citizens strikes me as sour grapes. I suspect Dvorak is still licking his wounds from some bad tech investments he made in the late nineties.

DAVID JENKINS

## Corrections and Amplifications

■ In our Coming Attractions item on Adobe InDesign CS PageMaker Edition (February 17, page 22), we listed the price incorrectly. The correct price is \$349 direct.

■ In the "Spam Blockers" section of our story "Can E-Mail Survive?" (February 17, page 79), we omitted a credit for the author, Cade Metz.

■ In the same story, SpamCatcher's company name is listed as MailShell Inc. MailShell has since licensed SpamCatcher to Aladdin Systems ([www.aladdinsys.com](http://www.aladdinsys.com)). • In addition, the screen shot on page 82 identified as Vanquish Pro is actually Qurb 2.0. The caption should read: "Qurb 2.0 adds Approve and Block buttons to your client to let you fine-tune your whitelist quickly. If mail is mistakenly quarantined, Qurb 2.0's well-designed quarantine folder makes moving it back to your in-box a snap."

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# ExtremeTech

## Machrone's Law: We're Back, Baby!

S ometime around the debut of computers sporting the Intel 486 chip, machines were being introduced at about \$5,000, which I realized was about the same as the preceding 386-based machines. Which was the same as the PC AT, a fully configured PC-XT, or the original IBM PC. That's also what I paid for my first computer: a Z-80-based system that I had to solder together myself.

Thus was born Machrone's Law: The machine you want will always cost \$5,000. Note the third and fourth words: the machine *you want*. Not the cheapest machine, not the one that makes the most sense. The one that makes you drool.

Machrone's Law held true from the birth of personal computers through several generations of Pentiums. But then operating systems and applications stopped evolving as quickly, and their otherwise-insatiable appetite for CPU cycles and memory plateaued. Economies of scale kicked in, and competition got fierce. Prices plummeted. Soon it was hard to spend \$3,000 on a computer, then \$2,000. In a recent article in the electrical engineering journal *IEEE Spectrum*, a writer revisited the laws that have governed the past two decades of computing, including Moore's Law, Metcalfe's Law, and Machrone's Law. I told the writer that apart from a few esoteric, high-end systems, Machrone's Law had outlived its usefulness.

Suddenly I was inundated by calls and e-mails from people begging to differ. No, they didn't beg; they said I was flat-out wrong. Systems, they said, are as expensive as ever, and the power you can get for 5 grand is what every red-blooded PC user really wants.

I had clearly been blinded by Dell, Gateway, and Hewlett-Packard, which have been beating each other silly over gutless \$500 machines, while companies such as Velocity Micro and VoodooPC have been selling all the \$5,000 machines they can make. Who are the customers? People who don't want to wait 2 hours to convert a DVD format. People who want to see their video edits in real time. People who don't want to lose a game because their machines don't pan around the battlefield as quickly as their competitors'. People who want to store every photo, every CD, and even every DVD locally. Visual-content creators have always lived at the bleeding edge; the more power

they have, the more magic they can work.

If you visit one of these high-end vendors' sites, run through the online configurator, and find yourself peaking out at \$4,000 or \$4,500, don't despair. You're just not thinking about all the things you could or should be doing with your PC. And be smart about your purchase: High-performance processors, video cards, and hard drives run hot. Randy Copeland, president of Velocity Micro, observed, "You could roast a chicken in there." So any time you see an option for more fans or better cooling, take it.

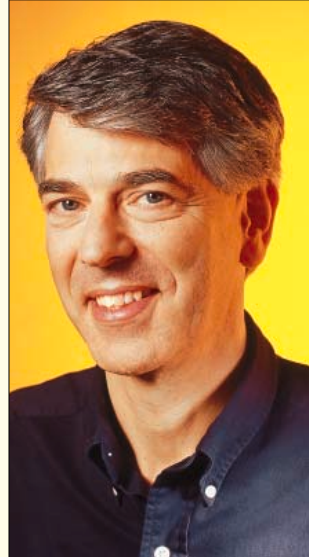
More cooling doesn't necessarily mean more noise. But quiet comes at a cost, too. Oversize heat sinks, heat pipes, and aluminum cases all help to get the heat out without making too much of a racket.

The machine you want may really be two machines, and that \$5,000 may be distributed over two boxes. No one will deny that 7,200-rpm and 10,000-rpm high-performance hard drives are noisy. As my friend Will Fastie points out, you can build a box that holds a terabyte of RAID 0 hard drives rather inexpensively and put it someplace where it won't disturb you. The SyncRAID controller is a powerful, inexpensive solution, and ABIT has recently introduced a motherboard with four SATA ports and native RAID support. Get used to the idea of a terabyte-plus server in your home. It's the future, and it's closer than you think. On the other hand, you want a box that goes in your den or living room to be silent and stylish. There's no point in bulking it up with multiple hard drives if you can put them somewhere else.

Regarding home networking, I'll bet you never thought you'd have to ask yourself, "Is 100 megabits enough?" But wired Gigabit Ethernet and ultra-wideband wireless networks are probably going to be more important to converged computer and consumer electronics applications than they are to the vast majority of businesses.

As computer systems push toward 4 GHz (a very far cry from my first 4-sMHz machine), Machrone's Law lives.

**MORE ON THE WEB:** You can contact Bill Machrone at [bill\\_machrone@ziffdavis.com](mailto:bill_machrone@ziffdavis.com). For more *ExtremeTech* columns, go to [www.pcmag.com/machrone](http://www.pcmag.com/machrone).



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# John C. Dvorak

## It's the Games, Stupid!

**P**eople talk about changing platforms. They promote Mac and Linux as vaguely better than Windows because these operating systems crash less, because they're cheaper, or because Microsoft isn't involved. Meanwhile, Windows users complain bitterly about everything. But few actually switch. Why is this? Let's look at the reasons to switch and try to determine exactly why Windows has such a viselike grip on its user base. If I am correct in my assessment, then everyone has been barking up the wrong tree for decades.

**Ease of use.** Most people agree that Macs are the easiest to use. Windows XP is hardly difficult to use, and one can expect Linux to be viable on the desktop someday. This is no longer a hot-button topic. The PC may be flaky, but nobody is running away because it is hard to use. So this notion is apparently overrated.

**Crash-proofing.** Windows users seem to think their machines crash the most. Most experts see Linux as the most stable of the three operating systems. That said, nobody except server mavens is concerned about frequent crashes to the point where people are running away from Windows and defecting to Linux. This is another wash.

**Spam.** This is a function of e-mail, not platform. The tools to fight spam are found mostly on Windows machines, but again, no one shifts operating systems because of this.

**Compatibility.** Peripheral compatibility is the big issue, with Windows leading all others. I do see some minor evidence that Windows is preferred because it works with certain hardware. Linux looks to be lagging here. So Windows has the edge, but this may skew in the direction of keeping Windows people tied to the platform, not luring others to switch.

Most file formats are compatible with each other, so that's become a nonissue. The last vestige of incompatibility seems to be compression methodologies—StuffIt versus ZIP. As for general software, the most distinctive package that would encourage a shift to the Mac is Apple's Final Cut Pro. But that is a highly specialized niche product aimed specifically at video professionals, so it cannot influence a large market segment. Again, there's no com-

elling reason to change operating-system affiliations over compatibility.

**Total cost of ownership.** Apparently nobody cares. Experts can prove that the Mac is the cheapest platform by virtue of the low cost of support and training. Linux is just plain free. I think a case can be made for any of the contenders.

**Viruses and security.** Windows suffers the most here. Almost all major problems are Windows-related on both the client side and the server side. Yet nobody is abandoning Windows for this reason; people just complain about it.

**Range of applications.** Windows has an obvious lead here despite the Mac's slight edge with multimedia. The irony of Microsoft's dominance in the applications arena is that it puts the small players out of business, which actually hurts Windows. As the applications portfolio grows on the other platforms, their market shares increase. So this seems to be the most important differentiator. But it's not making any serious dent in the Windows market share that I can see.

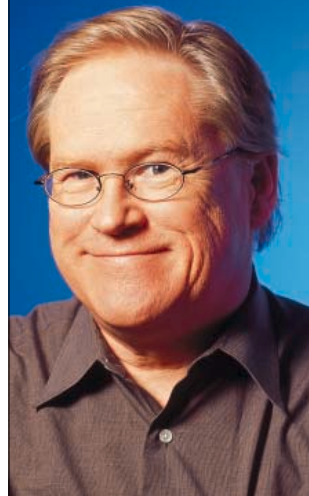
**Gaming.** I pulled this out of the general-applications category because this is the only category where Windows rocks. In fact, when I analyze the list carefully, only games stand above the rest—giving Windows a genuine edge.

When Steve Jobs first rolled out the Macintosh and eschewed games on the machine, telling people to put them on the Apple II instead, he made the biggest mistake of his life right then and there. This is the main differentiator in platform preference. PCs can play tremendous games, and there are many more to choose from than there are cross-platform titles. Families are hard-pressed not to own a PC because of the tonnage of children's games, for instance. Although Macs are easier for kids to use, children still want machines that can play the games they like.

All the wheel spinning about the superiority of this platform or that platform just boils down to the fun side of computing: games. No other single factor is so skewed. Everything else is a wash.

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**MORE ON THE WEB:** Read John C. Dvorak's column every Monday at [www.pcmag.com/dvorak](http://www.pcmag.com/dvorak). You can reach him directly at [pcmag@dvorak.org](mailto:pcmag@dvorak.org).



**When Steve Jobs first rolled out the Mac and eschewed games on the machine, telling people to put them on the Apple II, he made the biggest mistake of his life.**

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# Inside

# Track



JOHN C. DVORAK

**S**neaking In the Back Door Dept.: If you think the battle of **platforms** involves only Linux, Mac, and Windows, you're in for a **rude awakening**.

Since 1995, a group of superstars working primarily in Europe has literally **morphed** the architecture of the we-all-thought-it-was-dead AmigaOS, probably the **slickest, tightest code** ever put on a desktop computer. With seven years of clean-room engineering, the new MorphOS runs on the PowerPC chip, and literally thousands of developers worldwide are working with it. The new OS is best showcased in the PowerPC-based Genesi Pegasos computer, which runs both MorphOS and various PPC versions of Linux.

If you start digging into this, you find remnants of the old **stillborn CHRP** (Common Hardware Reference Platform), which came out of the lost Apple/IBM/Motorola alliance. IBM and Motorola are all over this new project. Buried on each company's Web site are ominous details of a MorphOS PowerPC future. Did anyone following the history of semiconductors think that IBM and Motorola were going to sit on the PowerPC after **Apple pulled the plug** on third-party Macintosh licenses?

The **new platform** will surprise people. From what I'm told, it's fully USB 2.0-compliant and plug-and-play-capable with everything out there.

The first MorphOS systems are called A-Box machines, because they mimic the Amiga. The next batch are nicknamed **Q-Box**, which is what we'll see when MorphOS hits the U.S. The Q-Box uses a somewhat mystical **Quark microkernel** for the OS, hence the **Q**. What you are reading here is about six months ahead of the wave, so make a note. From the screen shots of the OS I've seen, I have to say that it's as **jazzy** as you can get, and you can run Windows (or Mac OS X) in a separate window if you need

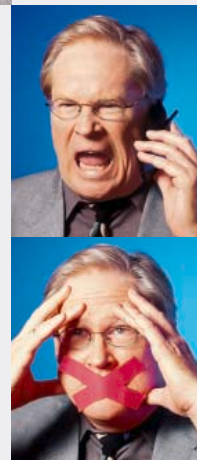
to use those pesky legacy apps.

If this machine achieves critical mass, it could **reignite the dull computer scene**. There is a **weird—even freaky—enthusiasm** about this project. It's a community-based movement, which means that everything's **free**. Tools are **free**, the OS is **free**, applications that cost money for other OSs are **free** for MorphOS. The geeks are in high gear. This is much more exciting than the **pedantic Linux** world, which can't seem to consolidate, let alone compete with Microsoft on the desktop.

It's not impossible for a new platform to emerge. Remember how Nintendo and Sega dominated the game scene for so many years after the collapse of Atari? Look at the market today: Sony owns it. Nintendo fights Sony, Sega is gone, and the Microsoft Xbox is the new challenger. And recall that the dominant platforms on the desktop were once CP/M and Apple II. As far as I can tell, Microsoft and Apple are not taking this seriously enough.

That said, I witnessed the original emergence of the Amiga around 1984, after two years of rumors. It was an **incredibly hot box** and could have been a world-beater. Instead, Amiga sold itself to Commodore, where the company lost its way and **eventually died**. Much of the intellectual property from the original box went from hand to hand and ended up at Gateway, where it's apparently **in a locker someplace**, lost, I think. This time may be different. So far, I like what I see. For more information, check out [www.morphos.net](http://www.morphos.net).

**And Now for Something Completely Different Dept.:** Have you heard the latest scheme afoot to deploy broadband to people living on the outskirts of town? Zeppelins. Yeah, dirigibles. **Blimps**. The idea is to position a bunch of blimps above rural areas with broadband transceivers hanging off them. There are actually **two harebrained plans** already in the



**A European consortium wants to float a slew of blimps to deliver broadband. Who says they don't smoke potent marijuana in Europe?**

works. SkyLinc, from York, England, wants to position **tethered blimps** 5,000 feet in the air over rural areas (with mile-long ropes?). That should be interesting in a storm.

Even weirder is the plan funded by the European Union called **Project Capanina**—the Stratospheric Broadband Initiative. (Check it out at [www.capanina.org](http://www.capanina.org).) Apparently, a huge consortium of big spenders and **dingbats** wants to float a slew of blimps at 65,000 feet (yes!) over all of Europe. I'm laughing out loud over this one. Oh, the humanity! Who says they don't smoke **potent marijuana** in Europe?

Geosynchronous satellites are **wiggling around** in orbit on a daily basis, and most have to be rocketed back into position at least once every couple of weeks. They are kept up there only as long as the fuel lasts and are eventually abandoned to float aimlessly through space or burn up on reentry.

Can you imagine positioning a **gas-filled bag** at 65,000 feet? And what happens when the fuel runs out? Do these things float around or crash into the countryside, killing cows? The parties involved in this folly would do well to remember **Dvorak's Law Number 103**: If something seems like a silly idea, it usually is. Count von Zeppelin must be rolling over in his grave.

**This thing  
stuck on my head?**

**It's not a hat.**



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# On Technology

## The New Road Warrior Toolkit

**R**egardless of what your notebook weighs, the serious road warrior's carry-on bag weighs at least 15 pounds. I've managed to reach the low twenties on long trips. Here's what's in my bag.

At the dawn of the serious road warrior era (circa 1990), I carried alligator clips to get a dial tone on hotel phones that didn't have RJ-11 cables, and I had an acoustic coupler that fit over the handset of an airport phone. Now RJ-11 dial-up is everywhere, and enough hotels have broadband that I've taken to carrying a small wireless access point. Even if the hotel offers wired broadband, I can be anywhere in the room, not just tethered to the RJ-45 jack on the desk. The ASUS WL-330 WAP (\$70 street) weighs less than half a pound with the transformer, a short RJ-45 connector cable, and a PDA-size carry wallet. It also functions as a wireless repeater and Wi-Fi adapter for non-Wi-Fi laptops.

Not that I would ever do this, but I've heard of people carrying two laptops and a wireless router from Belkin, Buffalo, Linksys, or Netgear. (The router typically weighs about 2 pounds with transformer and would go in your suitcase.) This presents just one ID to the broadband billing system and represents a minor larceny, on the order of not telling the cable company you have a second TV attached at home. It also means a coworker a couple rooms down the hall could share the connection if he or she knew the SSID and password. But that, of course, would be wrong.

On the road, I enjoy music and the occasional DVD movie, but my notebook has mediocre audio. I fixed that with the Echo Indigo (\$130 direct, [www.echoaudio.com](http://www.echoaudio.com)): a PC Card audio adapter with excellent sound, a big volume wheel, and two headphone jacks, so two people can share one DVD-playing laptop.

To keep your work private on planes and trains, get a 3M Privacy Filter (\$50 to \$60 street, depending on size), which slips in front of your LCD screen. For only a slight brightness penalty, you restrict the viewing angle to head-on.

I'm a sucker for retractable cables, because they make my bag neater. My current favorite is the Zip-Linq line (phone, Ethernet, USB, FireWire). Make sure to protect the ends of phone and Ethernet

cables with in-line couplers (try RadioShack); they make one long cable out of two shorter ones. Rather than carrying a bunch of USB cables with different tips, I use the GoldX QuickConnect kit (\$20 street), which includes a proprietary cable and enough tips to make any of the five possible USB cable combinations.

To hold the small stuff, I use a couple of bags with mesh sides, so airport security people can snoop more quickly.

Everything I carry is labeled: laptop, bags, mini-bags, transformers, and even cables. Brother and Dymo make useful custom labelers. The Dymo RhinoPro 5000 does cool things like creating flexible wire-wrap labels, and the Brother PT-1400 is very similar. Only \$100 street, each is cheap enough for almost any type-A personality (like me). Labeler tape runs \$1 a foot, so order common name-and-phone-number labels from a supply house for a nickel apiece (try [www.artisticlabels.com](http://www.artisticlabels.com)).

To cut down on transformer proliferation, look for phones and PDAs that can be recharged from your laptop's USB ports. Your PDA vendor probably supplies a USB sync cable, but Belkin and others offer \$20 sync-and-charge cables. Also, look for an AC/car/airplane transformer that has interchangeable tips for notebooks, PDAs, cell phones, and some cameras. (iGo Corp. makes one, and others are coming.) Such devices usually ship with multiple tips for popular notebooks, but the tips for cell phones and PDAs are always sold separately.

Add a small flashlight, a spare battery, a small digital camera, noise-canceling headphones, an MP3 player, a Microsoft portable mouse (and the ultrathin 3M mouse pad for use on glass hotel desktops), a couple CD-Rs for backup, spare CompactFlash and Secure Digital cards, and enough toiletries to get me through an unexpected overnight stay and it's easy to see why my travel bag is bulging. In the past, I used to put the really heavy or bulky items in my rolling suitcase. Now the heavy things go back in my shoulder bag or backpack to keep my checked bag under the 50-pound airline limit.

**MORE ON THE WEB:** You can contact Bill Howard directly at [bill\\_howard@ziffdavis.com](mailto:bill_howard@ziffdavis.com). For more On Technology columns, go to [www.pcmag.com/howard](http://www.pcmag.com/howard).



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# SOLUTIONS

## 10 Hot eBay Tips

How to get more money for your stuff on eBay.

BY DAVID A. KARP

Think of eBay as the ultimate return policy. No matter where or when you bought an item (or from which crazy relative you received it as a gift), you can turn around and sell it, sometimes for more than what you paid. The eBay marketplace is no longer a phenomenon; it's a hobby, a livelihood, and even a way of life for millions of addicts around the globe. But no matter how much

you sell on eBay, odds are you're missing a few opportunities to maximize your bottom line. Here are some tips that can help.

**Look before you list.** The most effective way to get the most money is to know your market. Before you list your item, perform a quick, title-only search on eBay for items similar to yours. Then, click on *Completed items* (under the Display heading) and sort the results by price (highest-priced first). Keep in mind that any given item on eBay is worth only what others are willing to pay for it, so ignore any listings that never received bids. Scrutinize the most successful sales and see how the sellers have described and promoted their items in order to earn top dollar.

**Price to sell.** When you're ready to list, set your Buy-It-Now price in the neighborhood of what you expect your item is worth; raise it a little for particularly in-demand or scarce objects, or take a few dollars off if you want to move your merchandise fast. Set the starting price (the opening bid) much lower, though, anywhere from a single dollar to no more than half your item's value; this will encourage healthy bidding, thus raising the perceived value and the final price. If you've done your research, you won't have to worry about your item selling for too little.

**Reserve judgment.** If you're considering a reserve price for your listings—don't. The reserve price is a secret dollar amount

below which you're under no obligation to sell, and it is useful only if you don't know the value of your item. Reserves tend to scare away bidders and accomplish nothing more than lowering the closing price unnecessarily. Even worse is the use of a

Description		
You are bidding on a spectacular model DeLorean from "Back to the Future, part I" (the good one). It features: <ul style="list-style-type: none"> <li>• Opening "gullwing" doors and hood</li> <li>• Fold-down wheels (from the end of the movie)</li> <li>• Authentic "Mr Fusion" over the engine compartment</li> <li>• Plus: capacitor, currently flashing</li> <li>• Original packaging</li> </ul>		
<b>What's Included</b> One toy car, original box, original manual	<b>Payment Terms</b> I accept PayPal and cash, in person.	<b>Shipping Terms</b> I proudly ship with the Pony Express. Shipping is fixed at \$4.00.

**WHAT'S INCLUDED** in your auction, how much shipping will cost, and what types of payment you accept should be clear.

Buy-It-Now price alongside a reserve price, as bidders easily confuse the two and give up any hope of getting a bargain.

**Spelling counts.** The success of any auction item relies almost entirely on the likelihood of its being found in searches and—to a lesser extent—eBay's category listings. eBay searches are seeded by the words you place in your auction titles, so include as many relevant keywords as possible without wasting space with unnecessary punctuation, nonsense such as "@@ Look! @@," or any other terms for which your customers won't be searching. Since eBay uses *exact-match* (as opposed to *fuzzy*) searches, the words in your titles must be

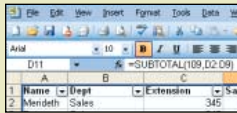
spelled correctly in order to show up in search results. But if you have the space, be sure to include some intentional misspellings (*DeLorean*, *Delorian*, or *Delorion*, for example) to accommodate your more spelling-challenged customers; just make sure the correct spelling is also there.

With only a scant 45 characters in which to work, there's rarely room to spare in an auction title. If you're inclined to highlight the condition, scarcity, or other special aspects of your item, do so in the subtitle. Although subtitles are indexed only in title-and-description searches (not the more common title-only searches), they do appear in all search results and category listings and are effective in getting extra attention. A subtitle costs 50 cents, so don't bother for any item worth less than about \$25.

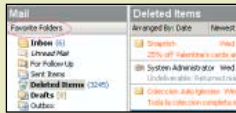
**Dress for success.** A little color and spice in your auction will not only make it more inviting and more professional-looking, it will help emphasize important details in the auction description. Among the most vital are the payment and shipping details, both of which are unfortunately buried far beneath the photos in eBay's new auction page design. The clearer, simpler, and easier to find your terms are, the less likely

you are to be hassled by confused or disappointed customers or deadbeat bidders.

**HTML: Make it look good.** A rudimentary WYSIWYG description editor is part of eBay's Sell Your Item form (Internet Explorer only), but it offers little more than basic control over the font size and appearance. For the best-looking and most feature-rich descriptions (including such niceties as in-line images, tables, and even JavaScript), you'll want to turn to your favorite Web page editor; Adobe GoLive, Netscape Composer, or even Microsoft Word will do. The problem with these applications is that they generate complete, standalone pages, not insertable HTML



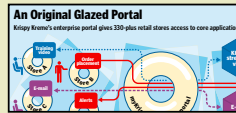
60 Office: Excel 2003's improved List tool.



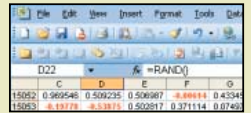
62 Internet: Organizing e-mail in Outlook 2003.



64 Security Watch: Directory harvest attacks.



66 Enterprise: Portals at Krispy Kreme.



69 User to User: Tips and tricks.

## MAKING TECHNOLOGY WORK FOR YOU

code that can be pasted into a Web form. Fortunately, Creative Element Power Tools (free trial, \$18 registration fee, [www.creativelement.com/powertools](http://www.creativelement.com/powertools)) comes with an Extract HTML Page Content tool, which bridges this gap. Type and format your auction description in your Web page editor and save it as an HTML file. Then, right-click on the file, select *Extract Page Content*, and paste the formatted text into the description field of eBay's Sell Your Item form. Finally, click on *Preview Your Description* to double-check your work.

**Easy payment plan.** The easier you make payment for customers, the more likely they'll be to give you their business. The most popular payment method these days is PayPal, which lets members send money to anyone with an e-mail address. The only cost is assessed to sellers, on the order of about 3 percent of the amount a seller receives. But don't be put off; the extra bids you'll get with that PayPal logo in your auction will more than make up for the measly 3 percent fee.

Although PayPal goes to some lengths to safeguard its members, you'll want to take a few extra steps to protect yourself. As a seller, refuse any payments from buyers who don't provide *confirmed addresses* (meaning that PayPal has verified them through their credit card records). Otherwise, you'll be forced to forfeit any money later found to be from a stolen credit card. And as a buyer, always fund your payments with a credit card for an extra layer of protection from your credit card company's charge-dispute department.

**Worth a thousand bids.** Nothing sells your auction better than a good photo, and you can improve your auction photo-taking skills with a few simple tricks. Shoot your item at an angle to exaggerate its depth and to make it look like it's about

to jump out of the screen. Light your item from two different sources (including your camera's flash) to reduce shadows and enhance detail. Finally, make sure it's in focus! Move farther away from your item to help your camera focus on the whole thing, and crop out excess background later.

**Open communication.** Everyone hates junk e-mail, but your attempts to curb it may be costing you more than you realize. Overly aggressive spam filters are probably the biggest

cause of negative feedback on eBay, as sellers' payment instructions often don't get to their customers' in-boxes. And bidders frequently retract bids after receiving no replies to questions sent to sellers, usually because of spam filters on both ends. Start by disabling any spam-blocking services you (or your ISP) may be employing and replacing them with a more passive spam scanner. *PC Magazine* recommends Norton AntiSpam 2004 ([www.symantec.com/antispam](http://www.symantec.com/antispam)) or SpamCatcher ([www.mail-shell.com](http://www.mail-shell.com)), which mark suspected spam so that your e-mail program can trash the messages—but only after you've had a chance to inspect them.

If you suspect that your e-mail isn't reaching its destination, there are a number of back doors you can use. First, use eBay's Contact Member form whenever possible, as e-mail originating directly from eBay's servers is less likely to be trapped by an errant junk filter. If that doesn't work, send your message from an alternate account just in case your return ad-

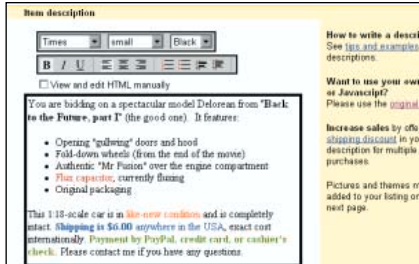
dress is what's causing the problem. If you're a seller, put a note in your auction and payment instructions that tells customers to disable their spam filters if they don't get e-mail from you. Finally, try to answer your bidders' questions right in the auction description to educate—as well as reassure—all your potential customers.

**Tools to use.** Creating new eBay listings can be cumbersome and time-consuming, especially if you're listing a dozen or more items at once. Automated listing software lets you create templates into which you can insert item-specific information. You can save the listings on your hard drive, which makes selling similar items or relisting the same item easy.

You can also use listing tools to schedule your listings without additional fees (a service for which eBay otherwise charges a dime per listing). You can also take your time to compose your listings at 1:00 A.M. and then upload them to eBay the next day at work. Auctions that begin and end during the daytime (by your customers' clocks) fetch higher prices than those that close while your customers are asleep.

eBay's own very capable Turbo Lister application for Windows is available for free from [http://pages.ebay.com/turbo\\_lister](http://pages.ebay.com/turbo_lister) (although normal listing fees still apply). Another worthy and free tool is Auction Submit ([www.auctionsubmit.com](http://www.auctionsubmit.com)), which adds post-auction record keeping, such as the final price and high bidder of each successful auction. Both tools help you list more items in less time and fund your own binge shopping at the world's largest flea market.

*David A. Karp is an eBay addict and the author of eBay Hacks (O'Reilly). David can be reached at [david@ebayhacks.com](mailto:david@ebayhacks.com).*



USE EBAY'S built-in WYSIWYG editor for simple formatting and highlighting.



WHAT ELEMENTS make the photo on top better than the one below?

# Better Lists in Excel

Excel 2003 offers some useful new tools for working with lists.

By Helen Bradley

For many people, an Excel list is the perfect vehicle for managing data, and Excel 2003 offers significant new features that make creating and working with lists easier. A list in Excel isn't, as you might suppose, a single column; it's a group of rows and columns containing related data, like a table in a database. You can now define an area on a worksheet as a list, and when you do, Excel treats it as a unit. A blue border surrounds the range, making the list distinguishable from anything else on the worksheet. You can add or delete rows and sort your data without affecting the rest of the worksheet.

## CREATING A LIST

You can turn an existing data range into a list or create one from scratch. For existing data, click on a cell in the range and choose *Data | List | Create List*. If your columns have headings, enable the *My*

A list has a special insert row—marked with an asterisk—that lets you easily add a new row. You start typing and Excel adds the new row automatically. You can also click a row in the list and, from the *List* toolbar, choose *List | Insert | Row* to add a row in the middle of the list. You can even add data by typing it in the row immediately below the list or in the column to the right of it. Provided you don't have the *Total Row* enabled (see below), the list expands to incorporate your data. Once you've selected the list, you can also drag the handle at the bottom right of the list to adjust the number of rows or columns (but not both at the same time).

## WORKING WITH YOUR LIST

When you create a list, Excel enables the *AutoFilter* for that list automatically. Unlike previous versions of

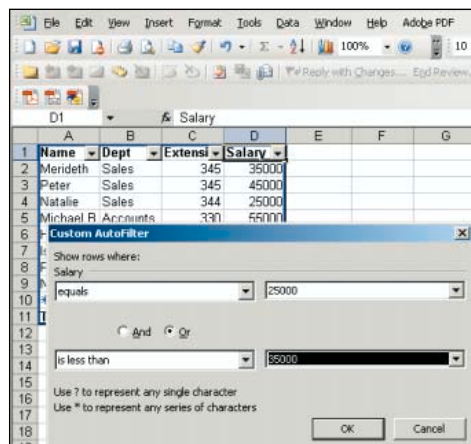
Excel that wouldn't recognize more than one list at a time, Excel 2003 lets you have multiple lists on one sheet, each with its own *AutoFilter* enabled. You can disable *AutoFilter* for one list (*Data | Filter | AutoFilter*), without affecting the setting for any other list.

To sort or filter a list, click the drop-down arrow to the right of the column heading you're interested in and choose either *Sort Ascending* or *Sort Descending* to sort by that column, or you can choose an item to filter the data. You can create complex filters using the *Custom* option and sort on multiple columns using the *Data | Sort* dialog.

Although you can have two lists side by side on the same worksheet, this isn't a good idea. Sorting, adding, and removing rows from one list doesn't affect data in the second list. But if, for example, you filter one list so some rows are hidden, the same rows will be hidden in the adjacent list—in most situations, an un-

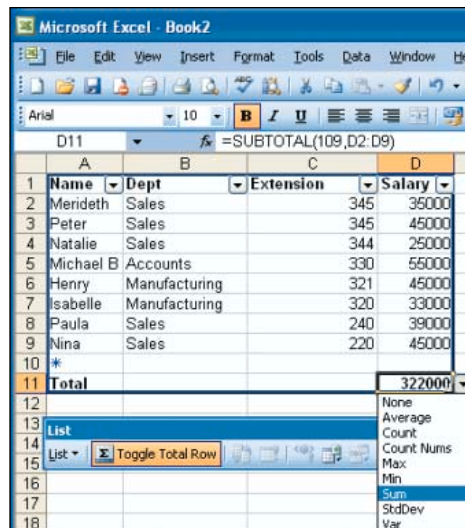
desirable result. This doesn't happen, however, if one list is below another on the worksheet.

You can show a *Total Row* at the bottom of your list, which adds a lot of immediate functionality. You enable the *Total Row* either by clicking the *Toggle Total Row* button on the *List* toolbar or from the *Data | List* menu. The *Total Row* sums the right-hand column, if that column contains numerical data; if not, a count of the items appears. You can disable this total or choose a different function by clicking the down arrow to the right of the total and selecting either *None* or another calculation. You can do the same for any of the columns by clicking in the *Total Row* for that column. You can't, however, add your own calculations



**YOU CAN TAILOR** your list filter using Excel's *Custom* option.

list has *headers* checkbox and click *OK*. To create a list from scratch, type the list headings or simply select a number of cells across a row for the headings and repeat the process; if you don't supply your own column headings, Excel names the columns *column1*, *column2*, and so on.



**WITH TOTAL ROW** enabled, you can select from a range of calculations.

to the *Total Row* options. As you would expect, if you filter the list, the totals reflect data from the visible rows only.

Among the most useful improvements to Excel lists is the new feature that updates charts created from list data automatically when you add a new list item. In the past you could achieve this result only by applying a complicated workaround. To create a chart, simply click in your list, then click on the *Chart Wizard* button on the new *List* toolbar. Should you later add other items to your list, they will be automatically included.

*Helen Bradley is a contributing editor to PC Magazine. Contact her at helen\_bradley@ziffdavis.com.*





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# Organize Your E-Mail In Outlook 2003

New features make sorting and accessing your messages easier than ever. **By M. David Stone**

Among all the new features in Microsoft Outlook 2003 are three important new tools to help organize your e-mail: Search Folders, Favorite Folders, and improved message flagging. The first is easy to dis-

search folder is essentially identical to using Outlook's very slow *Advanced Find* command (*Tools | Find | Advanced Find*). We'd argue that search folders are most useful as an organizing tool, and they are better thought of as organizing folders.

Basically, Search Folders let you organize messages in several ways by storing pointers to individual messages. For example, suppose you work with multiple projects and with ten different people, but with different combinations of people on each project. Suppose also that any given message may relate to more than one project. There will be times when the easiest way to find a particular e-mail is to look through all the messages to or from a given person. At other times, it is more helpful to look through all the messages relating to a given project. No problem: Define one search folder for each person and one for each project.

You can do something similar with rules and standard folders, defining rules to copy mes-

sages to multiple folders, but copying uses up large amounts of disk space. With Search Folders, Outlook uses space only for lists of shortcuts that point to the single copy of each message.

To prove the point, we started with a PST file that was about 25MB and imported over 12,000 e-mails from Outlook Express. The PST file grew by roughly 640MB. We then created a search folder, which we defined to include all the messages in the file. Outlook found the 12,000 messages, many of which were over 5MB. With the search folder, the PST file grew by only 2.1MB—less than half as much as it would have

copying just one of the larger e-mails. The moral: If you want the same message in more than one folder, consider using Search Folders to organize your e-mail.

Keep in mind, however, that if you delete a message from any of the search folders in which it appears, you also delete it from all the other folders, including the standard folder where it resides. (But deleting a search folder will not delete the messages.)

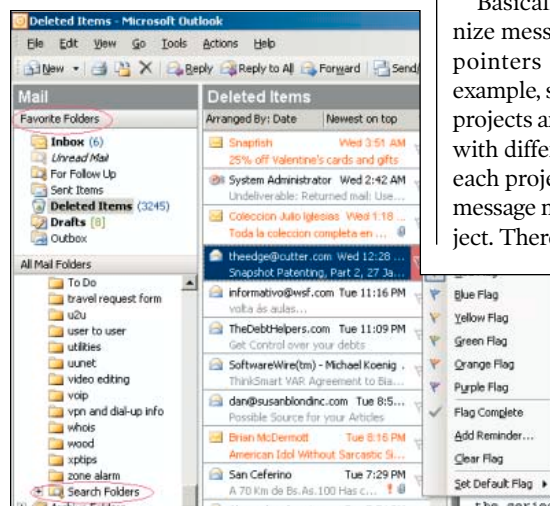
The *Favorite Folders* pane, located in the *Mail* section of the Navigation pane above the *All Mail Folders* list, is easy enough to find. What's easy to miss is that you can add any folder you like to the list. Right-click on a folder in the *All Mail Folders* pane, then choose *Add to Favorite Folders*. To remove the folder from the list, right-click on the folder and choose *Remove from Favorite Folders*.

Adding a folder to Favorite Folders is particularly useful if you have a long list of mail folders and you use some more often than others. For example, you might like to read messages as they show up in your inbox, then move them to the appropriate project folders. If you have a long list of project folders but only a few are active at any given time, you can define the active ones as Favorite Folders, then remove them from the list later.

Finally, flagging messages for follow-up in Outlook 2003 is as easy as clicking on the little flag icon to the right of the message in the folder list (or pressing the Insert key). In case you haven't noticed, however, you can also right-click on the flag icon to choose a different flag color, add a reminder, clear the flag, and more. You might want to experiment with some of the choices. If you have the discipline to be consistent about assigning different-colored flags to different purposes, you should consider organizing the type of follow-up by flag color. And—harking back to search folders—don't forget to take advantage of

the For Follow Up search folder to find flagged messages.

*M. David Stone is a contributing editor of PC Magazine.*



**OUTLOOK 2003'S** Favorite Folders (top left), Search Folders (bottom left), and color-coded message flags (right) help you organize e-mail messages.

miss—incorrectly—as not being useful. The second is easy to miss altogether. The last is hard to miss but still worth pointing out. Here's a look at all three features, starting with Search Folders.

By default, Outlook's Search Folders has three folders in it—For Follow Up, Large Mail, and Unread Mail. As the names imply, each folder will show you a select portion of the messages in your inbox. If you want to see only the messages you have flagged, for example, you can go to the For Follow Up folder. More important, you can create additional search folders. Simply right-click on *Search Folders*, chose *New Search Folder*, and define a folder using any criteria you like.

Don't let the name fool you; search folders are not good search tools. After all, how many searches do you have to repeat on a regular basis? And creating a new



**YOU CAN DESIGNATE** any criteria when customizing your own Search Folders.

MPC recommends Microsoft® Windows® XP Professional for Business.



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-PC MAGAZINE, Nov 25, 2003

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-GOVERNMENT COMPUTER NEWS, Oct 27, 2003

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-ZDNET, Dec 22, 2003

*"This model is a sleek, space-saving alternative"*

-PCWORLD.COM, Nov 7, 2003

*"...the system components are packed into a sleek brushed-aluminum closure."*

-CRN, Oct 13, 2003

*"...stylish, indeed."*

-FEDERAL COMPUTER WEEK, SEPT 15, 2003



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## SECURITY WATCH

# Understanding Directory Harvest Attacks

Ever wonder how spammers got your carefully guarded e-mail address? **By John Clyman**

**T**hink you can protect your in-box by carefully guarding your e-mail address—not posting it in online forums or Usenet messages, using disposable e-mail addresses to register for Web sites, or even leaving it off your business cards? Now's the time for a reality check. If you've ever wondered how a brand-new e-mail account has started getting spam within hours, here's how that can happen.

It's a tenet of legal thrillers as well as the news: The absence of a denial can be as informative as a direct confirmation. This simple idea underlies the *directory harvest attack* (DHA), an increasingly prevalent technique for mining e-mail addresses that can then be bombarded with unwanted solicitations. Enterprise e-mail security vendor Postini reports that DHAs increased by 250 percent in 2003 and now account for as much as one-quarter of the requests that some SMTP (Simple Mail Transfer Protocol) servers process each day.

In a DHA, an attacker unleashes a program that guesses at possible e-mail addresses within a domain and attempts to send messages to those addresses. The server rejects requests intended for addresses that don't exist. By the process of elimination, the addresses it doesn't reject are deemed valid, and the program

can add them to a spammer's databases.

The result isn't just more spam (as if that weren't bad enough). An aggressive DHA can place such intense demands on a server that it mimics a denial-of-service attack and slows legitimate e-mail delivery.

There are two primary techniques that DHAs employ to generate possible addresses within a given domain. The most blatant brute-force method is to run through every possible combination of alphanumeric characters. Alternatively, DHAs may use a variation of the time-honored *dictionary attack*, which uses lists of common names and the fact that e-mail addresses often follow predictable patterns, such as first initial and last name.

While you could, in principle, try to foil dictionary-based DHAs by choosing atypical or obscure e-mail addresses, doing so would make those addresses harder for others to remember. And in any case, that wouldn't protect you against scripts that simply try all character combinations.

Another seemingly simple countermeasure would be to configure the server not to reject messages to invalid e-mail addresses; instead, silently accept them and just throw them into a black hole. But there's a significant cost to this strategy. If the spammer's script decides that the

## THE LOOKOUT

## MYDOOM HOBBLES E-MAIL

A powerful worm known variously as W32/Novarg.A, W32/Shimg, W32/Mydoom, or W32/Mimail.R began devastating personal and corporate e-mail systems across the globe in late January. This fast-moving, mass-mailer Internet worm apparently started spreading on the popular peer-to-peer file-sharing application Kazaa and then moved to e-mail. The virus overwrites certain system files, e-mails itself to every e-mail address it finds on a victim's machine, and opens a back door to malicious attacks. It affects systems running Windows 95 or later. It became the top worm in North America almost overnight, and most antivirus companies had elevated the threat level to high or dangerous.

To find out how to protect your system from MyDoom, see our full article at [www.pcmag.com/article2/0,4149,x1463442,00.asp](http://www.pcmag.com/article2/0,4149,x1463442,00.asp).—Jay Munro

absence of a rejection implies it's a live address, you're going to get even more spam flowing into that nonexistent account and bogging down your infrastructure.

So what *can* you do? A number of mail server and security vendors offer technological fixes that promise to mitigate DHAs. Products from companies like Kerio, Postini, and Rockliffe monitor statistics like the proportion or frequency of misaddressed e-mails sent from a given IP address; if that measure crosses a threshold, messages or senders can be rejected or deferred for a period of time.

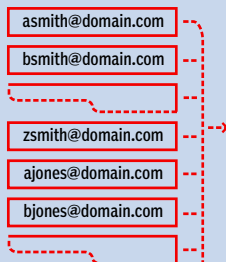
Deferral rather than blocking helps ensure that the server won't reject legitimate e-mail that is mistakenly flagged as DHA attempts. This slows down delivery, but like a log-on dialog box that locks out further attempts for 30 minutes after three consecutive unsuccessful attempts, this throttling retards the efficiency of an attack enough to make it largely ineffective.

Such technological solutions can help, but ultimately the fix has to come in the protocols we use for e-mail. While there is some action in that area (see "Can E-Mail Survive?" February 17, page 64), it'll be some time before we see real progress.

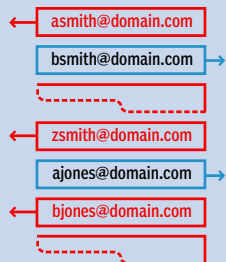
John Clyman is a contributing editor of PC Magazine.

### How a Directory Harvest Attack Works

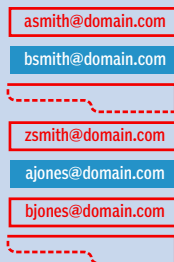
A spammer sends messages to thousands of possible e-mail addresses within a domain.



The receiving SMTP server rejects most addresses as invalid.



The spammer tracks rejections and infers that any messages not rejected went to valid addresses.



MPC recommends Microsoft® Windows® XP Professional for Mobile Computing.



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# What Else Is Hot Now At Krispy Kreme?

Its doughnut recipe may be a secret, but its portal strategy is anything but. **By Sarah L. Roberts-Witt**

Nothing beats the taste of a warm Krispy Kreme doughnut melting in your mouth. Building its reputation on this experience, the company has expanded to over 330 stores throughout the country and around 4,000 employees. And to manage its growth, Krispy Kreme Doughnut Corp. has turned to a hot technology: portals.

The concept of the portal has been around almost as long as the Web itself, with Yahoo! serving as the oft-cited archetype. Portals, however, aren't just for the consumer Web, as the growth of the enterprise portal market has demonstrated. Despite the overall slowdown in software sales, this category has continued to thrive, and the number of players has mushroomed as well. Big-name companies such as BEA Systems, IBM, Oracle, PeopleSoft, and SAP are competing with portal purists such as Plumtree Software. META Group predicts that the portal market will grow 161 percent in revenue this year.

Early portals were essentially card catalogs for enterprise data sources, but today's portals are full-blown application frameworks. They are based on either the J2EE or Microsoft .NET development environments and include off-the-shelf, customizable, and increasingly, standards-based connectors to applications. Serving as an integration point for corporate apps, data, and business logic on the back end and as an access point for employees at the front, the portal has become central to business operations.

This is certainly true for Winston-Salem, North Carolina-based Krispy Kreme, whose famed doughnuts have grazed the lips of everyone from Bill Clinton to Jimmy Buffett. In 2001, Krispy Kreme launched its own enterprise portal framework based on technology from Corechange (now owned by Open Text). "We needed a conduit, a way for every-

body to communicate to and fro in as homogenous a fashion as possible," says Frank Hood, the company's chief information officer.

Krispy Kreme also needed a way to modernize operations as it went public and expanded. With myKrispyKreme.com, as the portal is known, Krispy Kreme has made several critical applications available to its franchisees. One of the most useful is the Web-based order management system, based on software from Integrated Visual Systems. The idea was to take the basic ordering functions and business rules that Krispy Kreme had developed over the years and put them online in a way that store managers and franchise owners could easily use.

In addition to taking orders, the portal sends alerts to remind store managers to review and place their orders. It makes suggestions about the quantity and types of supplies managers should order based on an analysis of data trends for that particular store. The portal sends and processes all orders electronically, a sharp contrast to the ancient faxing and manual-data-entry approach. Ordering errors are

down by nearly 90 percent, and each distribution rep is able to handle between 10 and 15 more stores. "The portal lets our reps be knowledge workers rather than order takers, which is good for them and for the company," says Hood.

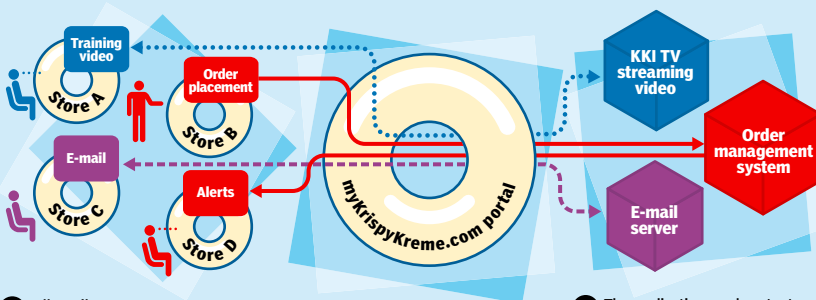
The order management system is only one of many tasty fillings found in the portal. An inventory management component lets near real-time views into inventory levels, and Krispy Kreme Interactive TV delivers streaming-media training videos to ensure that new goodies and services are delivered consistently in all of its stores.

Several multilingual versions of the myKrispyKreme.com portal are in the works as well. This is critical, because the company is planning to enter markets in Japan, Mexico, South Korea, and Spain. Hood says his team is already in the process of implementing a multilingual help desk with translation for some portions of the portal. "We recognize that not everybody in the world speaks English, which has put us on the track of having multilingual versions of certain applications," Hood says.

The portal has plenty of fun stuff, too. Weather, news, sports, contests, and of course, e-mail are all available to the 900 users of myKrispyKreme.com. But those are just the sprinklings on top of a portal framework that is as critical to Krispy Kreme's long-term success as the delicious doughnut recipe created nearly 67 years ago.

## An Original Glazed Portal

Krispy Kreme's enterprise portal gives 330-plus retail stores access to core applications and information.



- 1 All retail stores can access myKrispyKreme.com using either a broadband or dial-up connection to the Internet. Employees can watch training videos, place orders, check existing orders, assess inventory levels, and receive alerts.
- 2 The portal, based on technology from Corechange, serves as the conduit to multiple applications and data sources as well as the Web.
- 3 The applications and content in the portal include KKI TV streaming training videos, an order management system based on software from Integrated Visual Systems, e-mail, weather, and news.

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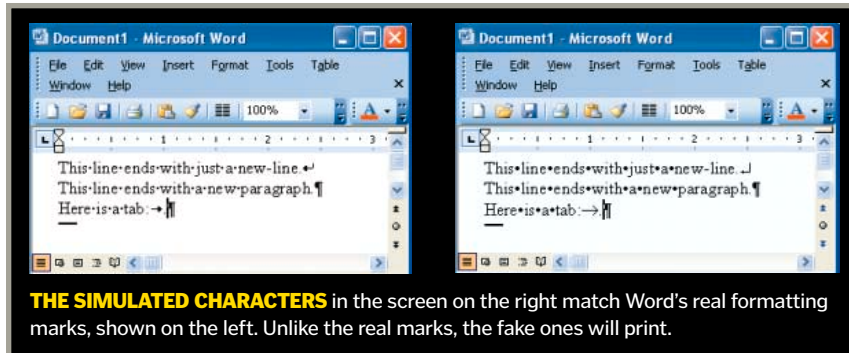
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## USER TO USER

PC MAGAZINE'S COMMUNITY OF  
EXPERTS AND READERS

**THE SIMULATED CHARACTERS** in the screen on the right match Word's real formatting marks, shown on the left. Unlike the real marks, the fake ones will print.

### Print in Word with Formatting Marks

I teach classes on Microsoft Word and often use the Show/Hide Formatting feature (Ctrl-Shift-8) when demonstrating various topics. I would like to be able to print a document and have these formatting marks, such as paragraph marks and tabs, show up in the printed document. How can I do this?

DOROTHY BAUMANN

In the *View* tab of Word's *Options* dialog you can check boxes to force display of various formatting marks, or check the *All* box to show them all. As you noted, Ctrl-Shift-8 is a keyboard shortcut that toggles the *Show All* option on and off. But there just isn't a way to print the document with formatting marks. What you'll have to do is create a copy of the document and replace the relevant formatting elements with characters that closely resemble the marks.

First, gather the characters you'll need. Choose *Symbol* from the *Insert* menu, make sure the font is set to whatever font you're using, and scroll down one screen. You should see the paragraph mark (¶) immediately followed by a midline dot character (·). Double-click on each of these to insert it in the document (you'll remove the inserted characters later). Switch to the *Symbol* font, again scroll down one page, and insert a right-pointing arrow (→) and a bent arrow (↵). Close the *Symbol* dialog.

Highlight the paragraph mark that you inserted and cut it to the Clipboard by pressing Ctrl-X. Press Ctrl-H to launch Word's *Find/Replace* dialog. Click in the *Replace with* box and press Ctrl-V to paste the paragraph mark

there. Add ^p (the code for a new paragraph) after the mark, and enter ^p alone in the *Find what* box. When you click on *Replace All*, every invisible new paragraph code will be preceded by a visible paragraph mark. Repeat the process to precede each new line code (^l) with the bent arrow. When you copy the bent arrow into the *Replace with* box, it will appear as the wrong character. Click on the *More* button, click on *Format*, click on *Font*, and select the *Symbol* font. The displayed character won't change, but when you click on *Replace All*, the correct character will be inserted. Finally, replace all tabs with the right-arrow (again selecting the *Symbol* font) and all spaces with the midline dot. You now have a printable version of the document that very closely resembles Word's display showing all formatting marks.—Neil J. Rubenking

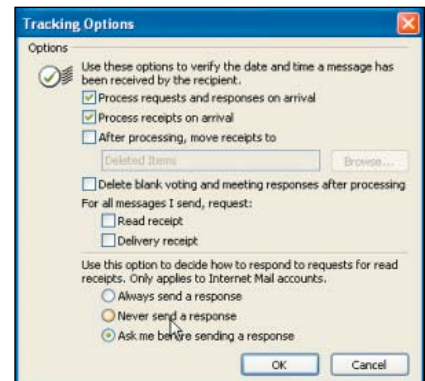
### Avoid Accidentally Replying To Spammers

If you use Microsoft Outlook, here's a tip that may help eliminate some spam. Unless you check all the setting options in Outlook, you might unknowingly be replying to spammers. How? Select *Options* from the *Tools* menu, click on the *E-mail Options* button, then click on the *Tracking Options* button. Make sure that *Always send a response* is not checked. If it is, uncheck it to stop automatically sending e-mail confirmations to spammers. If you have the automatic response selected, you may be unwittingly verifying your e-mail address to spammers. This tip is specific to Outlook 2003, but similar settings should be found in previous versions of Outlook.

JOSEPH MAJCHROWICZ

Spammers send out mail to thousands of addresses, many of which are out of date or otherwise invalid. If they can identify a valid e-mail address, it immediately becomes more valuable and goes right to the top of the list for more spam. Sometimes the spam will include instructions on how to opt out, but following those instructions just verifies that your address is active. Most of us know not to reply to spam; we just have to make sure our e-mail clients aren't responding on our behalf. Recent versions of Outlook Express also have the ability to supply return receipts automatically. Select *Options* from its *Tools* menu and click on the *Receipts* tab. Make sure you haven't selected the option always to send a receipt.

A sneaky spammer can also validate addresses using a *Web bug*, also known as a *Web beacon*. This is typically a 1- by 1-pixel transparent GIF, but in truth, any external content in an HTML-based e-mail message can function as a *Web beacon*. When you preview or view the message, your e-mail client has to fetch that external content from the spammer's server, which identifies your e-mail address as a live one. Outlook 2003 blocks images and external content by



**CHECK YOUR SETTINGS** to see if Outlook is replying to e-mail automatically.

default. To check or change this setting, click on the *Change Automatic Download Settings* button on the *Security* tab of the *Options* dialog. Note that in the upcoming Windows XP Service Pack 2, Outlook Express will gain the ability to block external content in HTML e-mail just as Outlook does now.—NJR

Most of us know not to reply to spam; we just have to make sure our e-mail clients aren't responding for us.

# The printer drivers that ship with Windows XP often suffer from shortcomings.

## Personalize the Windows XP Places Bar

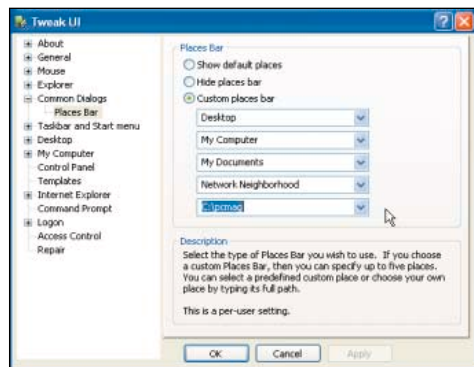
If you're running Windows XP, you can use the Tweak UI PowerToy (downloadable at [www.microsoft.com/windowsxp/pro/downloads/powertoys.asp](http://www.microsoft.com/windowsxp/pro/downloads/powertoys.asp)) to customize the Places Bar in the standard *Open* and *Save As* dialogs. When you run Tweak UI, go to *Common Dialogs | Places Bar* on the hierarchical list; this is where you can change the folders that appear in the Places Bar. Note that you can have only up to five places, and for each your choice is limited to certain system folders (such as *History*, *My Pictures*, and so on).

CLAUDIO FARIA

Our article "Personalize Office's Places Bar" ([www.pcmag.com/article2/0,4149,1265371,00.asp](http://www.pcmag.com/article2/0,4149,1265371,00.asp)) inspired many readers to ask whether the systemwide *File | Open* and *File | Save As* dialogs could be configured in a similar fashion. As this tip explains, they can, but only if you're running Windows XP. You can choose from among 11 system folders, or you can actually type in any folder name you like.

The entries are stored in Registry values named *Place0* through *Place4* under the key *HKEY\_CURRENT\_USER\Software\Microsoft\Windows\CurrentVersion\Policies\cmdlg32\placesbar*. Each value holds either an ID number for one of the system folders or the full path name of a user-specified folder.

We tried to extend the list by adding a *Place5* value, but this had no effect on the actual file dialogs. Still, you can configure the



**USE TWEAK UI** to personalize your Windows XP Places Bar.

five available entries for fast access to your most-used folders. We suggest you leave one set to *Desktop*, so you can easily reach folders other than your special few.—*NJR*

## Fix Excel 2003's RAND Function

In December, *PC Magazine* reader and Excel maven Earl Takasaki brought a curious Excel bug to our attention: The *RAND* function in Excel 2003 may return negative numbers. The problem shows up only in Excel 2003, not in earlier versions. To demonstrate this bug, open a new workbook and enter the

	C	D	E	F	G
15052	0.969546	0.509235	0.506987	-0.00614	0.43345
15053	-0.19778	-0.53875	0.502817	0.371114	0.07497
15054	0.2284	0.410031	0.547987	0.467337	0.45841
15055	0.273551	0.040542	0.237465	0.357643	0.34484
15056	0.495897	-0.35098	0.815332	0.181186	-0.2094
15057	0.597295	0.591543	0.489319	-0.50799	0.35271
15058	0.391593	0.469197	-0.04146	0.431292	0.71208
15059	-0.40119	-0.16442	0.710359	0.9336	-0.1945
15060	0.599462	0.799239	0.891991	-0.08853	0.66733
15061	0.233345	0.135441	0.26171	0.368448	0.2786
15062	0.912506	0.448055	0.644471	0.164368	0.32335

**A BUG LETS** Excel 2003's *RAND* function return negative numbers.

simple formula *=RAND()* in cell A1. With A1 still highlighted, select *Conditional Formatting* from the *Format* menu. Leave the first drop-down list set to *Cell value is*, select *Less than* in the second one, and enter 0 in

the box at the right. Click on the *Format* button and select *Bold red text*, click on *OK*, and click on *OK* again.

Now copy cell A1 to the Clipboard, click in cell A2, and press *Ctrl-Shift-Down Arrow*; this will highlight all the remaining cells in column A. Press *Ctrl-V* to paste the formula and formatting into those cells. Click on the header for column A to select the entire column and press *Ctrl-C*. Click on column B's header and drag to the right until columns B through T are selected, then press *Ctrl-V* to paste the copied cells. You now have over a million instances of the *RAND()* function. Press *F9* to recalculate the worksheet several

times. Before long, you'll find the sheet liberally sprinkled with negative numbers, easily recognized because the conditional formatting makes them stand out. The same bug affects the related *RANDBETWEEN()* function.

We brought this bug to Microsoft's attention, and a fix is now available via article 834520 in Microsoft's Knowledge Base (<http://support.microsoft.com/default.aspx?scid=kb;en-us;834520>). If your use of Excel ever includes vast numbers of *RAND()* functions, perhaps for simulation purposes, be sure to get this fix.—*NJR*

## Better Drivers

I recently discovered an apparent problem with a Microsoft printer driver in Windows XP. After buying a new computer with Windows XP installed, I moved my Epson printer—which had been working without problems on a Windows 98 machine—to the new computer. Windows XP recognized the printer when I plugged the device into a USB port, and it automatically installed drivers. Under the new installation, however, I no longer had the benefit of seeing the printer ink levels or other status information. Even worse, my photos suffered from low color saturation and a greenish tint.

I finally solved the problem by downloading the drivers and a print utility for Windows XP from Epson's Web site. Once again, the colors in photos look right, and I have a utility that shows ink levels.

PAUL ZANKEL

Your experience is not unusual. The printer drivers that ship with Windows XP often suffer from shortcomings, and the best that can be said—for some of the drivers at least—is that they'll let your printer print. We've seen similar problems in *PC Magazine Labs*—most recently with a Lexmark color laser printer, which suffered from extremely slow printing and poor output quality using the driver that ships with Windows XP. Changing to Lexmark's own driver improved both speed and quality. The moral here is simple enough, and it applies to most hardware, not just to printers: Even if Windows XP comes with a driver for your hardware, check the vendor's Web site for a better version.—*M. David Stone*

## Keep Your Wireless Connection from Changing

I use an 802.11g wireless connection, and I know that the *Windows Zero Configuration* applet searches for a new connection every 3 minutes. I have found that if this applet is disabled at boot-up, the wireless connection is not made, but if WZC is stopped shortly after a wireless connection is made, the connection stays active indefinitely, barring outside influences.

I have been using *Services.msc* to stop WZC (I have it in my start-up folder), but I have to scroll to the bottom of the *Services* window to access WZC to stop it. I would like to find a faster way to do this, perhaps in the form of a shortcut to a batch file that would start or stop the service, or a shortcut directly to WZC within the *Services* window. Can you tell me how to accomplish my goal?

ANDREW CARSELL

Wireless networks are becoming more and more common. It's not at all unusual to be within range of several. If your connection stutters, WZC may try to hook you up with a different connection. Yet, as this reader notes, if WZC is off at start-up, the system may not connect at all. You don't have to open the *Services* dialog, scroll to the bottom, double-click on *Wireless Zero Configuration*, and click on the *Stop* button. Instead, you can create a shortcut.

Open Windows Explorer and navigate to C:\Windows\System32 (or C:\Winnt\System32 if you're running Windows 2000). Locate the file *Net.exe*. Right-drag it onto the Desktop and choose *Create shortcut(s)* here when you drop it. Click twice slowly in the filename area and name the shortcut *Stop WZC*. Right-click on the shortcut, choose *Properties*, and click on the *Shortcut* tab. The *Target* field will probably show C:\WINDOWS\system32\net.exe. Append a space to this, followed by *stop wzcsvc* (don't forget the space before *stop*). If you like, repeat these steps and create another shortcut to start the service; just replace *stop* with *start*.—NJR

### HOW TO CONTACT US

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- Integrated Gigabit Ethernet and modem
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(Monitor not included)



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- 40GB hard drive • CD-ROM
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- Gigabit Ethernet-integrated
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### IBM ThinkCentre M50

#### Distinctive IBM Innovations:

- Rapid Restore Ultra – Push-of-a-button data backup and recovery

- IBM Embedded Security Subsystem 2.0 – Strongest security as a standard feature

#### System Features:

- Intel Pentium 4 Processor with HT Technology 3.0GHz
- Microsoft Windows XP Professional
- 512MB DDR SDRAM<sup>1</sup>
- 40GB hard drive • DVD-ROM
- Intel Extreme Graphics 2
- Gigabit Ethernet-integrated
- Norton AntiVirus 2003 OEM Edition
- Lotus SmartSuite Millennium license
- 3-yr limited warranty with limited onsite service<sup>2</sup>

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### IBM ThinkCentre S50

#### Distinctive IBM Innovations:

- The smallest IBM desktop without compromise: 62% smaller than a standard IBM desktop

#### System Features:

- Intel Pentium 4 Processor with HT Technology 2.80GHz
- Microsoft Windows XP Professional
- 512MB DDR SDRAM<sup>1</sup>
- 40GB hard drive • CD-ROM
- Intel Extreme Graphics 2
- Gigabit Ethernet-integrated
- Norton AntiVirus 2003 OEM Edition
- Lotus SmartSuite Millennium license
- 3-yr limited warranty with limited onsite service<sup>2</sup>

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### IBM ThinkCentre S50

#### Distinctive IBM Innovations:

- The smallest IBM desktop without compromise: 62% smaller than a standard IBM desktop

- IBM Embedded Security Subsystem 2.0 – Strongest security as a standard feature

#### System Features:

- Intel Pentium 4 Processor with HT Technology 3.0GHz
- Microsoft Windows XP Professional
- 512MB DDR SDRAM<sup>1</sup>
- 40GB hard drive • DVD-ROM
- Intel Extreme Graphics 2
- Gigabit Ethernet-integrated
- Norton AntiVirus 2003 OEM Edition
- Lotus SmartSuite Millennium license
- 3-yr limited warranty with limited onsite service<sup>2</sup>

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#58P8774 \$279

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Targus Value Mobile Essentials Kit  
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ThinkPad Port Replicator II  
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Issue may be subject to additional charges. <sup>1</sup>This machine is designed to be repaired during the applicable warranty period primarily with customer-replaceable parts provided by IBM. IBM will only send a technician onsite to perform a repair if (a) remote telephone diagnosis and/or customer part replacement are unable to resolve the problem, or (b) the part is one of the few designated by IBM for onsite replacement. For a list of onsite replaceable parts, contact IBM. Support unrelated to a warranty issue may be subject to additional charges. <sup>2</sup>These services are available for machines normally used for business, professional or trade purposes, rather than personal, family or household purposes. Service period begins with the equipment date of purchase. If the machine problem turns out to be a Customer Replaceable Unit (CRU), IBM will express ship the part to you for quick replacement. Onsite 24x7x2-hour service is not available in all locations. For ThinkPad notebooks requiring LCD or other component replacement, IBM may choose to perform service at the depot repair center. <sup>3</sup>Standard shipping included when you order online. U.S. only. <sup>4</sup>Requires compatible wireless-enabled options, sold separately. <sup>5</sup>ThinkPad Protection is not available in all states; contact your sales representative for details. ThinkPad Protection cannot be combined with other warranty service upgrades. ThinkPad Protection #58P8774 is for purchase with 3-year warranty systems; #58P8772 is for purchase with 1-year warranty systems. IBM reserves the right to alter product offerings and specifications at any time, without notice. IBM is not responsible for photographic or typographic errors. All IBM product names are registered trademarks or trademarks of International Business Machines Corporation in the U.S. and other countries. Intel, Intel Inside, the Intel Inside logo, Intel Celeron, Intel Centrino, the Intel Centrino logo and Pentium are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the U.S. and other countries. Microsoft and Windows are trademarks or registered trademarks of Microsoft Corporation. Other company, product and service names may be trademarks or service marks of others. © 2004 IBM Corp. All rights reserved.

# What to do when things go WRONG

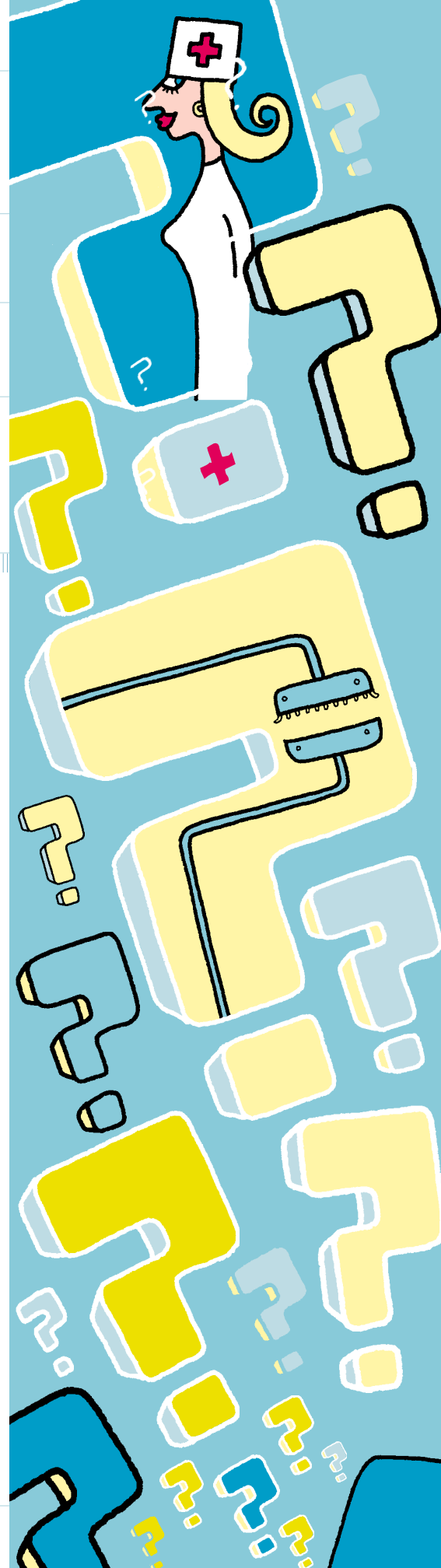
By Matthew P. Graven

ILLUSTRATIONS BY SUSANNE SAENGER

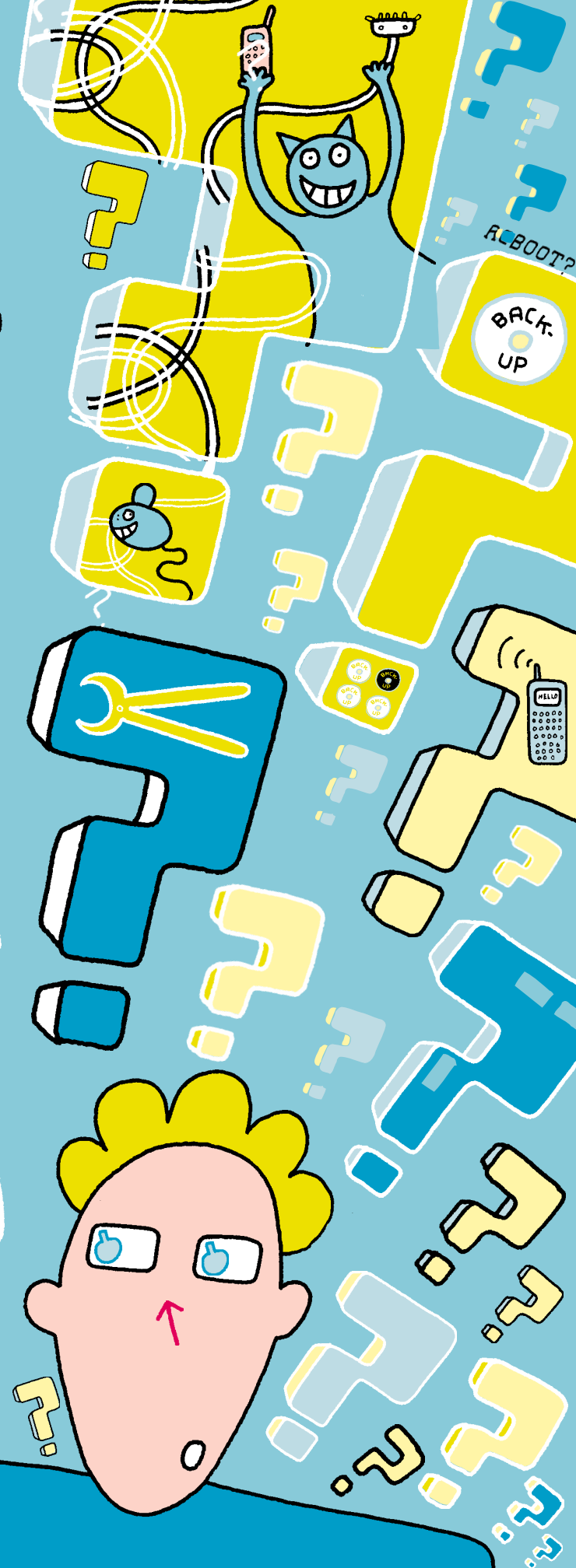
So many things can go wrong with your computer: bad drivers, malfunctioning components, hardware conflicts, spyware invasions—the list goes on and on. Or perhaps you just can't get your software to work the way you think it should. Diagnosing the problem can be tricky, let alone fixing it once you know exactly what is wrong. Some issues can be fixed with a few blanket procedures, such as updating your drivers and operating system. Others are more complicated and will leave you wishing for some expert advice. But where can you turn for help when something goes wrong with your computer?

You can't always depend on manufacturers for help. Maybe your warranty has lapsed and you can't get support. Or maybe your PC vendor says you voided the warranty when you had the audacity to upgrade your OS. Or perhaps companies are playing a blame game: The printer vendor says the problem is with Windows, while Microsoft says the problem lies with your PC hardware.

Don't worry. We're here to help you find help. We start with invaluable tips that can solve many problems in a matter of minutes and with advice on what information you should gather before you look elsewhere for aid. In case our tips don't solve your problem, we've combed the Web and put together a catalog of terrific, free support sites that offer troubleshooting advice, technical forums, and repair guides. And in case you want an expert to lend a hand, we've tested five paid-support services, with prices starting as low as \$49.95 a year.







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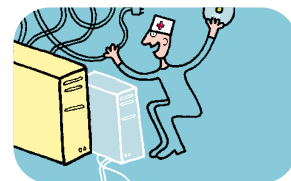
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# Help Yourself

Ten things to do before you talk to a techie.

By Jay Munro

*Although it's easy to pick up the phone and call that friend who always has an answer, or post a message to your favorite tech forum, you might want to take a few steps to try to solve the problem on your own—or at least be prepared with the information your geek in shining armor will need to troubleshoot the problem for you. Here are ten steps that can help you solve your problems faster.*



### 1. Update your system.

Make sure that you are using the latest drivers for your hardware—and that you've installed all the Windows Updates—and check for updates to any applications you use, especially any that seem to be related to your current computer problem.

Microsoft is always updating Windows with minor patches and bug fixes. Depending on whether you use Windows Automatic Updates, keeping the OS up to date may require some diligence on your part. In Windows XP, select Start | All Programs | Windows Update. (Other programs will often include update options on their Help or File menus.)

### 2. Check your connections.

This may sound obvious, but check all the cables to make sure they are plugged in securely. Don't ignore this step. USB, printer, and serial cables have a way of working themselves loose and causing problems. Also make sure all the boards are seated properly and the cables connected inside your PC. If you get a beeping tone when you boot, and no video, start by opening the machine and reseating the graphics board in its slot.

### 3. Reboot.

Windows sometimes gets into a confused or panic state, and by simply rebooting you can clear the memory and set

Possible types of restore points are: system checkpoints (scheduled restore points created by your computer), manual restore points (restore points created by you), and installation restore points (automatic restore points)

1. On this calendar, click a bold date. 2. On this list, click a restore point.



4

things straight. Similarly, if you're having a problem connecting to the Internet, try rebooting your cable/DSL modem and router by unplugging and replugging them. But this isn't something you should have to do often. If you find yourself rebooting your router once a day, the problem is a bit deeper.

#### 4. Roll back your system.

Windows XP and Windows Me offer System Restore, which lets you roll back your computer to an earlier configuration. By default, Windows creates periodic checkpoints

either on a scheduled basis or when you make changes to the system. In case of a problem, the System Restore wizard lets you step back to a prior state when your system was running better; it won't delete data files, but will restore system files and Registry entries. To get to the System Restore wizard, go to Start | Accessories | System Tools | System Restore.

#### 5. Roll back drivers.

Remember when we said to update your drivers? Well, sometimes that can backfire on you. If something breaks

when you update a driver, you should use the Driver Rollback utility, which works much like System Restore but only on a specific device driver.

To roll back to a previous driver, open the device manager, open the device manager (Control Panel | System | Hardware | Device Manager), select the device with the driver you want to roll back, right-click, and open its Properties. Under the Drivers tab, you can update, roll back, or uninstall the driver.

#### 6. Narrow down the problem.

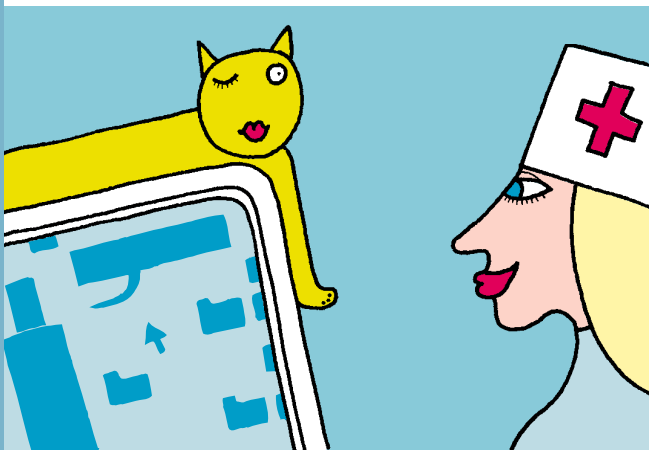
Try to isolate when and where the problem happens. If, for example, you discover your printer isn't working from Word, check to see whether it works from Notepad or IE. Many times the problem is just a wrong setting.

If your USB camera stopped

working when you plugged in your printer, try removing devices and putting them back one by one to see exactly when the problem occurs. Maybe you can print when you first boot up, but it seems to go haywire after you send some faxes? Does the problem occur all the time or only after the machine has been running for a while? Is the problem repeatable? Observing what situations lead up to a problem can be a great help in determining what is causing it.

#### 7. Know your system.

Resolving a problem over the phone requires a series of questions, often having to do with the specific hardware, OS, and software you're using. Know the model numbers for all your hardware. You can access CPU and memory info



## ALL-IN-ONE

### Experts Exchange

[www.experts-exchange.com](http://www.experts-exchange.com)

This is a giant site populated by many professional IT experts. You earn points by answering questions and can then trade in your points to ask questions and view answers. Alternatively, you can pay a monthly fee. Questioners are expected to report

whether the answers solved their problems. The site boasts massive amounts of accurate information, but you have to plow through a lot of irrelevant answers to find the one you want. Be aware that canceling a paid subscription requires sending or faxing a hard-to-find paper form.

### Suggest A Fix

[www.suggestafix.com](http://www.suggestafix.com)

This free forum has lots of friendly visitors giving detailed and generally relevant answers on most any computer-related topics you can think of, with an emphasis on Windows. But the site can be slightly frustrating if you're researching a problem, because many questioners don't

report whether the answers they received worked or not.

### Tech Support Guy

[www.helponthe.net](http://www.helponthe.net)

More like a raucous, crowded bar than a one-on-one consultation, this wide-ranging site is littered with lots of replies from people who don't know anything about the subject in

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by selecting Control Panel | System. Drill down from here into Hardware | Device Manager for information about other devices such as your sound and graphics cards.

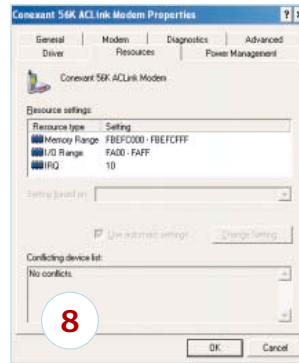
Try to remember any new software, no matter how small or insignificant, that you've installed or noticed lately. It can also help to jot down any services running in the background. To access a list of what is running on your Windows XP system, press Ctrl-Alt-Del and select Task Manager. You can also get very detailed info from Start | All Programs | Accessories | System Tools | System Information.

#### 8. Check for IRQ conflicts.

IRQs (interrupt requests) are hardware connections that the CPU uses to receive sig-

nals from a device. If two devices are using the same IRQ, they can conflict with each other and cause crashes. In most cases, IRQs are assigned automatically when the PC boots. Occasionally, a device may want a specific IRQ, even though this causes a conflict with another device.

To view a device's IRQ listings, open Start | Control Panel | System and select Device Manager. Find the device (sound card, modem, whatever); right-click on it and select Properties, and click the Resources tab. You will see a list of resources: I/O range, memory range, and IRQ. Some devices let you configure these; other configurations are automatic. You will also see the conflicting-device list. Note the IRQ and any conflicting



devices. Sometimes swapping two boards or moving one farther away will fix an IRQ conflict.

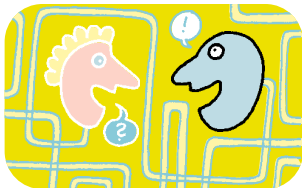
#### 9. Access crash logs.

When a crash occurs, an app called Dr. Watson saves info about your memory and configuration to a crash log file. In Windows XP, the default location is C:\Documents and Settings\All Users\Appli-

cation Data\Microsoft\Dr Watson. The crash log is a text file called Drwtsn32.log, which can be read in Notepad or sent via e-mail to a tech-support person. Dr. Watson can also create a crash dump, which contains similar information but is readable only by a debugging utility.

#### 10. Back up your data.

Before you start following directions over the phone and tearing your system apart, make sure you have a backup of all your important documents, e-mail, and other data. Although many fixes will be as simple as downloading a new driver, you'll be glad you have a backup if you find yourself reinstalling the OS. You should also have your original CDs around in case you need to reinstall apps.



question. But eventually a real expert gets a word in and provides terse, accurate information. One suggestion: Always look at the latest answer in a thread before plowing through the rest.

## WINDOWS

### Annoyances.org

[www.annoyances.org](http://www.annoyances.org)

This long-established site combines well-documented troubleshooting articles with thousands of archived requests and answers, all accessible through clear site design and an effective search engine. The questions and answers are cluttered with insulting and unhelpful replies, but the articles created by the site's staff are reliable and useful.

### BlackViper.com

[www.blackviper.com](http://www.blackviper.com)

This is a site that power users tell each other to visit for its unique guide to the background "services" running in Windows XP that you can selectively turn off to increase speed and stability. It's not for beginners, but expert users who are willing to follow this site's prescribed safeguards can hot-rod Windows XP with the lucid, careful information on the site.

### Doug's Windows Tweaks and Tips

[www.dougknox.com](http://www.dougknox.com)

Doug Knox's site should be your first stop for ultrareliable tips for tweaking and repairing Windows XP. Downloads include the author's free Visual Basic scripts, shareware utilities (including one-click solutions for tasks like changing the name of a registered user),

and elaborate programs that give more control over security settings than anything Microsoft offers in Windows XP Home or Pro.

### JSI FAQ

[www.jsiinc.com](http://www.jsiinc.com)

Just the FAQs, no fancy graphics. This venerable no-nonsense site has 7,000 detailed, trustworthy tips about the Windows NT/2000/XP platform, each in a clear step-by-step format, with a search engine that lists dozens of possible matches in order of relevance to improve your chances of finding a solution. If you can't solve your Windows XP problem here, it may not be solvable.



### TweakXP.com

[www.tweakxp.com](http://www.tweakxp.com)

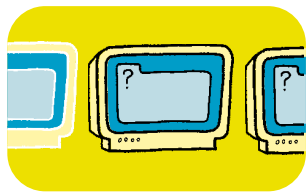
This rapidly growing collection of Registry and other tweaks helps gamers and control freaks squeeze every last ounce of performance out of Windows XP. Unlike many tweak sites, which seem to endorse everything users submit, this one has a collection of "incorrect hints," which can save you from computer myths found elsewhere.

### Windows XP Expert Zone Community

[www.microsoft.com/windowsxp/expertzone](http://www.microsoft.com/windowsxp/expertzone)

Microsoft's own tip and troubleshooting site for Windows XP and related products is packed with columns by Microsoft technicians, who often tell you to ignore the company's printed instructions and use more effective techniques, which they spell out in detail. The user forums seem less useful than

the third-party sites listed elsewhere in this story, and a disappointingly large number of posted questions are left unanswered.



## SOFTWARE

### Adobe User to User Forums [www.adobeforums.com](http://www.adobeforums.com)

Adobe's graphics prowess is well hidden by these forums' bare-bones interface. With lists of hundreds of messages, it's a good thing that the search engine almost always leads to the best possible solutions to problems with Adobe products. And the first items on the list in each forum answer the questions you're most likely to ask. Problems that can't be solved generate vigorous complaints, so you won't waste time looking elsewhere for nonexistent answers.

### Inside Outlook Express <http://insideoe.tomsterdam.com>

This site is a comprehensive guide to enhancing and repairing Outlook Express. It provides explanations on how to back up messages, lists all known bug fixes, and reassures you that you're not the only user dealing with unfixed bugs, like that mysterious file named "~" that OE sometimes leaves on your desktop.

### Joseph Rubin's ExcelTip.com [www.exceltip.com](http://www.exceltip.com)

Hundreds of well-organized tips on everything from keyboard shortcuts to Visual Basic programming, along with details

about every recent version of Excel, make this a one-stop source for Excel answers. If the Webmaster's tips don't solve your problem, ask in the visitors' forum, and you can expect to get a helpful answer in a few hours or less.

### Microsoft Office Online <http://office.microsoft.com>

Microsoft's official Office information site isn't as easy to navigate as it should be, but if you're persistent you can use the forums (click on Office Community in the left-hand menu), where volunteer users give expert answers. A separate Assistance area is devoted to content created by Microsoft—complete with mistakes cheerfully noted in postings on Woody's Office Portal.

### Russell Brown's Homepage [www.russellbrown.com](http://www.russellbrown.com)

Most Photoshop advice sites are so badly designed that you really have to question how valid their advice can be. This elegantly designed site, created by an Adobe staffer, provides clear, accurate tips and tutorials in QuickTime movies and Adobe Acrobat PDF files.

### Woody's Lounge [www.wopr.com/lounge](http://www.wopr.com/lounge)

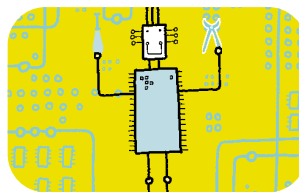
The misnamed Lounge area of Woody's Office Portal swarms with Microsoft Office workaholics who gather to answer questions and exchange tips (and Visual Basic macro code). If you want to learn a simple keyboard shortcut or get a full explanation of why your macros work differently in Word 97 than in Word 2003, this is the place to go. Other forums in the Lounge offer equally expert exchanges about Windows in general.

### WordPerfect for DOS Updated [www.wpdos.org](http://www.wpdos.org)

Haphazardly organized with spaghetti-style cross-references, this site [run by contributing editor Edward Mendelson, who wrote this review] has tips and tools that make WordPerfect for DOS run smoothly under Windows. Downloads include updated printer drivers and add-on software donated by the original authors.

### WordPerfect Universe [www.wpuniverse.com](http://www.wpuniverse.com)

Among the people who answer questions at this magnet for WordPerfect's remaining loyalists, you'll find such notable experts as the programmer who wrote the WordPerfect for Windows macro language. Almost all questions produce accurate, helpful answers. The only downside is a link page that is littered with broken links.



## HARDWARE

### PC Mechanic <http://forum.pcmec.com>

People who build or upgrade their own PCs converge on this site to trade tips and links. Topics range from professional-level configuration questions (like how to set up a RAID system with Serial ATA drives) all the way to cool time wasters (like "stealth" your CD drive by replacing its front plate with a blank rectangle that matches the color of your computer case).

### TweakTown [www.tweaktown.com](http://www.tweaktown.com)

The forums at this hardware-obsessed site overflow with

friendly, accurate answers to visitors' questions, but the most impressive postings are the answers to frequently asked questions posted at the top of most of the message lists. You may find the answer to your hardware question before you even ask it.



## MACINTOSH

### Apple Discussions <http://discussions.info.apple.com>

Don't get misled by the eye-candy design of Apple's discussion groups: This is a serious, scrappy site where Mac users complain about hardware and software problems—and usually get answers, often in the form of links to well-written posts that summarize every known fix for common Mac problems. When problems strike, start here.

### MacFixIt [www.macfixit.com](http://www.macfixit.com)

Addictive daily bulletins about newly discovered Mac problems and fixes, together with tens of thousands of archived message threads, make this an indispensable site when your Mac misbehaves. If there's no solution to the problem, at least you can be reassured that hundreds of other users are suffering in the same way.

### macosxhints [www.macosxhints.com](http://www.macosxhints.com)

This absorbing site boasts thousands of useful and ingenious tricks for all versions of Mac OS X. It is constantly updated and for the most part tested for accuracy. Meanwhile, active members post comments and additional details. Don't visit unless you have a few hours to spare for browsing.

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# Paid Support

If your computer problems won't go away, try contacting an expert.

By Jay Munro

*You've downloaded new drivers, reinstalled software, and made sure all your components are securely in place, but your system's problems haven't gone away. When you need some expert help, consider contacting a paid-support service. Such services can help you troubleshoot your system and then guide you—over the phone or via an instant-messaging application—through the steps to fix your computer.*

## Ask Dr. Tech

\$89.95 a year. Ask Dr. Tech Inc., [www.askdrtech.com](http://www.askdrtech.com). ●●●●●

Ask Dr. Tech is a full-featured technical-support service, offering phone support as well as access to diagnostics, disk tools, file tools, and other handy utilities (powered by OnTrack's family of award-winning utilities). Overall, Ask Dr. Tech is a useful service manned with competent support technicians; it was able to solve our problems relatively quickly. Unfortunately, at times we had to push a little to get the support techs to help us fix our systems.

Ask Dr. Tech offers several pricing plans, geared for home or business users. The basic \$89.95 home plan, which covers one PC, offers unlimited online and live phone support, available around the clock—except on Christmas.

To receive tech support, you dial a toll-free number; an operator takes your member-

ship information and a description of the problem. You are then told you'll receive a call back in a short while.

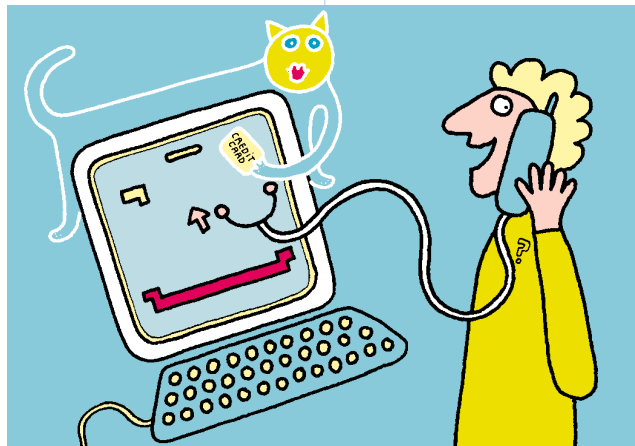
The first time we called on a midweek morning, we were on the phone with a tech within an impressive 7 minutes. During the busier

The screenshot shows a web browser window with the URL [Mech.com/pcplstip/hwaccount/computerData.asp?resid=4023725484](http://Mech.com/pcplstip/hwaccount/computerData.asp?resid=4023725484). The page has a header with "urgent care - phone treatment sign up" and "personalize my account". Below this is a form titled "about my pc" with the following fields: Manufacturer (Other), Operating System (Windows 95 or 98), Processor (Pentium Class), Internet Connection (Cable), Memory (32 MB), and Date of Purchase (Month and Year).

**When using Ask Dr. Tech, you must first provide some basic information about your computer.**

evening hours it took about 30 minutes. We were generally pleased with the service and had only one real complaint: The phone system's sound quality was poor, with technicians faint and hard to understand.

If the free utilities interest you, note that the online virus check takes you to Trend



Micro's HouseCall, and the online driver finder is powered by DriverGuide.com. These are both available free to the general public.

For our first problem, the technician asked about our printer, operating system, and computer. Our goal was to get the printer working with the USB connection, but the tech kept pushing for us to borrow or buy a parallel cable. This solution might have gotten our printer working, but the real problem was with the USB port; any other USB devices, such as a Webcam, would have also failed to work.

After we insisted that we wanted to use USB, the tech walked us through switching the cable between the two USB ports, which could rule out bad connectors. When this failed, he again tried to get us to use a parallel cable,

saying it was the only solution the database offered. He did ask if we had another USB device, and we said we had a Logitech camera but no drivers. That being the case, he decided to move on rather than testing the ports with another USB device.

We were disappointed in some of the misinformation

he gave us, such as saying that we should use not the latest driver downloaded from HP but the original driver included with the printer. The technician then said he'd have to do some research and call us back. About 15 minutes later he stepped us through removing the corrupt USB driver and reinstalling the printer. We were set to start printing after only about 26 minutes of phone time and 15 minutes of waiting for a call. The tech was patient, though a bit stilted, on the phone, and he explained the reasons for what he was telling us to do only if we asked.

When troubleshooting our second problem, removing an infestation of adware and spyware, the tech elaborated more on what we were doing, but he used a lot of jargon that a less technically minded user might not follow. He first walked us through running Ad-aware in Windows Safe Mode. We removed items in the Add and Remove Programs section and then used a second utility, CWS shredder, to double-check our system. The tech sent us this utility via e-mail and instant messenger, so we didn't have to go searching.

Like the first tech, the second was rather stiff, and he gave us some misinformation



about the interaction between Norton AntiVirus and Windows XP. Otherwise, he seemed to know his tools and his way around the system.

All in all, Ask Dr. Tech is a solid support service, offering a good assortment of tools and live help. Its phone support may not be the friendliest, but it is competent, and that's the most important thing.

## 888 Geek Help

\$1.75 per minute. 888 Geek Help, [www.888geekhelp.com](http://www.888geekhelp.com). ●●●●●

Despite any preconceived images you might have, 888 Geek Help isn't a roomful of techies in cubicles taking phone calls. Unlike the other services in this story, 888 Geek Help is staffed by technicians across the country working from their homes and small offices. It also ignores the more popular idea of subscription-based pricing in favor of a \$1.75-per-minute fee, which adds up quickly.

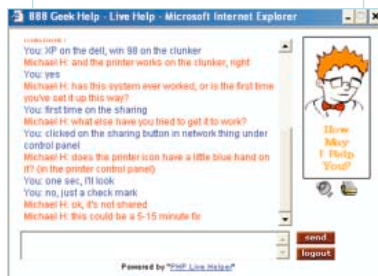
When you first call, a recording explains the service's estimate process. You are then put on hold until a technician is available. Once you get through to a live tech, the process begins: You explain your problem, get an estimate, and, if that's acceptable, give your credit card information. If your call involves a problem that another tech is better equipped to handle, you may be referred to that person. Getting through to the person with the most expertise can save you a lot of time and money, especially since an inexperienced tech may only be a page ahead of you in the manual.

For our first task, the tech said we should check for Windows updates before calling back. He said there might be some USB updates that would fix the problem.

He also suggested that we try plugging in our USB camera and downloading the new Logitech drivers to see whether that worked. This was good troubleshooting advice, but it didn't fix our problem. All of this advice was free.

We called again and got a technician who listened to the problem and said she'd call us back after consulting the database. She called 10 minutes later and said the problem was due to the HP drivers, which are "notoriously hard to install." Because 888 Geek Help couldn't help with our problem, we weren't charged. But the problem was not with the HP drivers, and this advice put us nowhere closer to solving our printer problem.

We tried one more time to get 888 Geek Help to work on this problem. This time we reached a tech who told us we needed the drivers that came with the USB board. He advised us to pull the cover off the machine, check the brand or FCC ID of the USB board, and call him back. We opened it up, found out that the USB ports were actually part of the motherboard, and called back with that information. This time we got an answering machine and left a message, but there was no follow-up. Realizing that 888 Geek Help wasn't going to solve our printer problem, we moved on to



**With 888 Geek Help, you can call or use Live Help to describe your problem to a tech and get an estimate.**

## EDITORS' CHOICE

# PC Pinpoint.com



PC Pinpoint.com is a well-rounded service that should make even the most timid of computer users comfortable. The service's three-step process starts out with an analysis utility that gathers all sorts of relevant information about your computer, such as how much memory is installed and what version of Windows you are running. When working through a problem over the phone, the technicians are friendly and knowledgeable. In testing, they successfully solved both our test problems, and they imparted very useful information along the way so we would be able to solve the problems on our own in the event of a recurrence. And PC Pinpoint is a bargain at only \$49.95 a year—a factor not to be disregarded, since support bills can really add up.

the second problem.

When we first called 888 Geek Help for assistance with our spyware-infested machine, we were put on hold for about 4 minutes. We then got a recorded message saying there was an unusually high volume of calls and we should leave a number so a technician could call us back in the order that calls were received. When we called back 4.5 hours later, we got through to a technician.

This time things went a little differently. The tech told us that the call could take 45 minutes or more if Ad-aware didn't work correctly; he also told us to perform an update and try running the utility again. We did the update, and the software worked perfectly. Since we did that while he was on the phone giving us advice, we told him that we'd go ahead with the \$1.75-a-minute charge to get the rest of the junk off the machine.

This tech was very knowledgeable and walked us through using the Windows Add/Remove Programs tool, had us run Ad-aware a second time to double-check that things were clean, and explained each step as we went along. Since we said

that our kids had mucked up the machine, he suggested we set up multiple users on Windows XP—so we could have a healthier system to work in—and pick up the book *Windows for Dummies* to get more familiar with the system. All this took just 20 minutes, yet we were billed for only 12 minutes, so the total charge was \$21 for the call.

## PC Pinpoint.com

\$49.95 a year. DMO, [www.pcpinpoint.com](http://www.pcpinpoint.com). ●●●●●

If you're looking for tech support, this is the service to use. PC Pinpoint.com relies on a well-designed three-step support process that combines an analysis program, a self-paced tutorial, and live help. The technicians are both knowledgeable and friendly, and in our case they gave us some troubleshooting tips to try before they even started billing us. To top it off, PC Pinpoint has the most reasonable price: \$49.95 a year per machine. A one-week trial is available for \$14.95.

To sign up, you fill out a simple online form, which asks for your name and billing information. You can enter your credit card online or call an 800 number to give it to a live person (a good option for

people who suspect their systems have spyware or other malicious code installed).

After paying, you log on to the support site and download the analysis program. The utility runs a thorough check of your system, analyzes your hardware and software configuration, and displays a report. This is extremely helpful if you don't know what kind of CPU you have or how much memory is in your PC.

You're then directed to try to solve your problem using wizards, which don't overwhelm you with complicated tasks; they cover only common problems. More involved tasks need live tech support.

You can work with a technician either on the phone or through the service's instant-messenger app. We tried both but, not surprisingly, preferred voice to text chat. The IM viewer had difficulty refreshing; it required us to right-click and refresh every line to see the tech's comments.

The techs are very knowledgeable and can look beyond the database when troubleshooting. For our USB

printer task, PC Pinpoint was the fastest service we reviewed, fixing our problem in 23 minutes. The tech quickly walked us through removing and reinstalling drivers, and he explained what he was doing at every turn. Knowing Windows 98 idiosyncrasies, he went directly to both the printer and the USB driver, and he knew better than to trust the "device working ok" message in the Device Manager. We were quite impressed with how he went straight after the actual problem.

For our second task, we called the help number first—starting a new account for a new machine—without logging on to the site, since we were worried about spyware on our system. The technician's first suggestion was that we run an antivirus program and retry Ad-aware on our own before paying for a PC Pinpoint subscription. She



The first step in troubleshooting with PC Pinpoint.com is to run a utility that analyzes your computer.

even gave us a link to a free virus scanner, AVG Anti-Virus ([www.grisoft.com](http://www.grisoft.com)). Unfortunately, scanning with Ad-aware failed again, so we called PC Pinpoint back. After giving our credit card on the phone, we headed to the Web site to download the analyzer.

Once the system analysis was done, we decided to try contacting PC Pinpoint using the IM client. Again the tech was knowledgeable, but the explanations were briefer than and not quite as educational as over the phone, since we were typing short messages back and forth.

The tech did walk us through obtaining and using

several spyware utilities, as well as using the Add and Remove Programs tool in the Windows Control Panel. He suggested running utilities in safe mode to avoid problems where spyware may try to dodge deletion or report back to a Web site. Additionally,

he explained the need to use more than one spyware remover, since a single tool is more likely to miss something. The session took a leisurely 45 minutes, but we got our machine clean and learned how to keep it that way.

### SpeakWithAGeek.com

\$34.95 a month. SpeakWithAGeek, [www.speakwithageek.com](http://www.speakwithageek.com). ●●●●●

Starting at \$34.95 a month, SpeakWithAGeek.com offers unlimited phone support for home or business users, at a price far higher than that of competitors like PC Pinpoint.com. Unlike other services, SpeakWithAGeek lets you list two machines on the consumer plan.

Your call goes to a dispatcher, who takes a description of your problem. A technician then returns your call and has you download a remote-control program called Jaunt; this allows the tech hands-on control of your machine. Tech24.com is the only other service that uses a remote-control app. If possible, you should talk to the tech on the phone while the tech has access to your system; if you use a dial-up connection with no second line, you can use Jaunt's instant messenger.

After contacting SpeakWithAGeek with our first problem, we waited about 10 minutes before a friendly and helpful geek called us back.

## SCORECARD



In reviewing the paid-support services, we've rated key factors that will be important to most users trying to solve computer problems. The **technical knowledge** rating reflects the depth of expertise that the techs who worked with us offered when troubleshooting and fixing our problems. The **speed** rating indicates how quickly they supplied the right diagnoses and resolved the problems.

The **instruction** rating represents how well the techs helped solve the problems, how much detail they offered, and whether they imparted enough knowledge that a caller could fix the same problems again independently if necessary. The last category, **self-help tutorials and utilities**, involves the quality of information and software on the site to help you solve problems without having to contact the service for live support.

	Technical knowledge	Speed	Instruction	Self-help tutorials and utilities	OVERALL
●●●●● - EXCELLENT					
●●●● - VERY GOOD					
●●● - GOOD					
●● - FAIR					
● - POOR					
<b>Ask Dr. Tech</b>	●●●●	●●●●●	●●●	●●●●●	●●●●
<b>888 Geek Help</b>	●●●●	●●●	●●●●	N/A	●●●
<b>PC Pinpoint.com</b>	●●●●●	●●●●●	●●●●	●●●●	●●●●
<b>SpeakWithAGeek.com</b>	●●●	●●●	●●●●	N/A	●●●
<b>Tech24.com</b>	●●	●●	●	●●●	●

RED denotes Editors' Choice. N/A—Not applicable: The product does not have this feature.

## PERFORMANCE TESTS

# How We Tested



To test the paid-support services, we created two reproducible, fairly common computer problems and contacted each service for help. Our two scenarios were, first, a problem installing a USB printer on an older Windows 98 computer and, second, an effort to clear spyware, adware, and other unwanted programs from a system running Windows XP. Both problems were solvable and, in fact, could be solved in a relatively small amount of time.

To ensure that our test systems were identical when we called each support service, we used Symantec's Norton Ghost to create an initial image of both of our "problem" systems. To reflect the real world, we incorporated a mix of newer and older hardware and software on both systems.

## PROBLEM 1: MY PRINTER DOESN'T WORK

It's a familiar situation: Someone inherits an old computer that has seen better days, and now it needs some TLC. For the USB printer problem, we used an old no-name PC with a Pentium 233 MMX, 32MB of RAM, and a 3GB hard drive.

We were attaching an HP DeskJet 932C color printer, using a USB port. We downloaded the latest printer drivers from Hewlett-Packard's site and installed them, but the printer still did not work. The real problem, which is common under Windows 98, was a corrupt USB driver.

The trick with this scenario was that the Windows Device Manager said the device was working properly. In fact, when we plugged an unpowered digital camera into the USB port, its lights lit up and the hardware appeared to be working—but the camera wasn't recognized by any applications.

The fix, once you have diagnosed the problem, is simple:

Delete the USB drivers from the Device Manager, reboot the machine, and reinstall the printer drivers. Windows will then load clean USB drivers and detect the printer.

## PROBLEM 2: REMOVE THAT SPYWARE

In this situation, the problem was man-made. We started with a Dell Dimension 4100 (a 1-GHz machine), 512MB of RAM, and Window XP Professional (with all patches applied). The system had been to all the seediest corners of the Web and was loaded with some of the worst code you can pick up there: dialers, spyware, search bars, file-sharing apps, browser hijackers, and free programs. The result: We could not so much as boot the system before purple monkeys and gambling offers started popping up all over our desktop.

We told the techs at each support service that overzealous kids were the cause of the condition. The fix was to use Lavasoft's Ad-aware or another spyware cleaner, as well as uninstalling some programs through the Windows utility Add or Remove Programs. But again we threw in a curve ball. If you downloaded the latest version of Ad-aware without updating it, it would hang when you tried to delete a lot of objects. The app worked fine, though, once you did an update. This was mainly to see whether the techs were thorough enough to have us update the utility—and whether they could go a step further and get us past the "hanging" problem.

The results were surprisingly varied, both in how quickly we were able to solve the problems and in how much we were charged. Bear in mind that though our experience with each service is a decent indicator of what to expect, you're likely to experience different times, costs, and solutions depending on your specific problem. —*Analysis written by Jay Munro*

## PAID SUPPORT

	Price structure	USB PRINTER PROBLEM			SPYWARE PROBLEM		
		Solved	Time	Cost	Solved	Time	Cost
<b>Ask Dr. Tech</b>	\$89.95 annual subscription	Yes	26 minutes	Subscription	Yes	48 minutes	Subscription
<b>888 Geek Help</b>	\$1.75 per minute	No	10 minutes	\$0.00	Yes	20 minutes	\$21.00*
<b>PC Pinpoint.com</b>	\$49.95 annual subscription	Yes	23 minutes	Subscription	Yes	45 minutes	Subscription
<b>SpeakWithAGeek.com</b>	\$34.95 monthly subscription	Yes	35 minutes	Subscription	Yes	1 hour	Subscription
<b>Tech24.com</b>	\$19.95 per inquiry	Yes	105 minutes	\$19.95	No	3 hours	\$19.95

RED denotes Editors' Choice. \* Billed for 12 minutes.

◀ **Forget the old saying,** "You get what you pay for." PC Pinpoint.com, the Editors' Choice in our story, offers the best support as well as the most reasonable price among the services we tested.

We discussed the problem briefly, and then he connected to our machine. We told him we had already downloaded the HP drivers to the Windows desktop, but he seemed to have trouble finding them. He finally used My Computer to copy the drivers into the My Documents folder. Evi-

dently he wasn't very familiar with the Windows 98 file structure; he didn't know the desktop was located at C:\Windows\Desktop.

He also gave a bit of misinformation, telling us that Windows 98 doesn't detect USB drivers. We really started to doubt his abilities after he

first set the driver to see the printer on the LPT1 port and then tried adding the USB port manually. After more groping around, he deleted the USB port driver, rebooted, and managed to get it working. The whole process took about 35 minutes.

For our second task, we

waited about 25 minutes for a call back from a technician. Again, we downloaded Jaunt and started working. We were impressed by our tech's knowledge; he immediately updated Ad-aware, which stopped it from hanging when trying to delete spyware. The technician cleared

out a lot but not all of the problematic code. He then downloaded and ran SpyBot Search & Destroy to delete even more.

Throughout the entire session our geek explained what he was doing and why. He suggested we get Grisoft's free AVG Anti-Virus, then scan with SpyBot and Ad-aware every two weeks. Besides fixing our problem, he helped us install the Google toolbar to block pop-ups. We were most impressed with his explanation and demonstration of SpyBot's immunization feature, which creates dummy files to trick spyware into thinking it has already been installed on your PC.

Tech support at Speak-WithAGeek seems to be hit-or-miss. While the service is more expensive than Ask Dr. Tech or PC Pinpoint.com, SpeakWithAGeek's use of remote control with live phone support is a potentially powerful combination.

**Tech24.com**

\$19.95 per inquiry. Tech24 Inc., [www.tech24.com](http://www.tech24.com).

Sadly, there just aren't a lot of nice things to say about Tech24.com. Perhaps our biggest complaint is that we never were able to get live phone support. The company claims to offer phone support in case you can't connect, but at the time we tested there were no phone numbers to be found. As a partner service with Microsoft, Symantec, and a few other companies,

Our contributors: **Jay Munro** is a frequent contributor to *PC Magazine*, and **Edward Mendelson** is a contributing editor. Associate editor **Matthew P. Graven** was in charge of this story.



SpeakWithAGeek.com combines live phone support with a remote-control agent.

Tech24.com uses a remote desktop system almost exclusively to fix your problems.

To get support, you log on to the service from the machine that is giving you problems. You are then greeted by a technician (located in either India or Rochester, New York) armed with a tech-support database. Commandeering your machine, the tech attempts to fix your problem. There is very little interaction once the session starts; in fact, depending on the problem, the instant-messaging window tends to be covered by other windows. Unfortunately, the technicians don't always seem to be aware of this, and you may experience pauses while they wait for input from you.

The techs themselves are polite and try to be helpful but seem inadequately trained. Unlike the techs at PC Pinpoint.com and SpeakWithAGeek.com, Tech24.com's techs appear to know only what their database tells them. The site also provides some self-help material, a fairly well-stocked driver and DLL database, a link to online

virus scanning, and a free 30-day trial for an online backup service.

For our first task, we spent 3 hours with four different techs yet accomplished nothing. During the procedure we had to reboot, and a problem on Tech24.com's system kept giving us a new tech each time we reconnected.

Frustratingly, each tech walked us through exactly the same procedure, right up to the reboot.

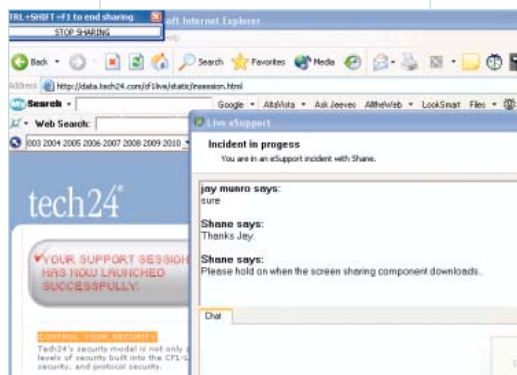
To give the company the benefit of the doubt, we tried again a week later. This time we got a tech who went through the problem, rebooted our PC, and successfully rejoined us to finish the solution. Still, the tech spent a fair amount of time looking at things that had little to do

and he clicked individually on each and every one (he could have just right-clicked and chosen Select All). After unsuccessfully trying to remove all the spyware and other unwanted programs, he told us we'd have to reformat the machine and lose our data.

Tech24.com claims to offer a money-back guarantee. Still posing as a general user, we contacted customer service for a refund, but we never heard back. We finally wrote to the company's PR department (revealing our identity), and CEO Kirkland Desmond contacted us. He said Tech24.com was in the process of replacing its old software and outsourced tech centers with new software and company-owned centers, and all its external mail (including our refund request) had been lost.

Because the company said it was updating the system, we tried one more time, but the

system appeared to have gone down again. We got no support, yet Tech24.com did manage to charge our credit card. After spending 3 hours on hold as the number-two call in the queue, we gave up. We had paid for 6 hours of tech time, and we assumed the billing wouldn't start until we actually chatted



Lacking phone support, Tech24.com can be reached only with the service's proprietary chat client.

with the solution. And at 1 hour 45 minutes, the process took far longer than with other services.

When dealing with our spyware-loaded machine, a tech (from our first 3-hour session) tried to walk us through using Ad-aware to clean up our cluttered computer. Unfortunately, he didn't know how to use the utility. We had 600 objects to delete,

with a technician. When we logged on the following day, to our surprise our \$19.95 credit was gone.

According to Desmond, the new tech centers had been operational for only three weeks, and the staff was still a bit green. Nevertheless, this service needs to fix some of its own problems before it tries to fix problems for the public. ☰



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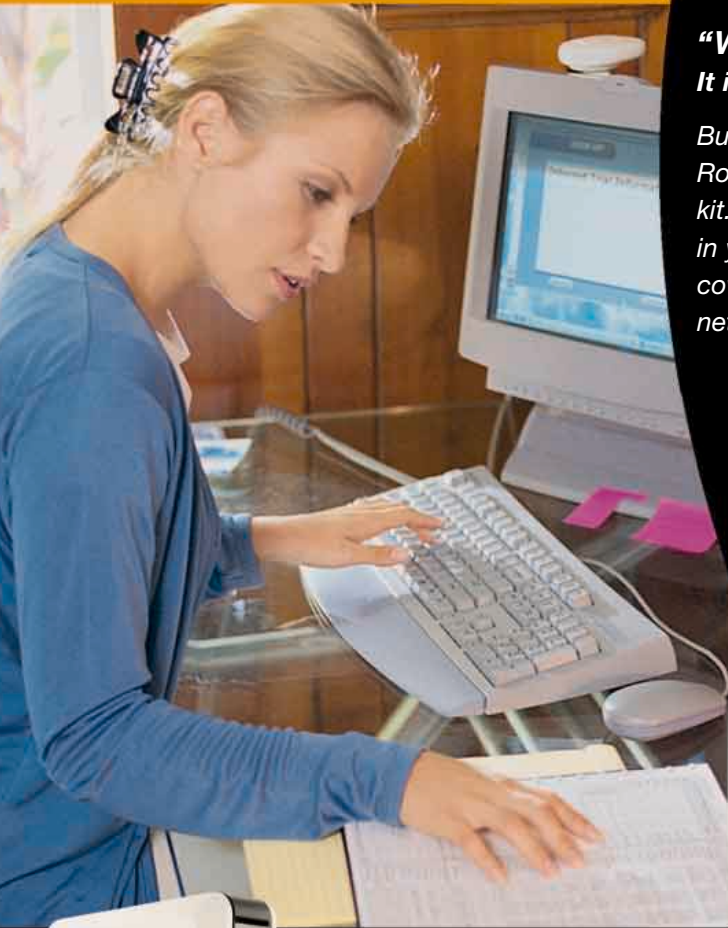
*—Keith Morrow, CIO, 7-Eleven, Inc., U.S.*

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\*Repeater function works with Buffalo Access Points and Routers only, but can communicate with other manufacturers’ 802.11b and 802.11g client adapters. \*\*Laptop Magazine December 2003 issue – applies to WLA-G54C repeater only.

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## HOME NETWORKING

# From THE Ground Up

With blueprints in hand, we give the new home of contributing editors Bruce and Marge Brown a networking makeover. See what technologies we recommend for their home—and yours.



### Second Floor



### First Floor



## IN THIS STORY

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BY STEPHANIE CHANG  
ILLUSTRATIONS BY RON CHAN

When *PC Magazine* contributing editors Bruce and Marge Brown announced late last year that they were moving from Hartford, Connecticut, to Wilmington,

North Carolina, a light went on in their heads and ours—okay, just ours. Their new house would need a networking makeover, and who better to dream up the perfect networked home than the editors of *PC Magazine*? Truth be told, Bruce and Marge hardly need our help; they're networking experts themselves. But fortunately, they're also fans of the TLC show *Trading Spaces*, so they indulged us by sending along a blueprint and a list of their needs.

They want their home network to connect their multiple PCs and entertainment devices, as well as their home security system. And of course, they want Internet connectivity throughout their property—from the foyer in front to the boat dock out back.



**COUCH SURFING:** Bruce and Marge Brown peruse the Web in their living room, as Pepper considers other matters.

We've devised a plan that mixes old equipment with new, wired technology with wireless, and traditional networking with contemporary. Given the layout and construction of the Browns' new home, we were able to take advantage of four core technologies: wired Ethernet, wireless Ethernet, power-line networking (also known as HomePlug), and phone-line networking (also known as HomePNA, or HPNA). Our recommendations for the Browns may not work for your home or apartment, so throughout this story we offer alternative technologies and hardware.

The following pages take you on a tour of Bruce and Marge's home and discuss the networking possibilities of the home office, living room, two upstairs bedrooms, and kitchen, as well as the backyard and boat dock. We also offer starter tips on how to configure the network settings on your PC, and we present the results of our performance tests on the various networking technologies. But for starters, take a look at our glossary below to brush up on home networking lingo.

# Glossary

**Access point (AP)** ))) A device that acts as a bridge between a wired and a wireless network. In this story, the term refers to a standalone AP. While in many cases an AP is shaped like a home router, it usually has only a wireless radio receiver and transmitter on-board for exchanging data with wireless desktop PCs, laptops, PDAs, and printers.

**DHCP (Dynamic Host Configuration Protocol)** ))) A specification for the service provided by a router, gateway, or other network device that automatically assigns TCP/IP network settings (including an IP address to any device that requests one).

**802.11a, 802.11b, 802.11g** ))) Three IEEE substandards for wireless local area network (WLAN) technologies. These provide for varying theoretical transmission speeds of 10 to 54 Mbps, which translate to actual throughputs of roughly 4 to 20 Mbps. (To learn about the differences among "a," "b," and "g" technologies, see our feature story "Unwire Your Home," Fall 2003.)

**Ethernet** ))) The most popular LAN communication technology. Originally designed in the 1970s for coaxial cable, it is now most frequently used with Category 5 twisted-pair cable. All nodes or networked devices take turns sharing the technology. Because of this, various collision detection techniques are

used, making the technology efficient for small networks. There are various types of Ethernet, including 10-Mbps (traditional Ethernet), 100-Mbps (Fast Ethernet), and 1,000-Mbps (Gigabit Ethernet).

**Hosts** ))) PCs, networkable printers, and multimedia devices, among other hardware, that can send or receive data across a network.

**IP (Internet Protocol) address** ))) A numerical identifier for a device on a TCP/IP network. The IP address format is a string of four numbers, each from 0 to 255, separated by periods.

**MAC (media-access control) address** ))) A preassigned 48-bit network address that is unique to a given network interface card and can be used to identify networked devices for security purposes.

**Media receiver** ))) A device that streams audio and in some cases video signals from computers to TV sets or stereo systems via wired or wireless Ethernet.

**NAT (Network Address Translation)** ))) A technique—generally applied by a router—that makes many different IP addresses

# Home Networking Technologies Compared

Consider the pros and cons of each technology before choosing one for your home network.

	WIRED				WIRELESS		
	Fast Ethernet	Gigabit Ethernet	Phone-line	Power-line	802.11b	802.11g	802.11a/g
Cost per PC	\$20	\$26-\$35	\$40-\$60	\$99	\$30	\$50-\$100	\$100
Cost of basic AP, bridge, router, or switch	\$40-\$100 (switch)	\$100-\$200 (switch)	\$150 (broadband router)	\$87-\$120 (bridge)	\$40 (AP or router)	\$100-\$130 (AP or router)	\$200-\$300 (AP or router)
Cabling requirements	Category 5 or 5e (7¢-30¢ per foot)	Category 5 or 5e (7¢-30¢ per foot)	None	None	N/A	N/A	N/A
Operational frequency	N/A	N/A	N/A	N/A	2.4 GHz	2.4 GHz	"a," 5 GHz; "g," 2.4 GHz
Theoretical maximum throughput	100 Mbps	1,000 Mbps	HPNA 2.0, 10 Mbps; HPNA 3.0, 128 Mbps*	14 Mbps	11 Mbps	54 Mbps	54 Mbps
Actual expected throughput	50-60 Mbps	500-600 Mbps	4-6 Mbps	4-6 Mbps	4-6 Mbps	15-20 Mbps	15-20 Mbps
Pros	Mature technology; inexpensive devices.	Fastest technology available.	Inexpensive; no additional wiring needed.	No additional wiring needed; operates on existing power sockets (usually found in every room); can be used to extend wired or wireless networks.	Inexpensive; no wiring needed; very flexible; offers good range.	Backward-compatible with "b" devices; greater throughput than "b" devices.	Combo devices allow greater throughput and user density than "g"-only devices.
Cons	Category 5e wiring required; not portable; expensive to install (requires structured wiring); unsightly when wires are run along floors.	Same as for Fast Ethernet. Also, few products currently available; peripherals must be compatible to realize throughput speeds.	Requires a nearby phone jack (typically not located in every room); all jacks must be on the same line.	Expensive; may experience interference.	Lower throughput than "a" or "g" wireless solutions.	Less client compatibility than "a/g" devices.	Expensive.

N/A—Not applicable: The technology does not use this method. \* HPNA 3.0 is not yet available.

on an internal network appear to the Internet as a single address, concealing the specifics of the internal network.

**Personal video recorder (PVR)** ))) A device that records TV shows from broadcast, satellite, or analog or digital cable TV signals. Standalone PVRs are available, but multimedia PCs also offer this technology, as do graphics cards that can be installed in regular PCs.

**Phone-line** ))) A standard set up by the Home Phonline Network Alliance ([www.homepna.org](http://www.homepna.org)). The HPNA 2.0 specification permits 10-Mbps network connections over existing phone wiring without interfering with normal use. An HPNA 3.0 spec calling for higher-speed networking is under consideration.

**Power-line** ))) A networking technology that uses a home's electrical wiring to carry data at a maximum throughput of 14 Mbps. Power-line products adhere to the HomePlug 1.0 specification.

**Print server** ))) A device that enables printer sharing on a network. Some home router products offer built-in print servers, and many standalone wired and wireless print servers are available.

**Residential or home gateway** ))) A router used in homes and offices that typically includes such features as a cable or DSL modem, a DHCP server, a firewall, a four-port switch, a print server, or a wireless access point.

**Router** ))) An interconnection device that links two discrete networks and forwards packets between them. A router uses a networking protocol such as IP to address and direct data packets flowing into and out of the network on which it sits.

**Stateful packet inspection (SPI)** ))) A firewall technology that examines the content of packets to determine whether they will be given access to a network.

**Structured wiring** ))) A networking system that requires the installation of networking cables within the walls of a home or office. The cables can be Category 5, coaxial, or hybrid bundles. Structured wiring is more common in new homes, because retrofitting old homes can be costly.

**Switch** ))) A hardware device that serves as a central connection point for all network cables. In a relatively small networking environment, a switch of 4 to 12 ports may be part of a router or gateway.

**T**he heart of the Browns' home network is in this room, which will mainly serve as Marge's office. (Bruce will split his work time between this room and a second office upstairs.) Since most of the printing, scanning, and faxing will be done here, not to mention the majority of the e-mailing and Internet browsing, they will stock this room with productivity devices, including two desktop PCs, a printer, and a fax machine. Network availability is key here, so understandably, they want to keep the core equipment in this room.

## CONNECTIVITY

**Wired Ethernet** )))) The home office is where the Browns' Internet connection originates. Connectivity begins with a wired Ethernet network, using Category 5e cables (*Cat 5e*, for short), to connect the broadband cable modem with the network router. Because the house has a crawl space for access to the wall cavities, we recommend structured wiring in several key rooms, such as the office. With such wiring, the Ethernet cables run inside the walls, terminating in faceplates with RJ-45 jacks.

Structured wiring is most affordable for new homes like the Browns', where wires can be placed in the walls as they're being built. Structured wiring may not be an option if you live in an older home or an apartment in which the insides of the walls aren't accessible or drilling isn't an option. You may have to go the less aesthetically pleasing route of running cables along the floor.

**Wireless** )))) The Browns want connectivity throughout their home, but because structured wiring in every room isn't affordable, we recommend adding 802.11 wireless technology to this network. While a wireless connection can't outpace a Fast Ethernet wired connection in terms of raw throughput, it is fast enough for most everyday needs. And it sure is convenient: no wires to run or cables to hide.

Depending on the wireless specification you choose (most likely 802.11b or 802.11g), throughput should be at least 4 Mbps. But throughput can vary greatly based on the distance between a wireless-enabled device and your network's access point or router. In addition, the materials used in your walls and floors can interfere with wireless signals. Most walls in single-family homes and apartments are made of drywall or wood, which don't usually pose a problem.

### **A WIRELESS ROUTER WITH BUILT-IN FOUR-PORT SWITCH AND FIREWALL**

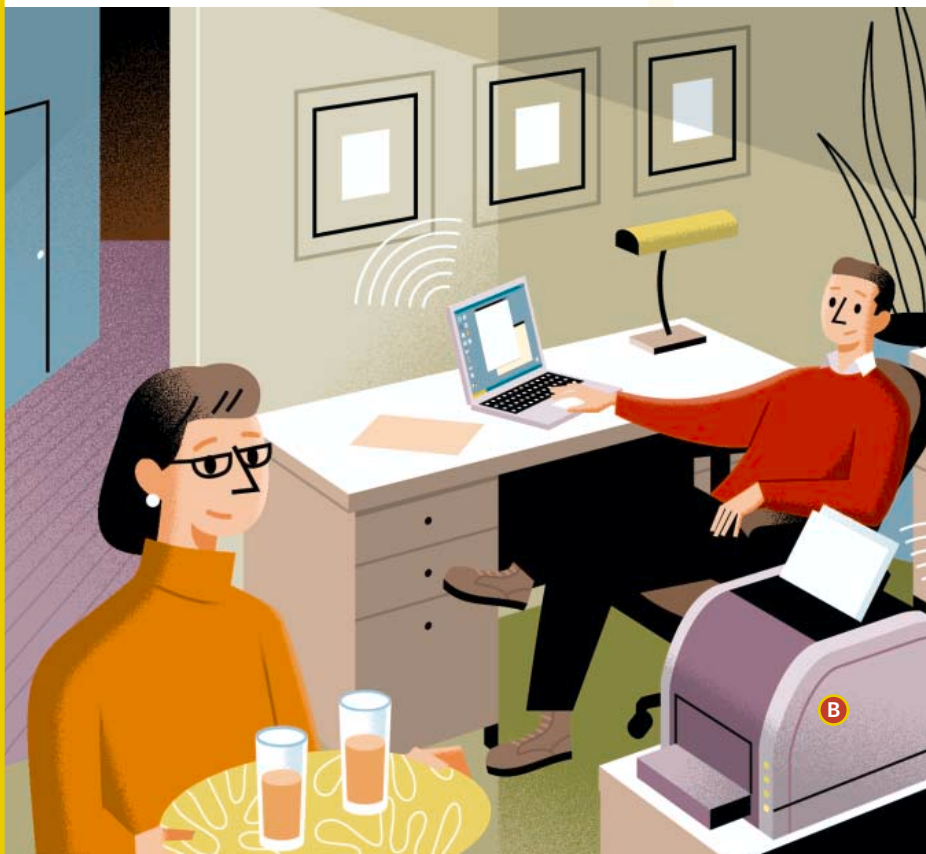
Sharing a broadband connection, as well as files on a local network, requires a **router**. The Browns' cable modem doesn't include one, so we recommend a multifunction wireless router that includes a four-port switch and firewall.

The included **firewall** prevents intruders from accessing the Browns' network; we recommend firewalls with stateful packet inspection (SPI) technology. The four-port **switch** lets the Browns connect four devices to their network via Ethernet cables. And the wireless aspect of the device is an **access point**, which uses wireless signals to connect more wireless-enabled devices to the network, such as notebooks.

#### PRODUCTS

- ))) D-Link DI-624 AirPlus Xtreme G Router, \$100 street. D-Link Systems Inc., [www.dlink.com](http://www.dlink.com). (Reviewed February 3, 2004. ●●●●●)
- ))) Linksys Wireless-G WRT-54G, \$120 list. Linksys Group Inc., [www.linksys.com](http://www.linksys.com). (Reviewed Fall 2003. ●●●●●)
- ))) Netgear WGT624 Router, \$130 street. Netgear Inc., [www.netgear.com](http://www.netgear.com). (Reviewed February 3, 2004. ●●●●●)

# Home Office



**B PRINT SERVER** • Since the Browns' home has more than one PC, providing network access to their printer is a good idea. Though this can be accomplished through the print-sharing feature in Microsoft Windows XP, this requires leaving a PC on and connected to the printer at all times. A hardware print server performs the same task without much configuration effort. Homes with wireless networks should consider a wireless print server, so family members can print from wherever they have wireless connectivity in the house. HP has also introduced two printers that have wireless servers built-in.

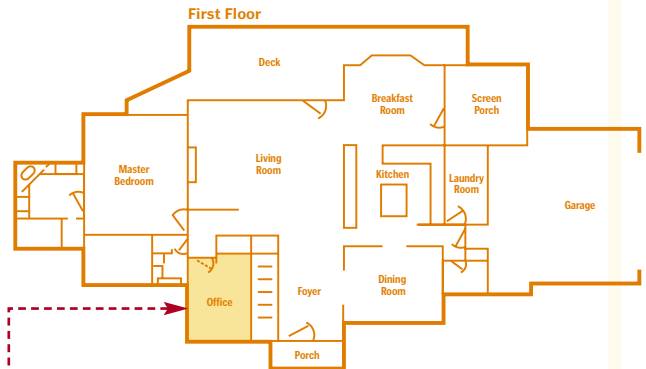
## PRODUCTS

### Wireless print servers

- »»» Belkin F1UP0001, \$130 list. Belkin Corp., [www.belkin.com](http://www.belkin.com).
- »»» D-Link DP-311P, \$139 direct. D-Link Systems Inc., [www.dlink.com](http://www.dlink.com).
- »»» HP Deskjet 5850 printer with built-in wireless server, \$249.99 direct; PSC 2510 Photosmart All-In-One, \$399. Hewlett-Packard Co., [www.hp.com](http://www.hp.com). (PSC 2510 reviewed November 25, 2003. ●●●●●)
- »»» Linksys WPS54GU2, \$140 street. Linksys Group Inc., [www.linksys.com](http://www.linksys.com).

### Wired print servers

- »»» D-Link DP-313, \$199 direct. D-Link Systems Inc., [www.dlink.com](http://www.dlink.com).
- »»» Netgear PS101, \$75 street. Netgear Inc., [www.netgear.com](http://www.netgear.com).



**C CABLE/DSL MODEM** • Like the homes of 75 percent of *PC Magazine* readers, the Browns' house has a broadband connection. The two main types of broadband for home users are *digital subscriber line* (DSL), which provides high-speed Internet access using existing phone wires, and *cable*, which uses the same coaxial lines as your cable television.

Each technology has pros and cons. On cable networks, bandwidth is shared among several households, so throughput can decrease significantly in densely populated areas. DSL usually guarantees a base bandwidth rate in the service contract and allows for static IP addressing and higher configurability. But DSL is available only to those who live within a certain distance of their telephone company's central office.

For both DSL and cable service, the modems are usually supplied by the provider for a monthly fee, though some let you use a separately purchased third-party device. Many of the newest modems from both third parties and broadband providers are multifunctional, including such features as a router and firewall.

**D FIVE-PORT SWITCH** • Though multifunctional routers usually include four-port switches, the Browns may need an additional switch to accommodate more wired devices. Most home users will find the throughput of a **Fast Ethernet** (10-/100-Mbps) switch adequate, but those who work with large files may want to consider a **Gigabit Ethernet** (10-/100-/1,000-Mbps) switch, which is much faster but also much more expensive.

## PRODUCTS

- »»» D-Link DSS-5+ (Fast Ethernet), \$34 direct; GigaExpress DGS-1005D (Gigabit Ethernet), \$129. D-Link Systems Inc., [www.dlink.com](http://www.dlink.com).
- »»» Linksys SD205 (Fast Ethernet), \$40 street; EG005W (Gigabit Ethernet), \$150. Linksys Group Inc., [www.linksys.com](http://www.linksys.com).
- »»» Netgear FS605 (Fast Ethernet), \$40 street; GS105 (Gigabit Ethernet), \$100. Netgear Inc., [www.netgear.com](http://www.netgear.com).



Our contributors: **Bruce Brown** is a contributing editor of *PC Magazine*. Executive editor **Stephanie Chang**, associate editor **Davis D. Janowski**, and *PC Magazine* Labs lead analyst **Oliver Kaven** were in charge of this story.

**A PVR (PERSONAL VIDEO RECORDER)** • A PVR will keep track of the Browns' favorite shows and movies and digitally record them; it will even let them watch the beginning of a show while it's still recording the ending. Some PVRs can be connected to a network, so that updated program guides can be retrieved from the Internet. There are also graphics cards, such as the ATI model listed below, that can turn your PC into a PVR.

#### PRODUCTS

- »»» ATI All-In-Wonder 9800 Pro, \$450 street. ATI Technologies Inc., [www.ati.com](http://www.ati.com). (Reviewed at [www.pcmag.com](http://www.pcmag.com). ●●●●●)
- »»» Panasonic DMR-E100, \$1,200 street. Matsushita Electric Corp. of America, [www.panasonic.com](http://www.panasonic.com). (Reviewed at [www.pcmag.com](http://www.pcmag.com). ●●●●●)
- »»» TiVo Series 2, \$350 street, plus \$12.95 monthly subscription fee. TiVo Inc., [www.tivo.com](http://www.tivo.com). (Reviewed February 17, 2004. ●●●●●)

**B MEDIA RECEIVER** • This device (also known as a media hub or media adapter) lets the Browns stream digital audio, photos, and video files from a file server or PC to their stereo system or TV set. Most media receivers can access files from any networked PC in the house, while others can access files only from one location. Many media receivers can also stream programming from Internet radio stations. In most cases, such a device is connected to a TV set or monitor, where the interface is displayed and is navigable via remote control. Many media receivers offer both wired and wireless connectivity. We recommend the Browns keep their receiver wired because of the faster throughput needed to play large media files—particularly video.

#### PRODUCTS

- »»» Linksys Wireless-B Media Adapter (802.11b), \$200 street. Linksys Inc., [www.linksys.com](http://www.linksys.com). (Reviewed Fall 2003. ●●●●●)
- »»» Prismiq MediaPlayer, without wireless card, \$249.95 direct. Prismiq Inc., [www.prismiq.com](http://www.prismiq.com). (Reviewed Fall 2003. ●●●●●)
- »»» SMC EZ-Stream Universal Wireless Multimedia Receiver SMCWMR-AG (802.11a/g), \$250 street. SMC Networks Inc., [www.smc.com](http://www.smc.com). (Reviewed February 17, 2004. ●●●●●)

**C FILE SERVER** • Keeping all of your audio files, digital photos, and video files in one location is ideal; this makes it easier for a media receiver to access them. If you have room on one of your PCs to store all of your multimedia files, then a dedicated file server isn't necessary. But we recommend one for the Browns, because they have a large and growing collection of such big files.

Since servers usually run 24/7, produce a lot of noise (because of the fans), and generate a lot of heat, we recommend that they be placed in a remote location, such as the garage loft in the case of the Browns' house. We also recommend that the server be hard wired to the network.

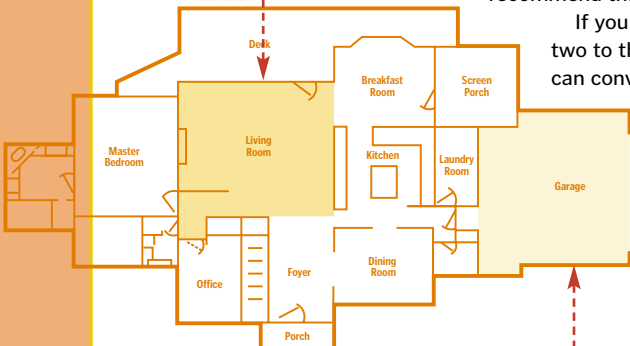
If you have an old PC lying around—and we mean two to three years old, not an ancient machine—you can convert it to a file server by adding a larger hard drive (either internal or external) and more memory. (To learn how to convert an old PC to a file server, visit [www.pcmag.com/homenetworking](http://www.pcmag.com/homenetworking).) If you'd rather save yourself the effort, consider buying a file server.

#### PRODUCTS

- »»» Dell PowerEdge 2600, \$1,700 direct. Dell Inc., [www.dell.com](http://www.dell.com).
- »»» Mirra Personal Server M-120, \$499 direct. Mirra Inc., [www.mirra.com](http://www.mirra.com). (Reviewed January 20, 2004. ●●●●●)



First Floor



# Living Room



Nothing says *home* more than the living room. This room serves as the entertainment center of the Browns' house, where they watch movies, listen to music, watch TV, or just hang out. The Browns have many MP3s, photos, and videos on their PCs, so they want to be sure they can access all of their media files from the comfort of their living room. They also want Internet access here, in case one of them wants to do some work on the couch with a laptop. The existing equipment in this room is a TV, a stereo system (with a receiver, speakers, and a CD/DVD player). This room also contains their large CD and DVD collection.

## CONNECTIVITY

**Structured wiring** )))) This is our delivery method of choice to connect the living room to both the first-floor office, which hosts the Internet connection and serves as the network's core, and the garage loft, where the multimedia file server is located. And the throughput capacity of Cat 5e cable is more than sufficient for current and future needs. But we're also taking advantage of the wireless router in the office to communicate with the wireless media receiver and to let the Browns connect to the Internet wirelessly from their laptops while lounging on the couch.

**Wireless** )))) The signal of the wireless router in the office next door is strong enough to carry into the living room. But if the router were on the other side of the house and there were several walls (or a floor) between the two rooms, a wireless access point, wireless repeater, directional antenna, or signal booster might be necessary to extend the wireless signal to the living room. (See page 108.)

## DEVICE ALTERNATIVES

**MULTIMEDIA PC** • A computer specifically designed with audio, video, and photo playback in mind can serve as a PVR, media receiver, and DVD/CD player all in one. Most major manufacturers offer models with Microsoft Windows XP Media Center Edition, though some, such as Asus and Sony, offer proprietary media-centric software. (Sony also offers a PC that uses Windows Media Center; details below.)

The couch-friendly interface and remote control make Media Center PCs seem at home in living rooms. But the reliability and video quality of Media Center PCs used as PVRs aren't yet as impressive as those of standalone PVR devices.

## PRODUCTS

- ))) Gateway Media Center FMC-901X, \$1,799 direct. Gateway Inc., [www.gateway.com](http://www.gateway.com). (Editors' Choice, reviewed February 3, 2004. ●●●●●)
- ))) HP Pavilion m370n, \$2,050 direct. Hewlett-Packard Co., [www.hp.com](http://www.hp.com). (Editors' Choice, reviewed November 25, 2003. ●●●●●)
- ))) Sony VAIO Digital Studio PCV-RZ46G, \$2,200 direct. Sony Electronics Inc., [www.sonymstyle.com](http://www.sonymstyle.com). (Reviewed February 3, 2004. ●●●●●)

## MORE ON THE WEB

For full reviews of many of the products mentioned in this story, go to [www.pcmag.com/homenetworking](http://www.pcmag.com/homenetworking).

# The Software Side: Configuring Your PCs for a Network

Once you've selected the hardware you need and the type of technologies you want to use for your network, you may think you're ready to roll. Not quite yet. You still need to configure the client machines so that they can communicate with each other on your network. The following are some tips on how to get started.

## PROTOCOL BASICS

Protocols are sets of rules networked PCs use to specify data format and transmission parameters. For Microsoft Windows XP (Home and Professional) or Mac OS X, the most common protocol in today's networks is TCP/IP. A client machine is identified by an IP address—a numeric identifier for each networked PC and device. IP addresses are assigned either manually or more commonly by using dynamic addressing through DHCP (Dynamic Host Configuration Protocol). Turning on DHCP on your broadband router will make your life much easier, because the process is automatic.

If you have a Windows XP system, you should make sure you're set up for TCP/IP. You can do so by right-clicking on *My Network Places*, choosing *Properties*, highlighting *Local Area Connection*, right-clicking on and selecting *Properties*, then clicking on *Internet Protocol (TCP/IP)* to verify that the box is checked to use the protocol. Then click on *Properties* and verify that the box *Obtain an IP address*

*automatically* is checked. You should also make sure that *Obtain DNS server address automatically* is selected. Otherwise, your PC will not be able to resolve host names on the Internet (such as *www.pcmag.com*) to the corresponding IP addresses.

To set up TCP/IP in Windows 2000 Professional, click on the *Start* button to open *Windows 2000 Networking* in the Control Panel. Select *Settings*, and then select *Network and Dial-up Connections*. Double-click on the *Local Area Connec-*

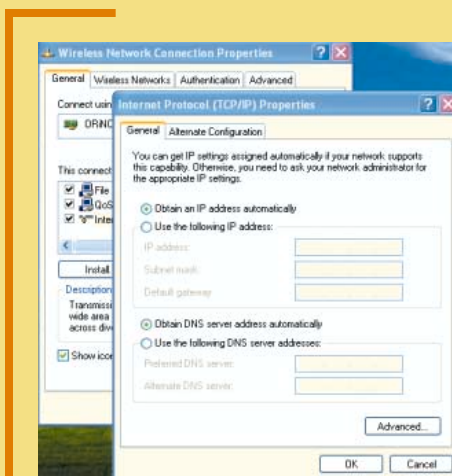
*tions* icon in the *Network and Dial-up Connections* window. Click on the *Properties* button. Select the *Internet Protocol (TCP/IP)* component and click on *Properties*. Then check the boxes titled *Obtain an IP address automatically* and *Obtain DNS server address automatically*. This will allow your PC to obtain a valid IP address from your broadband DHCP server.

For Mac OS X, you must go to the Apple Menu in the upper-left-hand corner of your screen and open *System Preferences*. When this window opens, click on the *Network* icon. Under the *Built-in Ethernet* adapter configuration, select the *TCP/IP* tab. In the *Configure* drop-down menu, select *Using DHCP*. Click on the *Apply Now* button and wait for the *IP address*, *Subnet Mask*, *Router*, and *DNS Server* fields to be populated automatically.

## FILE SHARING, PRINT SHARING, CLIENT CONFIGURATION

If you use Microsoft Windows, particularly Windows XP, it's a cinch to set up file sharing for your network.

With Windows XP, right-click on *My Network Places*, choose *Properties*, then right-click again on the active network connection, selecting *Properties* once more. Make sure that *File and Printer Sharing for Microsoft Networks* appears in the box that reads *This connection uses*



**THE IP ADDRESS** and DNS server configuration should be set to obtain a valid address automatically when a DHCP server is present on your network.





**THE SHARING TAB** on the *Converted Music Properties* page will let you define a share name and set access permissions.

the following items. If it doesn't, install it by clicking on the *Install* button, then select *Client*, then *Add*. Then select *Microsoft and Client for Microsoft Networks*. Once the software is installed, individual folder shares must be configured.

It's safest to share only the specific folders you want others to access. To do this, right-click on each of those folders in turn from within Windows Explorer on each PC you are networking and select *Sharing and Security*, and then enable folder sharing.

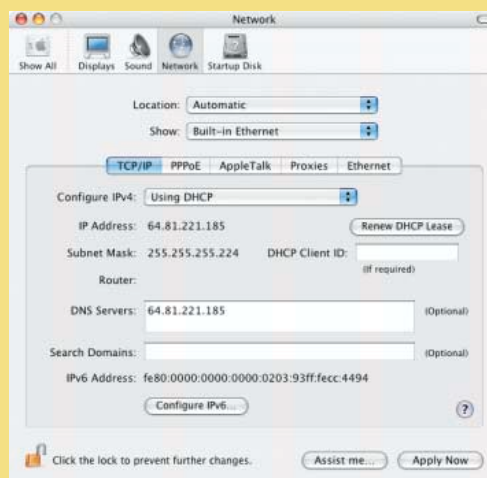
For client configuration in Microsoft Windows 2000 machines, the procedure is slightly different. First go to *Settings* in the Start menu, and then click on *Network And Dial-up Connections*. Once the window opens, right-click on *Local Area Connection*, then choose *Properties* from the bottom of the menu. Here you want to make sure that *Client for Microsoft Networks* appears in the box—just as described above for Windows XP. If it doesn't, follow the procedure above to install it.

The procedure for enabling file shar-

ing is similar, though after right-clicking on a given folder, select either *Sharing* or *Properties* from the dialog box; each of these provides you with the tabbed dialog boxes for *Sharing* or *General*. Within *Sharing*, you will see the default *Do not share this folder* selected. To turn on sharing, click on *Share this folder*; the name will be automatically inserted by Windows, and you will then be able to go into the *Permissions* dialog box to pare down file access to specific users or leave the default of *Everyone*.

To share a printer, we recommend that you purchase an inexpensive print server, rather than setting up print sharing in Windows. The advantage is that you don't have to leave your PC on at all times to maintain print-sharing services. (See "Home Office" on page 94.)

When you set up file sharing and access to PCs, you have the choice to create either a workgroup or a domain— if you are running a centralized multimedia server running Windows 2000 Server or Windows Server 2003. To learn how to create a workgroup or domain on your network, go to [www.pcmag.com/homenetworking](http://www.pcmag.com/homenetworking).



**THIS SCREEN** displays that a Mac has successfully acquired an IP address with a corresponding Subnet Mask. Make sure to select the correct interface in the *Show* drop-down list.

## NETWORKING PCs AND MACS

If you have a heterogeneous network with both Macs and PCs, for basic system configuration you should make your Macs part of the same workgroup or domain as your Windows systems. To do this, open *Directory Access* in *Applications | Utilities | Directory Access*. Make sure that the *SMB* box is checked and select *Configure*. Enter the name of your Windows workgroup or domain. Note that you will be prompted for your workgroup or domain password.

To share files that reside on a PC, just place them in a folder and then right-click on it, select *Properties*, pick the *Sharing* tab, and select *Share this folder*.

To share files that reside on a Mac, open *System Preferences* in *Applications | System | Preferences* and go to *Sharing* under *Internet & Network*, then select *Windows Sharing*. If the service doesn't start, click on *Start*. This will share your entire home directory.

To access files and directories on your Mac from your PC, click on *Start | Run* and enter your Mac's IP address and your short OS X user name (for example, *192.168.1.10/macuser*). Now authenticate

with your Mac credentials, and you can map this share so that it is accessible as a drive letter.

To access your PC from your Mac, click on your desktop, making Finder the active application. From the menu, select *Go | Connect to Server*. In the *Server Address* field enter *smb://*, followed by the IP address of your PC and the Windows share you wish to access (for example, *smb://192.168.1.10/PC*). Authenticate by entering the name of your PC in the *Workgroup/Domain* field (unless your PC is part of a domain, in which case, enter the domain name) and your user name and password.

Your shared folder should appear as a network drive on your desktop.—*Oliver Kaven*

# Upstairs Bedrooms

**W**hen the grown kids come for visits, or when friends are in town, the Browns want them to be able to go online anywhere in the house, including the bedrooms. It isn't essential to have the fastest connection in the extra bedrooms, since guests will most likely just be checking e-mail or browsing the Web. One other hospitality the Browns want to impart to their guests is the gift of music; they want any visitor to enjoy the music collection on their multimedia file server while drifting off to sleep.

## CONNECTIVITY

**Structured wiring** )))) Structured wiring isn't affordable for every room, but we recommend that the Browns install it in a few rooms upstairs, in addition to the living room and office downstairs.

**Wireless** )))) With an 802.11g wireless router in their first-floor office, the Browns can also have wireless connectivity in the bedrooms. 802.11g has a maximum usable indoor range of 150 feet. But if you're having trouble stretching your router's wireless signal to various parts of the house, there are several things you can do. (See "Outdoors" on page 108.)

## ALTERNATIVES

Two potential alternative technologies are power-line networking (HomePlug) and phone-line (HPNA). Both technologies use existing home wiring—phone cables and electrical wiring, respectively—to network devices.

You can use either of them as the only type of networking in your home, but we don't recommend doing this because of the relatively low throughput of both technologies. If you plan to network your entire house, the best use of power-line or phone-line networking is as an adjunct to your wired or wireless network. Consider using them in rooms where wireless signals don't reach or where it's either too expensive or nearly impossible to run cable, as in apartments where drilling into walls is prohibited.

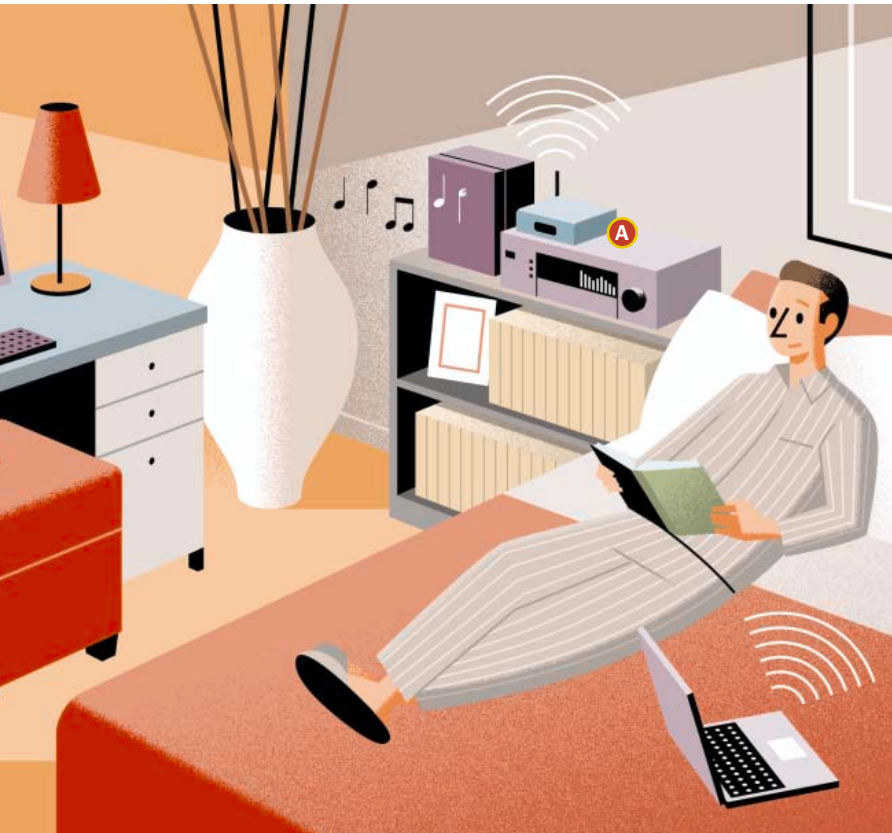
**MORE ON THE WEB:** For additional home networking hints and links to other home networking stories, visit [www.pcmag.com/homenetworking](http://www.pcmag.com/homenetworking).



**PHONE-LINE** • Much like power-line technology, phone-line networking requires a device that plugs into both your PC and a phone jack. High-speed connectivity is then transmitted through your phone lines. The number of power-line or phone-line home networks is tiny compared with wireless home networks. And power-line has a larger following than phone-line, in large part because there are far more power outlets than phone jacks in a typical home. Though the latest phone-line standard, HomePNA (HPNA) 3.0, has nominal throughput of up to 128 Mbps, there are no products on the market yet that use this specification. Most of the few phone-line products available today comply with HPNA 2.0, which on PC Magazine Labs' tests produced throughput rates of 4 to 6 Mbps.

## PRODUCTS

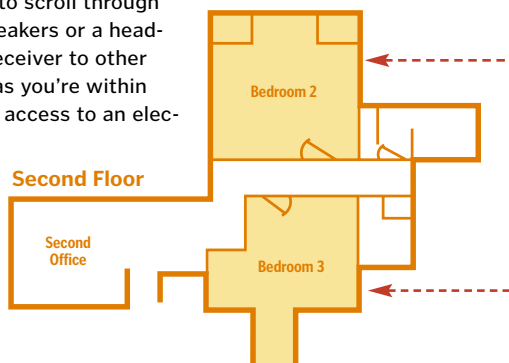
- ))) Linksys HPB200 HomeLink Phoneline 10M Ethernet Bridge, \$190 street; USB200HA HomeLink Phoneline 10M USB Network Adapter, \$70; HPRO200 HomeLink Phoneline 10MB Cable/DSL Router, \$150. Linksys Group, [www.linksys.com](http://www.linksys.com).
- ))) SMC EZ Connect Wireless HomePNA 2.0 USB Adapter 2821, \$60 street; EZ Card HomePNA 2.0 PC Card 2832, \$60. SMC Networks, [www.smc.com](http://www.smc.com).



**A MUSIC MEDIA RECEIVERS** • The Browns want houseguests to be able to listen to music, so we recommend a media receiver specifically for audio. Music receivers that have LCDs on the front panel or on the remote, such as the ones listed below, are ideal, because they don't need to be connected to a PC to scroll through playlists. And by connecting powered speakers or a headset to such a device, you can carry the receiver to other rooms, playing music anywhere as long as you're within range of your wireless network and have access to an electrical outlet.

#### PRODUCTS

- »» Creative Sound Blaster Wireless Music, \$250 street. Creative Labs Inc., [www.creative.com](http://www.creative.com). (Reviewed February 17, 2004. ●●●●●)
- »» Linksys Wireless-B Media Link for Music (802.11b), pricing to be determined. Linksys Group Inc., [www.linksys.com](http://www.linksys.com).
- »» Netgear MP101 Wireless Digital Music Player (802.11b), \$150 street. Netgear Inc., [www.netgear.com](http://www.netgear.com).



**B POWER-LINE** • The easy installation, potential for multiple connections in one room, and decent throughput speeds are the greatest advantages of power-line technology. You simply plug a small device directly into a wall socket and connect the device to your PC via either a USB or Ethernet cable. The device essentially transforms your power lines into network lines. The maximum theoretical throughput of power-line is 14 Mbps, though on our tests file-transfer throughput was 4.8 Mbps, just slightly better than the throughput results of 802.11b devices. Power-line products support 56-bit DES encryption, which we recommend turning on for home networks, even though the default setting has security turned off for easy installation. Also, as you might guess, high-power appliances can affect the throughput of power-line. So you might not want to send large files while someone is using a blow dryer in the next room. Several manufacturers offer combination power-line/wireless routers, so users can deploy both technologies from one device.

#### PRODUCTS

- »» Asoka PlugLink USB Wall Mount (PL9720-USB), \$125 list; PlugLink Ethernet Wall Mount (PL9620-ETH), \$125; PlugLink PL Wireless Access Point (PL9510-WAP), \$200. Asoka USA Corp., [www.asokausa.com](http://www.asokausa.com). (Reviewed April 22, 2003. ●●●●●)
- »» Belkin F5D4050 Powerline USB Adapter, \$80 list; F5D4070 Powerline Ethernet Adapter, \$80. Belkin Corp., [www.belkin.com](http://www.belkin.com).
- »» Linksys Instant PowerLine Etherfast 10/100 Bridge PLEBR10, \$90 street. (Reviewed April 22, 2003. ●●●●●) Instant PowerLine USB Adapter PlusB10, \$90. Linksys Group Inc., [www.linksys.com](http://www.linksys.com).
- »» Netgear Powerline Adapter XE102, \$65 street. Netgear Inc., [www.netgear.com](http://www.netgear.com). (Reviewed April 22, 2003. ●●●●●)

# Gear Up for Cool Connections

## Home Office

Wireless devices can simplify your office connections. A wireless router allows you to share Internet access and also connect wirelessly to the network. A wireless printer or print server lets you print from anywhere in the house within signal range.



Linksys WRT54G wireless router

Belkin F1UP0001 print server



HP PSC 2510 Photosmart



Sony VAIO Digital Studio PCV-RZ46G



Prismiq MediaPlayer

## Living Room

A PVR (personal video recorder) can record your favorite TV shows automatically, and a media receiver can stream audio, video, and photo files from your PCs to your TV or stereo. You can buy stand-alone devices or buy a Media Center PC, which can handle both of these tasks.



Gateway Media Center FMC-901X



Panasonic DMR-E100



SMC EZ-Stream SMCWMR-AG

## Bedrooms

Power-line and phone-line technologies are two alternatives to wired and wireless Ethernet networks, and they can come in handy in rooms that are far away from your broadband modem and router. Also, music media receivers are always nice additions to bedrooms.

Netgear MP101 music receiver



Linksys PlusB10 power-line adapter

Netgear XE102 power-line adapter



## Kitchen

Tablet PCs make ideal kitchen companions because of their small footprint and easy portability. And music receivers keep you cooking without missing a beat.

Creative Sound Blaster Wireless Music



HP Compaq TC1100



Toshiba Portégé M205-5809



## Outdoors

You can keep your property connected using wireless antennas and protected using IP cameras for security. Power-over-Ethernet (PoE) technology can offer such devices electrical power where AC outlets aren't available.

D-Link DWL-P100 PoE devices



Hawking H-AIGSDP antenna



D-Link DCS-900 camera



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## PERFORMANCE TESTS

# Wired Ethernet and 802.11g Outpace the Rest



We used two tests to compare the performance of six home networking technologies: Gigabit Ethernet, power-line, phone-line, Fast Ethernet, and 802.11g and 802.11b wireless Ethernet. The first test measured simple file-transfer throughput from one device to another, and the second test measured file-transfer throughput using an application that generates network traffic.

## TEST-BED

Instead of performing the tests at PC Magazine Labs, we used the home of a PC Labs employee. He lives in an 80-year-old suburban apartment building with electrical wiring and walls that are more typical of what home networkers might experience than our labs environment would be.

We conducted the wireless portions of our testing over a distance of about 30 feet, connecting two rooms separated by a 20-foot hallway. The power-line network adapters were plugged into AC power strips populated with other electrical devices, including PCs, TVs, and a stereo system. We tested Gigabit and Fast Ethernet using Category 5e cable.

## FILE-TRANSFER THROUGHPUT

The file-transfer test reflects the everyday transfer of files such as MP3 and video files from one PC to another. We used one 50MB file and timed the transfer with a stopwatch. All file-transfer tests were executed at the command line to avoid delays introduced by the graphical user interface.

The results were in line with our expectations. The 802.11b, power-line, and phone-line technologies achieved speeds that would be reasonably fast for most everyday

tasks, but they seriously lagged behind the other technologies we tested. Fast Ethernet and 802.11g delivered speeds well suited for streaming media (especially when more than one person is streaming or moving files). But for those who need to

move very large files on a regular basis, blazing-fast Gigabit Ethernet is the best choice.

## CHARIOT THROUGHPUT

To obtain additional and more scientific throughput results, we used NetIQ's Chariot ([www.netiq.com](http://www.netiq.com)), a software tool that evaluates the performance of networked applications and devices.

We set up three 2.4-GHz Pentium 4-based machines and loaded a Chariot performance endpoint on each PC. We also used a 2.4-GHz Pentium 4 notebook.

A third desktop PC ran the Chariot console, an application that executes the test and collects the performance data from the endpoints. We used Chariot's standard throughput and response-time scripts using TCP and UDP protocols.

The results were comparable to those of our file-transfer throughput test, with 802.11b at the bottom of the scale, followed closely by power-line and phone-line. 802.11g wireless achieved a respectable 17.9 Mbps. The wired Ethernet entries achieved the fastest throughput; Gigabit Ethernet was again blisteringly fast, this time at 582 Mbps.

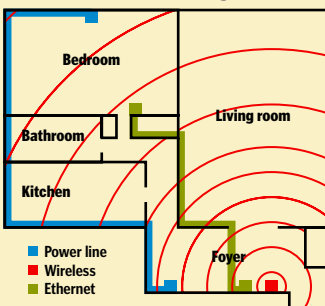
## CONCLUSION

All the technologies we reviewed in this story are adequate solutions for most home networking tasks. Keep in mind that your Internet connection is more likely to be a bottleneck than your network

infrastructure. DSL broadband access has a maximum throughput of 1.5 Mbps, and cable has a realistic top speed of about 4 Mbps. But if you intend to run multiple video streams or wish to move gigabytes of data across your home network on a regular basis, you should investigate 100Base-T wired Ethernet or even look into Gigabit

Ethernet. And in case you want to run the same applications over a wireless infrastructure, 802.11g is fast enough to suit most multimedia needs and is available for just a small premium over the cost of 802.11b. —Analysis written by Oliver Kaven

## Home Network Testing Area



**The 802.11b, power-line, and phone-line technologies achieved speeds that would be reasonably fast for most everyday tasks, but they seriously lagged behind the other technologies we tested.**

## HOME NETWORKING PRODUCTS

All scores are in megabits per second.  
High scores are best.  
Bold type denotes first place.

Technology	Maximum theoretical throughput	File-transfer throughput	Chariot throughput
<b>Buffalo LSW-GT-4W2</b>	Gigabit Ethernet	<b>1,000</b>	<b>582</b>
<b>D-Link DHP-100</b>	Power-line	14	4.5
<b>Linksys HPN100</b>	Phone-line	10	5.6
<b>Netgear FS605</b>	Fast Ethernet	100	56.1
<b>Netgear WGE101</b>	802.11g	54	17.9
<b>ZyXEL ZyAIR B-2000</b>	802.11b	11	4.4

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via the web

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from behind  
my cubicle walls

I shop online  
after closing  
my office door

# Kitchen



**A MUSIC MEDIA RECEIVER** • Music adds to the kitchen ambience, but the Browns don't see a need for streaming video or photos into this room. So as with the upstairs bedrooms, we recommend a wireless media receiver for music only in this room. Such a receiver can retrieve files from the multimedia server or other PCs on the network wirelessly and then connect to either a kitchen stereo or just a set of plain powered speakers. (For sample music media receivers, see page 101.)

**B TABLET COMPUTER** • The relatively small footprint of a tablet makes it a good choice for kitchen use. Reading news articles or e-mail at the kitchen table is easier with a tablet than with a regular notebook. A slate tablet can lie flat, as can a tablet with a screen-swivel design.

There are several ways to restrict users from gaining access to the Browns' personal files, but the least complicated way is to deploy solid domain security using Active Directory. Since their multimedia server would always be running to serve up content and files, we recommend configuring that to be their domain controller. As in an office environment, all users will have to log on with user names and passwords to gain access to files or the Internet. The Browns certainly don't run a mission-critical operation, but this setup will let them run a guest account in the kitchen, which will provide Internet access only.

In addition, the multimedia server can also be configured as a Web proxy and run content-filtering software, so you can control the browsing activities of your children without having to install local software on their PCs.

## PRODUCTS

»»» HP Compaq TC1100, with 1.0-GHz Pentium M, 512MB DDR SDRAM, 40GB hard drive, 10.4-inch XGA screen, wired and 802.11g Ethernet, Bluetooth, \$2,399 direct. Hewlett-Packard Co., [www.hp.com](http://www.hp.com). (Editors' Choice, reviewed December 9, 2003. ●●●●●)

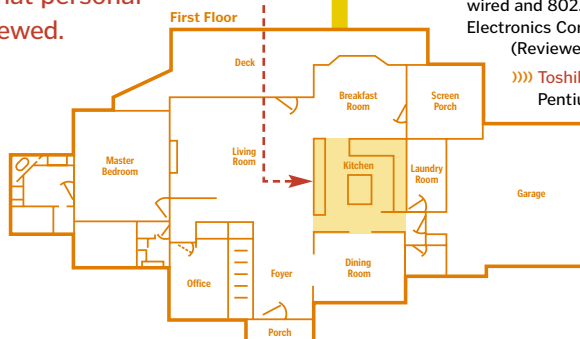
»»» Sharp Actius TN10W, with 1.1-GHz Pentium M, 256MB DDR SDRAM, 30GB hard drive, 12.1-inch XGA screen, wired and 802.11b Ethernet, \$1,999 direct. Sharp Electronics Corp., [www.sharpsystems.com](http://www.sharpsystems.com). (Reviewed December 9, 2003. ●●●●●)

»»» Toshiba Portégé M205-S809, 1.5-GHz Pentium M, 512MB DDR SDRAM, 40GB hard drive, USB DVD/CD-RW combo drive, 12.1-inch SXGA+ screen, wired and 802.11b Ethernet, \$2,400 street. Toshiba America Inc., [www.toshiba.com](http://www.toshiba.com). (Editors' Choice, reviewed February 3, 2004. ●●●●●)

The kitchen isn't considered an electronic communications hub, but for the Browns it is certainly a social communications hub: Everyone likes to gather here to chat and eat together. The Browns want to make sure people can check the weather and sports scores or look up recipes on the Internet, as well as listen to music from the Browns' digital collection. But they want to keep hardware and cabling clutter to a minimum in this room. They also want to keep the connectivity in the kitchen restricted to just Internet access, so that personal files on their local network can't be viewed.

## CONNECTIVITY

**Wireless** »»» Wireless is our method of choice here. Since the kitchen is an active work area where devices can get wet or damaged, we recommend keeping cabling to a minimum. The kitchen is close enough to the living room and office to receive sufficient wireless signal.





# AUTOMATIC VS. MANUAL DEFRAGMENTATION

	Diskeeper® 8.0	Built-in defragmenter
Completely automatic – requires no user or IT staff intervention	<b>Yes</b>	<b>No</b>
Automatically schedules defragmentation as needed	<b>Yes</b>	<b>No</b>
Runs in the background; allows users to work during defragmentation	<b>Yes</b>	<b>No</b>
Addresses critical reliability issues	<b>Yes</b>	<b>No</b>
Server-specific edition designed for large servers	<b>Yes</b>	<b>No</b>

## Automatic defragmentation is essential!

Disk fragmentation is a cancer that eats away at speed and reliability—and the defragmenter built into Windows is simply too slow, too obtrusive, and too labor-intensive to solve the problem. In fact, most IT departments that rely on the built-in defragmenter wind up never defragmenting at all.

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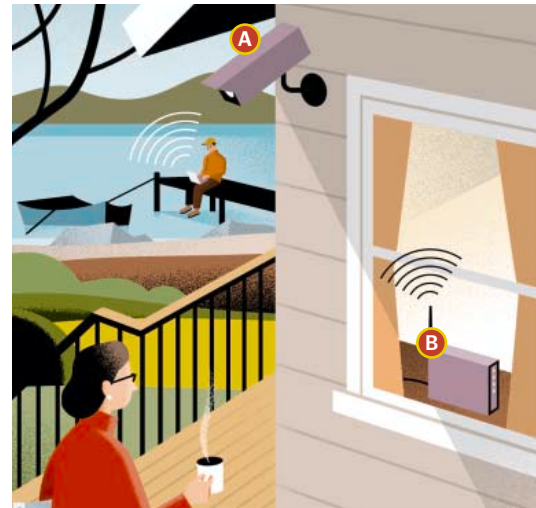
# Outdoors

To work or to bask in the North Carolina sun? The Browns hope they can do both at the same time. They plan to spend a good deal of time on the deck and on the boat dock behind the house, and they want to be able to check e-mail, browse the Internet, play digital music, and retrieve files from their network while they're outside. They also want to make sure their property is well protected and want more than a conventional system that protects the doors and windows of their home.

Because the house is expansive and has several entrances, they want to add external video cameras, so if someone approaches the house, they can see who it is just by looking on a computer display anywhere in the house.

## CONNECTIVITY

**Wireless** »»» The simplest, least-expensive way to extend the network beyond the deck is to use wireless. (See product descriptions in this section for wireless connectivity.)



**POWER-OVER-ETHERNET DEVICES** • Making sure AC power and a network connection are available outside can be a challenge. We recommend the Browns use a Power-over-Ethernet (PoE) solution, which delivers electrical power via Ethernet cable. If you have AC power but not an Ethernet connection near the camera locations, you should buy cameras with wireless capability.

### PRODUCTS

»»» D-Link DWL-P100, \$39 direct. D-Link Systems Inc., [www.dlink.com](http://www.dlink.com). (Reviewed September 17, 2002. ●●●●●)

**DIRECTIONAL ANTENNAS** • If neither a wireless access point nor a range extender provides a strong enough signal to reach the target location—in the Browns' case, the boat dock—an external antenna could be added to either one. There are two types of antenna: *directional*, which sends signals directly to a specific location, and *omnidirectional*, which sends out signals in a circular pattern. In this case, a directional antenna makes the most sense.

### PRODUCTS

- »»» D-Link ANT24-1400, \$139 direct. D-Link Systems Inc., [www.dlink.com](http://www.dlink.com).
- »»» Hawking H-AI6SDP, \$50 street. Hawking Technology Inc., [www.hawkingtech.com](http://www.hawkingtech.com).
- »»» Netgear ANT2405, \$55 street. Netgear Inc., [www.netgear.com](http://www.netgear.com).

**A SECURITY CAMERAS** • The Browns want IP-based cameras, so they can monitor their property on their PCs or remotely via the Internet. They'll need to buy enclosures to protect the cameras from bad weather.

### PRODUCTS

- »»» D-Link DCS-900, \$129 direct. D-Link Systems Inc., [www.dlink.com](http://www.dlink.com).
- »»» Linksys WVC11B, \$230 street. Linksys Group Inc., [www.linksys.com](http://www.linksys.com).

**B WIRELESS ACCESS POINT OR RANGE EXTENDER** • The wireless router in the Browns' first-floor office is located in the front of the house, and it works just fine for notebooks and PDAs inside the house, even on the back deck and the screened-in porch. But its signal won't reach as far as the boat dock. We recommend installing a wireless access point in the window of an upstairs room in the back of the house that has a view of the dock.

Because the Browns have structured wiring—and therefore an Ethernet jack upstairs—installing an access point here will not be a problem, since access points require wired Ethernet connectivity. If wired Ethernet is not available in an area where you want to extend your network, you can use a wireless range extender, which needs only to be plugged into a power outlet. ☰

### PRODUCTS

#### Wireless standalone access points

- »»» Belkin F5D7230-4, \$130 list. Belkin Corp., [www.belkin.com](http://www.belkin.com). (Reviewed Fall 2003. ●●●●●)
- »»» Linksys WAP54G, \$100 street. Linksys Group Inc., [www.linksys.com](http://www.linksys.com).

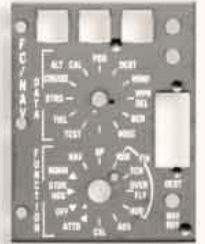
#### Wireless access points with range extenders

- »»» D-Link DWLG800AP, \$99 direct. D-Link Systems Inc., [www.dlink.com](http://www.dlink.com).
- »»» Netgear ProSafe WG302, \$240 street. Netgear Inc., [www.netgear.com](http://www.netgear.com).

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# BETTER CORPORATE



PHOTOGRAPHY BY  
THOM O'CONNOR

The ideal managed PC solution for business couples intuitive and powerful software management tools with reliable PCs.

Here's a look at the top five solutions.

# PCs

BY JIM AKIN

ALL REVIEWS BY CADE METZ

Deciding on a corporate managed PC line is one of the most important decisions an IT administrator can make. Sure, PCs themselves are easy to pick: Using comparable components, today's corporate PCs all but perform the same. The tricky part is evaluating the accompanying management packages, which ultimately hold the tools—some free, some for a fee—to manage the hundreds or thousands of client PCs, notebooks, and servers residing under one's IT administrative reign.

In the past, these management packages were frustrating to learn and therefore widely shunned. But the current generation have changed all that. When used on local area networks, today's software management suites let you inventory hardware, update firmware and drivers, and check for common system failures—without ever physically visiting a machine. Now why wouldn't you want that?

## THE MARKET LEADERS

The five main players in the corporate managed PC space are Dell, Gateway, HP, IBM, and MPC (formerly MicronPC). All offer PC desktop and notebook systems configured for business and a range of management tools for remote system monitoring and administration.

These offerings vary from manufacturer to manufacturer and in part reflect each company's target niche. IBM skews toward large enterprises with its ThinkVantage Technologies, which has myriad intuitive and useful management tools. Dell also targets the enterprise with its improved OpenManage line. Gateway, which relies on Intel's LANDesk management software, is best suited for small to midsize offices.

HP, using a mixture of its own apps and tools from Altiris, and MPC, with LANDesk Management Suite 8, both offer a bit more than Gateway. But their management tools aren't as broad or as rich as IBM's or Dell's.

(Note that LANDesk was once a division of Intel, and Gateway is still using the software that Intel developed. MPC, however, is using the newer LANDesk System Manager 8, developed by LANDesk Software, a spinoff from Intel.)

The *image stability* of each corporate PC line varies from manufacturer to manufacturer. An image encompasses the underlying hardware, such as the NIC or motherboard, as well as the operating system and related drivers, all of which

affect setups and rollouts. IBM guarantees that an image won't change for two years, whereas the guarantees of other manufacturers range from 12 to 15 months.

Image stability is important to companies when, for example, they buy new PCs with faster processors. IT departments want to make sure that the same image created for the 2.6-GHz P4 machines they bought eight months ago will work for the 3.0-GHz P4 PCs they bought yesterday.

## MANAGEMENT SOFTWARE: THE DIFFERENCES

From afar, the management packages may look similar. Each manufacturer enables the remote monitoring and inventory of client PCs reporting information such as hardware configuration, ROM and firmware versions, and version data for the OS as well as for all the other installed software. But the differences are in the details: the amount of information culled from client PCs and the way it's presented. For example, when a memory slot has failed on a system, some solutions will tell you that and only that; Gateway's solution, however, will tell you exactly which memory slot on the system has failed.

Although the client utilities themselves differ among the manufacturers, each client feeds information about itself upon request to the IT administrator—to verify that all PCs meet minimum system requirements before an officewide software upgrade, for example. Clients can also notify IT administrators when designated system parameters change, and IT managers can specify custom responses to such notifications. For example, failure of the CEO's hard drive might trigger a 911 dial to every IT pager; detection of MP3 files might trigger auto-deletion and a warning e-mail to the user; corruption of a Windows component might prompt a silent "self-healing" reinstallation.

Like the remote-management tools, client utilities can in some cases be upgraded with additional capabilities. These include authenticating users, sensing and alerting IT when a case is opened or hardware components are tampered with, automatically updating antivirus software and virus profiles, and backing up and archiving user files locally and to a server.

## WHAT TO LOOK FOR

Although these options may not answer all your needs, they can still go a long way toward keeping your systems monitored and healthy—and

## REVIEWED IN THIS STORY

- 114 Dell ●●●●●
- 115 Gateway ●●●●●
- 117 HP ●●●●●
- 118 IBM ●●●●●
- 120 MPC ●●●●●
- 115 Editors' Choice
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keeping your staff productive. Here are a few things to keep in mind as you shop for your corporate managed PC solution.

**Mixed environments.** Few managers will have the luxury of a blank slate when setting up a remote-administration scheme, so existing systems need to be considered along with new purchases. Manufacturers' entry-level management systems work best with their own hardware. Plan to upgrade or enlist a third-party management solution from Altiris or Tivoli for more versatility of operation when working with other vendors' boxes.

**Roaming empire.** These days, with more people going wireless, networks consist of much more than just PCs. Managing laptops and even some handheld devices poses obvious challenges, and it's wise to develop a strategy for supporting them *before* choosing a management tool. Depending on the size and needs of your mobile workforce, you should plan appropriate policies for managing portable devices and make sure your management application supports them.

Implement procedures for notifying users and scheduling installations, and establish protocols for troubleshooting portables and handhelds. Be sure to consider whether these operations can or will be performed by docking devices to a wired

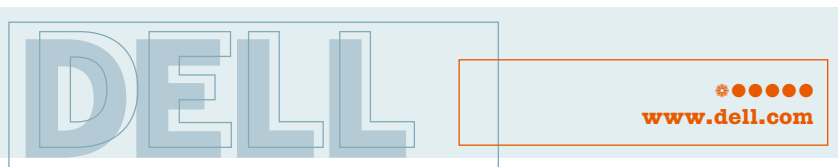
network, using dial-up or wireless VPN connections.

**Give props to preparation.** Network software distribution and deployment can save IT teams many hours—and many headaches. But if not done properly, they can cause company-wide glitches that redefine *migraine*.

To avoid this, set up at least one of each hardware model in your office to pretest installations, then install and test a few systems before deploying to the whole organization. When preconfiguring systems on-site for use at other locations, avoid "false positive" preflight checks by making sure your test environment replicates the target site's network settings, server paths, and user/workgroup permissions.

**Training.** All of the manufacturers provide seminars on implementing and using their system management tools. Consider attending these courses before purchasing anything to make sure a product meets your organization's needs. (Depending on the size of your prospective purchase, you may be able to get this comped by your sales rep.) And once you've settled on an option, have your staff trained before implementation.

Following are corporate managed PC solutions from the five leaders in this space.

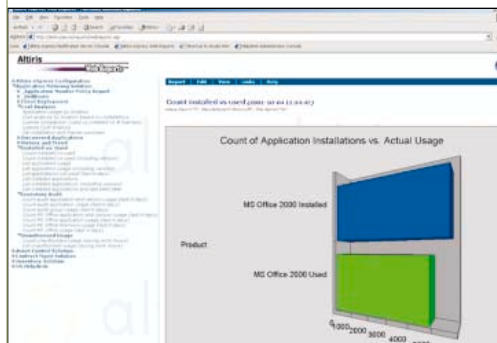


don't look back, IBM: Somebody might be gaining on you. Dell continues to improve its corporate line of OptiPlex PCs, and Dell offers a more impressive array of management tools than ever before. Most notably, the company

The Dell OptiPlex platform is divided into three separate lines: the GX60, the SX270, and the GX270. The GX60, built around Intel's Celeron processor, is Dell's budget series. The SX270 is the company's family of ultrasmall desktops. And the GX270 delivers the mainstream models, available in three different guises: mini-tower, desktop, and small-form-factor, which is the system we tested.

You can use the same software image across all GX270 systems, but you have to apply a different image to GX60 or SX270 machines, because they use a different motherboard. Dell promises to keep each line available for at least 15 months, but it does not guarantee that the systems will support the same image over that period. But Dell's ImageWatch program gives all customers 60 to 90 days' notice before the company makes any image-changing hardware adjustments. (IBM is the only company reviewed here that guarantees image compatibility for a full two years.)

As part of its OpenManage Suite, Dell provides two free management tools for system inventory and health monitoring.



**Altiris Web Reports, part of the Dell Asset Management suite, lets you compare the number of MS Office 2000 installations against the actual usage.**

recently introduced an automatic backup system along the same lines as IBM's RapidRestore Ultra. Nevertheless, Dell is still a half step behind its biggest competitor, failing—if only by a slight margin—to ensure that its software image stays unchanged as long as the IBM ThinkCentre's.

The OpenManage Client Connector lets you remotely manage only one system at a time, while the OpenManage IT Assistant lets you gather information on multiple systems at once. The clients lack the slick interface available with LANDesk's management software (found on Gateway and MPC systems), and their inventory lists don't go into quite as much detail; you can't see exactly which memory slots are filled, for instance. But they're still effective and relatively easy to use.

With Dell's Local Recovery software, you instantly recover lost files or return to past software images. Much like IBM's RapidRestore Ultra, Local Recovery regularly backs up your software image to a local hard drive partition. A free version is available from the Dell Web site, but this can be used only locally. If you wish to restore systems remotely, you have to pay \$29 extra per client for Local Recovery Pro. Neither application can back up open or locked files or create a recovery CD, but you can handle such tasks with the company's Recovery Solution application, available for \$47 per client.

Dell also offers the OpenManage Client Administrator, which lets you deploy images and applications and even lets you inventory both hardware and software. Based on technology from software developer Altiris, this package is available for a per-client license fee: \$47 for up to 1,000 seats. And last, Dell provides a free tool, the Dell Client Configuration utility, for remotely updating BIOSs and other system



settings. This utility can't be used without a software distribution tool such as OpenManage Client Administrator.

The small-form-factor GX270 we tested at PC Magazine Labs is everything you'd expect it to be. Its performance on Business Winstone was very good, as was the performance of the other systems we reviewed. Its clamshell chassis opens with ease. You can remove any of its drives without tools (though because of the placement of interior system cables, the hard drive is a bit more difficult to remove

than we would have liked). You can also add or remove PCI cards tool-free. As an added bonus, the system's keyboard includes a built-in smart-card reader. The machine, however, lacks a floppy disk drive; adding one costs an extra \$20.

Dell backs the system with a three-year parts-and-labor warranty. For \$99 extra, you can purchase Dell's Gold Tech Support for access to priority support.

Dell's OptiPlex line isn't quite as impressive as IBM's ThinkCentre family, but it's a viable option that comes close.



though it may not suit larger operations, Gateway's mainstream corporate line, the E-4100, is certainly a good fit for small to medium-size businesses. The bundled LANDesk Client Manager 6.3 makes it easy to inventory and monitor E-4100 systems and update small files.

Though LANDesk ClientManager 6.3 doesn't deploy entire images or applications remotely, as the other management packages reviewed here do (albeit for a fee), the E-4100 models use the same software image and can easily be repaired and upgraded.

The E-4100 is one of Gateway's three

corporate lines. But like MPC, Gateway has only two PC models in each line; the other companies each give you three or four options. Whereas the E-2100 line consists of low-cost systems and the E-6100 line features machines with all the latest and greatest hardware, the E-4100 is the company's mainstream line, delivering midlevel hardware at midlevel prices. We reviewed the small-form-factor E-4100-C system, though there's also a mini-tower.

Although you can't use the same software image across the three lines, you'll have no problem using the same image within each line. And the three families

## IBM



First setting the bar, now raising it, IBM—our Editors' Choice—offers myriad management tools in its

ThinkVantage Technologies software suite, from its renowned RapidRestore Ultra to a slew of remote operating capabilities. IBM also guarantees a stable software image for a full two years; the other companies guarantee from 12 to 15 months. And with the introduction of IBM's new collection of ultrasmall desktops, you can now use an image across four different form factors.

Dell's OpenManage solution competes strongly with IBM, offering Dell Local Recovery and an impressive amount of remote management capability. But Dell remains just a half step behind IBM, partly because of its slightly shorter image guarantee.

share the same driver set, so you can use the same drivers across all three lines. Despite the difference in size, the small-form-factor and mini-tower versions of the E-4100 have the same Intel motherboard.

Gateway guarantees that each system will be available for at least 12 months, but in reality, a mainstream system like the small-form-factor E-4100-C remains on the

## The Other Corporate Managed PC?

Could improvements in management software spur a renaissance for blade PCs? Some signs point to yes. Blade servers have always had properties that make them attractive to IT managers: slim size, easy management, and low total cost of ownership. Now the same form factor is making its way into the land of corporate PCs, where management software is key.

"The blade form factor is extremely efficient in power, space, and manageability for clients as well as for servers, provided that IT and the user base accept a 'PC' located in a data center rather than at their desks," says Gordon Haff, senior analyst specializing in blades at market research firm Illuminata.

A blade PC is essentially a thin client that harnesses processing, storage, networking, software, and other resources from systems in another location. ClearCube and Hewlett-Packard are the two companies leading the pack, though each is taking a different approach, according to Haff.

"While ClearCube is actively creating products with an emphasis on high function," Haff says, "HP is seeing how far it can take repackaging and readapting technologies created

by other vendors for other purposes."

ClearCube's blade PCs are very compact but offer a lot of locally stored muscle. Components like Pentium 4 and Xeon processors, memory, hard drives, and video cards are included, allowing the blades to provide full PC functions.

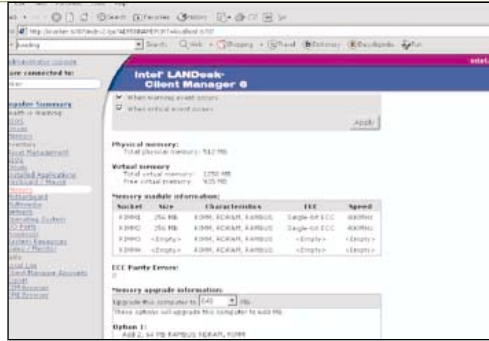
HP's solution, called Consolidated Client Infrastructure, combines new kinds of thin clients and management software with existing networking infrastructure elements. HP supplies the blade PCs and has partnered with many companies that specialize in traditional forms of client/server networking to handle the other parts of the infrastructure.

Part of the buzz surrounding blade PCs comes from new advances in management software. Haff notes that many kinds of software optimized for IT managers are now perfect for use in offices with blades. "HP's Rapid Deployment Pack software," Haff says by way of example, "lets an IT manager easily capture an entire system state, so that state can be quickly and easily replicated." Portability of system state and reduced costs may point to good things ahead for blade PCs.—*Sebastian Rupley*

market for much longer. At the end of their 12-month life cycle, Gateway's mainstream lines are typically converted into low-cost lines, often assuming new names.

Each corporate PC ships with its own copy of LANDesk Client Manager 6.3, which lets you inventory and monitor the system locally. If you wish to manage systems remotely, you can pay \$49 extra for a copy of Client Manager Administrator, which can query machines from anywhere on your network.

Client Manager isn't as powerful as Dell's and IBM's management suites, but what it does it does well—and it may be all you need. For example, whereas some competing tools are often very difficult to learn, Client Manager's Web-based interface is exceptionally intuitive. Even novice computer users would have little trouble parsing through an inventory of system



**View inventory data remotely to ensure, for example, that there is enough memory on a client system to support a specific application.**

hardware or configuring system alerts.

Inventory information is extremely detailed. Client Manager can tell you exactly which memory slots are filled and which aren't. It can even tell you which IRQs (in-

terrupt requests) are taken and which aren't. And there is a wide range of ways to monitor a system: You can check for high temperatures and voltages, even receive alerts when the system has filled a certain amount of disk space or memory.

With Client Manager Administrator, you can wake up, restart, and shut down machines from across the network. You can load small files, such as drivers or BIOSs, remotely. But you can't load images, install applications, or back up system data. For such

tasks, you have to purchase a third-party tool, such as Altiris or Microsoft SMS.

The small-form-factor E-4100-C isn't as cleverly designed as the small-form-factor systems from HP and IBM, which,

# Management Solutions At a Glance

In rating **security**, we focus on security features above and beyond those built into Windows XP or the server, such as smart-card readers, on-board security chips, easy-to-use lockdown devices, and reporting (management) software.

For **manageability**, we evaluate the tools that help IT technicians avert problems or fix minor glitches from their desks. These include remote monitoring, remote control, inventory, and integration between management software and image control software. We regard customized local and network backup scheduling a plus.

The **serviceability** rating indicates how well the tools and features help a technician fix major problems and component failures. Key factors are a tool-free chassis, hot-swappable modular components, priority technical support, and customized-support Web sites.

The **image management** rating reflects the ease of use and features of the image management utilities, such as customization by location or department, updates to the image, security and Microsoft update management, application patch management, and driver updates, as well as the system vendor's ability to pre-load images for large rollouts. We give points for the level of detail under image deployment and for reporting during image rollout, especially in the context of failed or interrupted procedures.

For **configurability** we look at the number of form factors available and the ability to drop the same image onto desktops of various sizes and even notebooks, as well as whether or not common parts like hard drives and optical drives are modular and swappable among form factors. We also consider whether the IT support page included in the service contract targets driver and support pages for the PC workstation and server models.

For the **overall** rating we take all of these into account, as well as certain intangibles such as value for the dollar.

	SECURITY	MANAGEABILITY
<b>Dell</b>	★★★★ Smart-card reader built into the keyboard.	★★★★★ Dell OpenManage Suite contains a remarkable array of management tools, including utilities for inventory, monitoring, and image backup.
<b>Gateway</b>	★★★ Optional fingerprint reader.	★★★ Intel LANDesk Client Manager 6.3 is an older package, yet still very capable and easy to use. A remote console is available for \$49.
<b>HP</b>	★★★ Optional security chip.	★★★ HP Client Manager has very basic tools, yet it turns into a full management suite from its seamless integration with Altiris management software.
<b>IBM</b>	★★★★ Built-in security chip.	★★★★★ ThinkVantage Technologies is extremely comprehensive; it has the most management tools available free and for purchase.
<b>MPC</b>	★★★ Optional smart-card reader.	★★★★ LANDesk System Manager 8 is preloaded. LANDesk Management Suite 8 (\$89) is easy to use; it lets you update, monitor, and inventory.

RED denotes Editors' Choice.

—EXCELLENT

—VERY GOOD

—GOOD

for instance, even let you remove their motherboards without tools, but it comes close. You can set it on end like a tower or lay it flat like a desktop. You can open its chassis by removing a thumbscrew and just as easily remove its three drives (floppy disk, optical, and hard drive). There's even a little room for expansion: a 3.5-inch drive bay, a half-height AGP slot, and a half-height PCI slot.

Like its sister, the E-4100 mini-tower, the system ships with a three-year parts-and-labor warranty, including on-site service. For an additional fee, you can also arrange for your own Gateway support number, ensuring that you can always reach a technician without delay.

There isn't much wrong with the Gateway E-4100 line and management solution. It just lacks some of the perks available from Dell or IBM.

though not quite as impressive as the managed PC platforms sold by Dell and IBM, HP's mainstream solution is more than capable of satisfying the average IT department.

The HP Compaq d530 business line offers three form factors, each with a 15-month life cycle. HP anticipates that clients will undergo only one or two image-changing updates over the d530's 15-month life cycle. The line lacks inherent software for remotely deploying images and applications, but its inventory and monitoring tools integrate seamlessly with the powerful deployment soft-

ware available from third-party software developer Altiris, to which the HP solution is closely tied.

The d530 is HP's leading corporate PC family. The company's other corporate lines, the d200 and d300, are designed for businesses with tight budgets. They offer machines equipped with low-cost Intel Celeron and AMD Athlon XP processors and lack any sort of management software. And they don't boast the long, stable life cycle of the d530.

As with many of the other companies, HP's software images can't be used across the various lines because of different motherboards. But HP provides plenty of variety within the single-image d530 family. It includes an average-size mini-tower that easily converts to a desktop, plus a small-form-factor model (reviewed here) and an ultraslim model.

HP, like Dell, reserves the right to make image-altering hardware changes to these machines, but it tries to keep such changes to a minimum. Only one or two changes were made to each of its past two managed-PC lines in the 15 months they were available. Large companies can request personalized intranet sites, at which they'll be alerted to such changes.

All customers receive a free copy of HP Client Manager. A Web-based tool with reputable Altiris technology at its core, Client Manager lets you inventory hardware, monitor system health, run diagnostics, updates BIOSs, and load drivers. This tool is not as easy to learn and use as LANDesk's and not quite as comprehensive as IBM's. And you can't use it to inventory and monitor systems with the

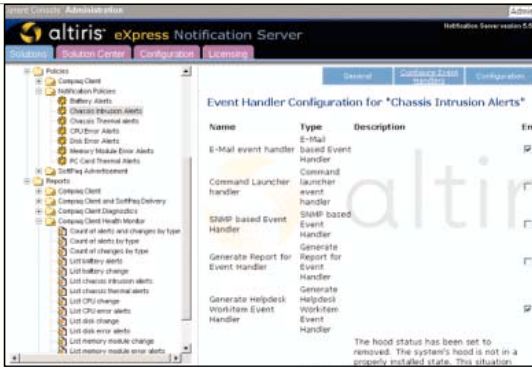
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Our contributors: **Jim Akin** is a freelance writer. **Cade Metz** is a senior writer and **Sebastian Rupley** is a senior editor at *PC Magazine*. Associate editor **Jenn DeFeo** and PC Magazine Labs lead analyst **Joel Santo Domingo** were in charge of this story.

SERVICEABILITY	IMAGE MANAGEMENT	CONFIGURABILITY	OVERALL
●●●● Tool-free chassis, drives, card slots.	●●●● Line available for 15 months. Image may change.	●●● Three form factors support the same image. The ultraslim form factor uses a different image.	●●●● <b>Impressive in almost every respect, yet it remains a half step behind IBM in image management and configurability.</b>
●●●● Tool-free chassis, drives, card slots.	●●● Line available for 12 months, possibly another 12 under a different name.	●● Two different form factors support the same image. An ultraslim model is not available.	●●● <b>Good choice for small and medium-size businesses. Could offer more management software and image-compatible form factors.</b>
●●●●● Everything tool-free. Even the motherboard is removable without tools.	●●●● Line available for 15 months. Image may change.	●●●● Three form factors, including the ultraslim model, support the same image.	●●●● <b>The small-form-factor chassis is beautifully designed. You'll have to go to partner Altiris for a complete set of management apps, but that's a small complaint.</b>
●●●●● Everything tool-free. Even the motherboard is removable without tools.	●●●●● Image will not change for 2 years.	●●●●● Four different form factors support the same image.	●●●●● <b>The best just got better with the new ultraslim form factor. ThinkVantage may contain even more management tools than you need.</b>
●●●● Tool-free chassis, drives, card slots.	●●● Line available for 12 months. Image may change.	●● Two different form factors support the same image. An ultraslim model is not available.	●●● <b>LANDesk Management Suite 8 scores points for ease of use. The line could use more form factors and a better image stability guarantee.</b>

-FAIR -POOR



**HP's software dovetails with Altiris's to offer even more solutions, such as remote system monitoring.**

ware licenses, manage security patches, and perform remote troubleshooting. These tools are on the same level with those bundled with the Dell and IBM lines. (Dell bases some of its software on Altiris's products.) The only

and replace drives and even the motherboard without tools.

Like the small-form-factor Dell OptiPlex GX270, this machine does not include a floppy disk drive, which is a \$30 option. And for about \$25, HP offers an optional hardware chipset for encrypting files and e-mail. (With the IBM ThinkCentre S50, such a chip is included for free.) All d530 systems carry a three-year parts-and-labor warranty complete with on-site service. Same-day or next-day service is available for an extra fee.

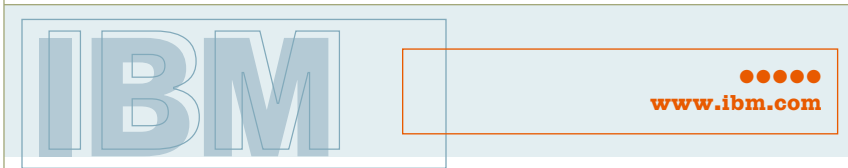
Though HP's management software offering is overshadowed by the ones from Dell and IBM, we're impressed with its seamless integration with Altiris tools, as well as with HP's wide range of image-compatible systems, like the small-form-factor d530. HP's corporate lines should please all but the most demanding IT professionals.

same level of detail as LANDesk's, identifying which memory slots are free or tracking something as specific as motherboard voltages.

This tool, however, is designed for a broader kind of network management. It's meant to dovetail with the much more powerful Altiris software, which can deploy images, load applications, track soft-

major drawback is that if you wish to purchase the additional software, you have to buy it through Altiris.

The small-form-factor d530, tested at PC Magazine Labs, is as impressive as any other client in our roundup. It's easy to upgrade and repair. You can open its chassis simply by lifting a lever in the rear of the system, and you can add PCI cards



don't let the new name confuse you. IBM's ThinkCentre corporate line, formerly NetVista, is still a cut above the rest and winner of *PC Magazine's* Editors' Choice. The company's wonderfully comprehensive management tools are just the beginning of what separates IBM from the rest. IBM guarantees that its systems will support the same software image for a full two years. And with the introduction of its new collection of ultrasmall desktops, the ThinkCentre S Series, you can now use an image across four different form factors.

The ThinkCentre corporate line consists of three separate subfamilies: the A Series, the M Series, and the S Series. The A Series has budget machines, with prices starting at \$399 (without monitor), but uses an entirely different image than the others. The M Series, a more expensive but more powerful collection of machines, offers three different form factors: a tower, a desktop, and a small desktop. And all three of these can share an image with the S Series systems, which are 40 percent smaller than even the M Series' smallest desktop.

IBM guarantees that each system's

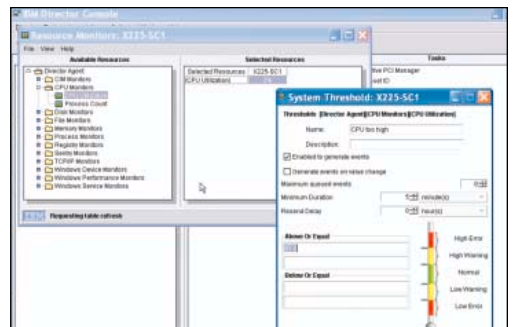
hardware will remain unchanged for at least a year. No other vendor even comes close to making such a claim. IBM will also preload images customized to your specifications before your machines leave the factory, but unlike in past years, you'll have to pay for this service. (Pricing had not been set as of our publication date; IBM is currently working it out on a case-by-case basis.)

The company's management tools are grouped under the umbrella ThinkVantage Technologies. This suite includes several different applications: Some are free; others must be purchased separately.

Similar to Dell's LocalRecovery app, IBM's RapidRestore Ultra, one of the free apps, lets you easily retrieve past software images should anything go wrong with a system. The app lets you store up to three different system snapshots (the initial load, for instance, and two more recent images), saving them to a CD, an external hard drive, or a data partition on the system's main hard drive. When the time comes, you can re-

trieve individual files or restore an entire image. And since RapidRestore also resides on the isolated data partition, you can get to it even if your OS won't load.

The Software Delivery Assistant, another free tool, lets you create images for your most popular client applications, such as Microsoft Word, Excel, or Adobe Acrobat, so you can easily deploy them across your network. You can burn the images to CD and distribute them by



**IBM Director software can help you monitor a variety of resources on desktops, notebooks, and servers.**

hand; or, with the help of a software distribution tool such as Microsoft SMS or IBM's Remote Deployment Manager, you can load them remotely. The System Migration Assistant, the last free package, lets you easily transfer data files, OS settings, and network settings from old machines to new ones.

IBM Director, which comes bundled

# Client Desktops Tested



To assess the different management packages, we set up our own heterogeneous network on a closed LAN, complete with five client PCs from Dell, Gateway, HP, IBM, and

MPC, as well as several notebooks, printers, servers, and other desktops from the various providers.

Although we concentrate our main reviews on the different management software offerings, we also tested the performance of each of the five client PCs. We acquired a small-form-factor PC from each manufacturer, at prices ranging from \$1,114 to \$1,199 (direct), and tested each machine running common business applications.

All five desktops contain technology considered bleeding-edge just six months ago, such as the Pentium 4 processor with an 800-MHz front-side bus (FSB), Hyper-Threading, and the Intel Extreme Graphics 2 chipset with dual-channel DDR SDRAM. We left Hyper-Threading at the default set-

## BENCHMARK TESTS

	Processor	Business Winstone 2004
<b>Dell OptiPlex GX270</b>	P4 (3.0 GHz)	18.8
<b>Gateway E-4100-C</b>	P4 (2.6 GHz)	17.5
<b>HP Compaq Business Desktop d530</b>	P4 (2.4 GHz)	17.6
<b>IBM ThinkCentre S50</b>	P4 (2.8 GHz)	<b>19.0</b>
<b>MPC ClientPro 345</b>	P4 (2.8 GHz)	18.7

Bold type denotes first place.  
RED denotes Editors' Choice.  
We tested all systems with 512MB of RAM and Microsoft Windows XP Professional.

tings as supplied by each manufacturer (all except the Dell had HT enabled).

Since all the desktops used similar technology, their performance on Business Winstone 2004 mostly followed the processors' clock speeds: The models with the fastest CPUs (3.0 or 2.8 GHz) generally got the best scores. One surprise came with the Gateway E4100-C (2.6 GHz), which we expected to outperform the HP Compaq d350 (2.4 GHz); instead, it lagged the HP by a tenth of a point. Gateway had installed DDR333 memory in the E-4100-C, while all the others had faster

DDR400 memory; this can explain the slight performance shortcoming. The 865 chipset supports both types of memory. But since the 2.6-GHz P4 has an 800-MHz FSB, it works better with the slightly faster DDR400 memory, which can push data back and forth across the system bus at up to 6.4 Gbps.

We recommend that you spend the extra \$40 or so and get DDR400 SDRAM instead of DDR333. But for day-to-day business applications, any of these systems would truly be fast enough.—*Analysis written by Joel Santo Domingo*

## SUMMARY OF FEATURES

### Client Desktops

Download this table at [www.pcmag.com](http://www.pcmag.com).

■ YES □ NO	Dell OptiPlex GX270	Gateway E-4100-C	HP Compaq Business Desktop d530	IBM ThinkCentre S50	MPC ClientPro 345
Direct price (with monitor)	\$1,114	\$1,189	\$1,193	\$1,199	\$1,199
Processor	P4 (3.0 GHz)	P4 (2.6 GHz)	P4 (2.4 GHz)	P4 (2.8 GHz)	P4 (2.8 GHz)
Installed/maximum RAM	512MB / 4GB	512MB / 4GB	512MB / 1GB	512MB / 2GB	512MB / 4GB
Type of RAM	PC 3200 (DDR400)	PC 2700 (DDR333)	PC 3200 (DDR400)	PC 3200 (DDR400)	PC 3200 (DDR400)
Hard drive formatted capacity/speed	40GB / 7,200 rpm	40GB / 7,200 rpm	40GB / 7,200 rpm	80GB / 7,200 rpm	38GB / 7,200 rpm
Primary optical drive	CD-ROM	CD-ROM	CD-ROM	CD-RW	CD-RW
Graphics chipset	Intel Extreme Graphics 2	Intel Extreme Graphics 2	nVidia GeForce4 MX 440	Intel Extreme Graphics 2	Intel Extreme Graphics 2
Graphics memory	64MB	64MB	64MB	64MB	64MB
Graphics adapter	Integrated	Integrated	AGP	Integrated	Integrated
Network adapter	Intel Pro/1000 MT Net Adapter	Intel Pro/1000 CT Net Adapter	Broadcom NetXtreme Gigabit Ethernet Solution	Intel Pro/1000 MT Net Adapter	Intel Pro/1000 CT Net Adapter
Power supply (watts)	160W	180W	185W	200W	200W
Monitor	17-inch CRT	17-inch CRT	17-inch CRT	15-inch LCD	15-inch LCD
USB 2.0 ports in front/back	2 / 6	2 / 6	2 / 4	2 / 6	2 / 4
FireWire ports	0	0	0	0	0
Parallel / serial / PS/2 ports	1 / 2 / 2	1 / 1 / 2	1 / 1 / 2	1 / 2 / 2	1 / 1 / 2
Speakers (including subwoofer)	1 internal	1 internal	2 internal	1 internal	2 external
Management software	Dell OpenManage Suite	Intel LANdesk Client Manager 6.3	HP Client Manager	ThinkVantage Technologies	LANdesk Management Suite 8
Standard warranty	3 years	3 years	3 years	3 years	3 years
On-site service charge for 1 year	Included	Included	Included	Included	Included
Live toll-free technical-support hours	24/7	24/7	24/7	24/7	24/7

RED denotes Editors' Choice.

with IBM servers, lets you remotely inventory and monitor your PCs and other network devices and even take full remote control of machines. Although ThinkCentre systems are not preloaded with the IBM Director agent, which allows communication with the application, you can download it free from the company's Web site. Non-PC devices can be managed if they have open SMTP ports.

IBM's Remote Deployment Manager, formerly a standalone app, now works together with Director, letting you remotely distribute images, drivers, BIOSs, and applications. This app, which sells for roughly \$2,000 for use with 100 clients, is best used in tandem with the free Software Delivery Assistant and IBM's ImageUltra Builder (\$999 for a 30-client license), which lets you create and manage the many images you wish to distribute.

The ThinkCentre S50 we tested at PC Magazine Labs is even more impressive than IBM's earlier small-form-factor offerings. You can upgrade and repair any part of the system sans tools. Even the

motherboard pops out without help from a screwdriver. The S50's cover is reinforced with steel, so you can set a full-size monitor on top of the system without ever bending the chassis. This can't be said for all small-form-factor machines. You even get IBM's on-board security chipset, which provides true 256-bit

hardware-level encryption.

All ThinkCentres are backed by a three-year parts-and-labor warranty, including three years of on-site service. When it comes to managed PCs, IBM covers all the bases. The Dell OptiPlex line is much improved, but Big Blue still sits atop the heap.

# MPC

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Although MPC (formerly Micron PC) might not be on your list of corporate managed-PC contenders, perhaps it should be. The MPC ClientPro 345 matches up well against its competitors. The line includes two well-designed but inexpensive machines. You can share an OS image between the two, and thanks to LANDesk Management Suite 8, an application licensed from the Intel spinoff LANDesk Software, you can

inventory, monitor, and even update systems remotely. (This version of LANDesk is a bit more intuitive than the older Intel LANDesk Client Manager 6.3, which Gateway is using.)

The 345's two flavors are a small desktop and a larger mini-tower, yet these distinctions are somewhat misleading. If you like, you can stand the desktop up like a mini-tower or lay the mini-tower down like a desktop. The main difference lies in

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the size of the two systems. The desktop, reviewed here, offers three drive bays and four half-height expansion slots, while the mini-tower offers seven bays and seven full-size expansion slots.

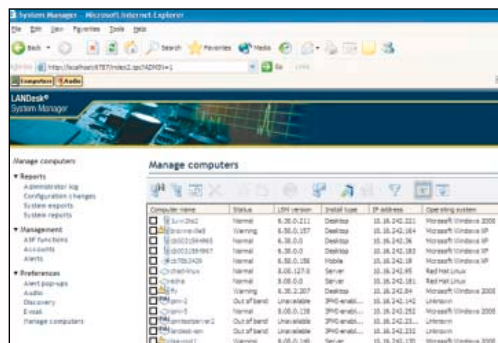
The 345 line is the meat and potatoes of MPC's ClientPro family—machines with solid, midlevel hardware. You can also purchase models from a workstation-like line (ClientPro 545), a budget line (ClientPro 155), and an all-in-one line (ClientPro All-In-One, appropriately enough). As with much of the competition, you can apply the same software image across both form factors in the 345 line, but you can't share an image among the different ClientPro lines.

MPC guarantees that the 345 line will remain in production for at least 12 months, and this could stretch to two years. But like many of the vendors, the company won't make any guarantees about the stability of the platform. If there are changes, the company typically notifies customers through its sales reps or public Web site.

Each system ships with a client known as LANDesk System Manager 8. This lets you inventory and monitor machines locally, but more important, it has an agent that lets you remotely manage the system via LANDesk Management Suite 8 and two

of its plug-ins, LANDesk Patch Manager 8 and LANDesk System Manager 8 Administrator. You can purchase both the suite and the plug-ins for \$89 more.

With Management Suite proper, you can install OS images, load applications,



**LANDesk System Manager 8 monitors hardware performance in real time to ensure system availability, security, and configuration management.**

monitor software licenses, and even gain full remote control of clients—all from a slick, unified graphical interface. Once all is set up, remote control is as easy as right-clicking on a system listed in the suite's menu of available clients and choosing the remote-control option.

With Patch Manager, which integrates seamlessly with the main graphical inter-

face, you can track and update a machine's security patches. The other seamless plug-in, System Manager Administrator, operates much like Intel's old LANDesk Client Manager, still used by the Gateway E-4100 line. You can monitor temperatures, voltages, and fan speeds; check for chassis intrusions; track hard drive and memory space; flash BIOSs; and inventory system hardware.

The small-desktop version of the ClientPro 345, tested at PC Magazine Labs, is on a par with the market's other small-form-factor desktops. You can open its chassis, remove and replace all three disk drives, or install new PCI cards without tools.

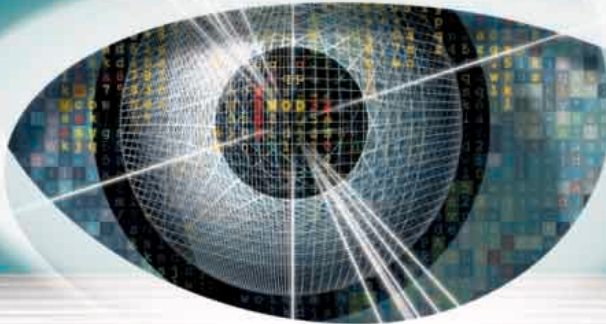
MPC backs the system with a three-year, on-site warranty. For an extra fee, this can be extended to four or five years. And if you like, you can arrange for your own system account manager, or SAM, who will personally handle all of your technical-support and customer service questions.

MPC may not have the management options of other vendors like Dell, HP, or IBM. But it offers a solid solution—both hardware and software—that will satisfy many IT administrators' needs. ■

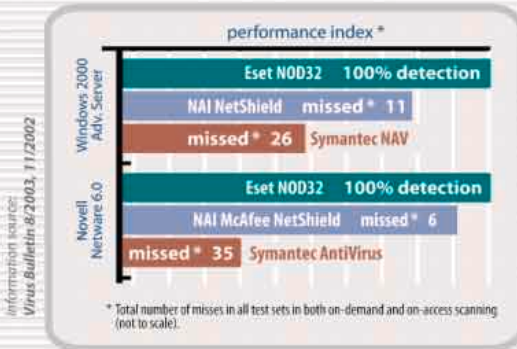


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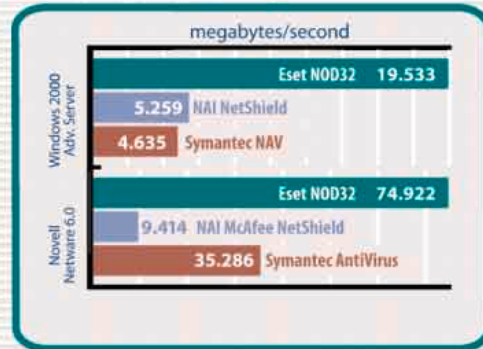
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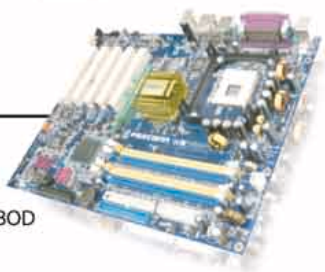
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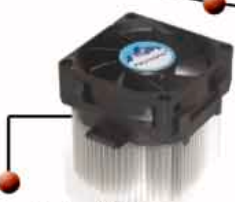


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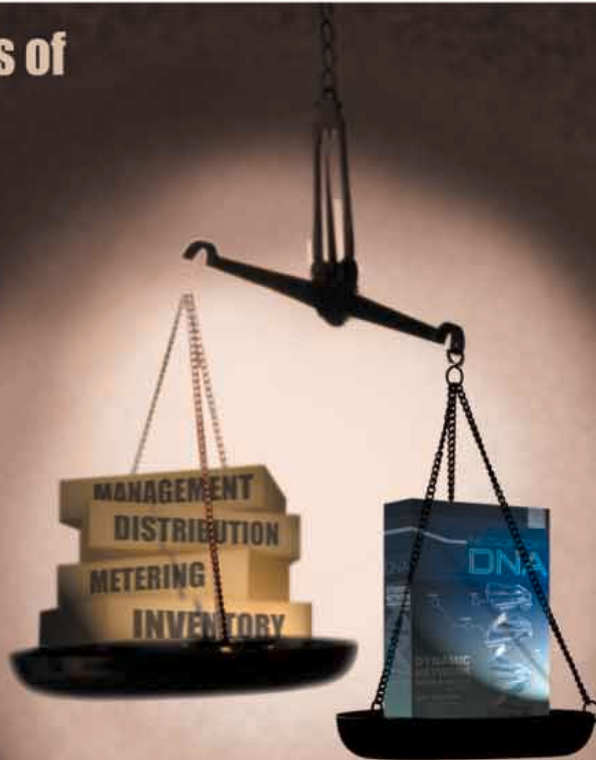
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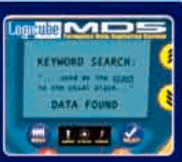
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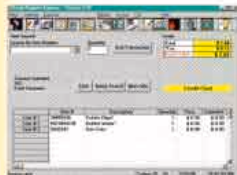
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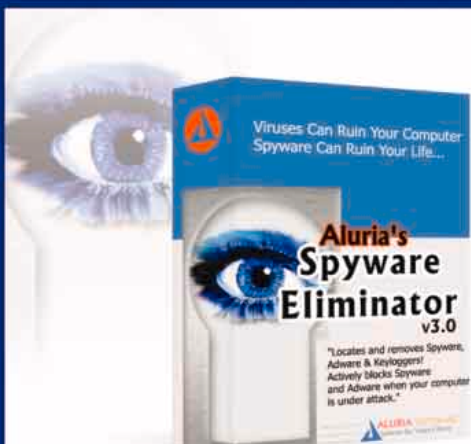
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# AFTER HOURS

TECHNOLOGY ON YOUR TIME

## Fun Software for Your PDA

BY CAROL A. MANGIS

**W**e're well past the days when our personal digital assistants were merely appointment and address repositories. Now that Palm OS and Pocket PC devices come with lots of built-in memory, memory card slots, and beautifully clear and detailed color screens, companies are releasing PDA software that you might once have thought you'd use only on a PC—games, reference materials, and much more. Here is a selective survey of some of the products that have crossed our desks, caught our interest, and taken up a little too much of our downtime!

### games

#### 1. Age of Empires

A favorite real-time strategy game for the PC, Age of Empires is also available for Pocket PC PDAs. The goal is to evolve a Stone Age tribe into a great civilization over a 10,000-year time span. The game loses little in the translation to PDA besides screen size and a multiplayer mode. Graphics are clear and colorful, and controls are surprisingly intuitive in this format. RTS fans will want to pick this one up. \$29.95 list. Pocket PC. Mobile Digital Media, [www.gomdm.com](http://www.gomdm.com). ●●●●●

#### 2. Championship Hearts

This is a colorful version of the classic card game. Test your skill against three animated characters; in case you've never played before or you need point-

ers, you'll find a thorough tutorial. DreamQuest also offers Championship Spades, Euchre, Gin, and Cribbage. \$19.95 direct. Palm OS and Pocket PC. DreamQuest Software, <http://dq.com>. ●●●●●

#### 3. Insaniquarium

One of the best new PDA games we've seen is Insaniquarium, which takes the joy and anxiety of maintaining an aquarium and turns these things into a super-charged Tamagotchi-like experience. You're given a few little guppies to start with, but you must continually buy new fish and the food they need to keep the game going. The fish—um—excrete coins to replenish your account. Meanwhile, you have to protect them against nasty

WHAT THE RATINGS MEAN

- EXCELLENT
- VERY GOOD
- GOOD
- FAIR
- POOR

aliens by tapping furiously at your screen. Your adrenaline will definitely flow. \$14.95 direct. Palm OS and Pocket PC. Astraware Ltd., [www.astraware.com](http://www.astraware.com). ●●●●●

#### 4. Links PocketPC

Golf moved onto the PC screen a long time ago, and Microsoft Links is one of the most popular title franchises. The Pocket PC version lets you play as Sergio Garcia at a variety of real-world courses, including Chateau Whistler; you can add other players and courses with forthcoming expansion packs. The game is surprisingly realistic, with sharp colorful graphics and accurate physics. Fore! \$29.99 list. Pocket PC. Handmark Inc., [www.handmark.com](http://www.handmark.com). ●●●●●

#### 5. Mars Needs Cows

Who could resist a game called Mars Needs Cows? We can't. The object is to move various farm animals around the squares till they're in the right places to be beamed up by aliens. It's a puzzler that seems simple at first but can quickly get very challenging. Your reward is seeing the cute cows, pigs, and chickens twirl around as they rise into the spaceship.



\$14.95 direct. Palm OS and Pocket PC. Astraware, [www.astraware.com](http://www.astraware.com). ●●●●●

## 6. PDA Playground

PDA Playground turns your PDA into a fun machine for kids age 3 to 7, with six colorful games. And since you can specify a required password to exit the app, you can keep the little ones from getting into your data. The games include Paint and Draw, for creating mini-artworks; Match, a Concentration-type game; and FollowMe, which challenges kids to re-create increasingly complex patterns. \$19.95 direct. Palm OS and Pocket PC. DataViz Inc., [www.dataviz.com](http://www.dataviz.com). ●●●●●

## 7. PopCap Puzzle Pack

Puzzle solving is a perfect activity for commuters, travelers, and anyone else who has some time to kill. This package brings together five colorful games from PopCap: the ever-stunning Bejeweled, Mummy Maze, Atomica, Alchemy, and Seven Seas. There's enough replayability here to last you through many trips, long lines, and waits in the dentist's office. Graphics are crisp, and the sound effects enhance the experience. Our only grievance: For such simple games, some take a bit too long to load. \$29.95 direct. Palm OS. Mobile Digital Media, [www.gomdm.com](http://www.gomdm.com). ●●●●●

## 8. Ricochet

Based on block-breaking games such as Breakout and Arkanoid, Ricochet jazzes up the genre with three levels of difficulty, four environments, smooth animation, and lots of power-ups that can be either helpful



7



6

## ONLINE MORE ON THE WEB

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or harmful to game play. Your object is to try to clear each screen by bouncing your "ion sphere" off the shield and hitting the blocks. It may sound simple, but each level offers new challenges.

\$14.95 direct. Palm OS and Pocket PC. Astraware, [www.astraware.com](http://www.astraware.com). ●●●●●

## reference

### 9. Audio Translator

Audio Translator can help international travelers speak the language; it converts bidirectionally between English, French, Spanish, Italian, and German. It includes over 40,000 words and 5,000 phrases. If your PDA is sound-enabled, you can even listen to proper pronunciations. The program comes on a rewritable MMC card, so you can annotate, highlight, and bookmark to your heart's content, and the exhaustive documentation answers any question you could possibly have about the program. \$39.95 direct. Palm OS and Pocket PC. Mobile Digital Media, [www.gomdm.com](http://www.gomdm.com). ●●●●●

### 10. Britannica Concise Encyclopedia



The intellectually curious—or those who love to argue over obscure facts—can instantly find information about the Manawatu River, Johann Pachelbel, or baboons in this amazing mobile version of the famed *Encyclopaedia Britannica*. It offers over 24,000 entries and more than 900 images (including photos and maps). As with Audio Translator, you can add your own notes, drawings, and bookmarks. \$39.95 direct. Palm OS and Pocket PC. Mobile Digital Media, [www.gomdm.com](http://www.gomdm.com). ●●●●●

### 11. Leonard Maltin's 2004 Movie and Video Guide

Toss some popcorn in the microwave, and then check out Leonard Maltin's 2004 Movie and Video Guide. It couldn't be handier for movie junkies and trivia buffs. You get full descriptions, reviews, and ratings of over 19,000 films (released through 2002) and filmographies for over 35,000 actors and directors, with numerous search options. You can also create a customized catalog of movies you own and ones you love or want to see, and upload movie events when you sync your Palm. Download, \$19.95 direct; CD-ROM or rewritable MMC, \$24.95. Palm OS. LandWare Inc., [www.landware.com](http://www.landware.com). ●●●●●

## other fun stuff



### 12. Dilbert Dose-A-Day

Can't get enough of that hapless office geek? Dilbert Dose-A-Day is a virtual version of a daily tear-off

calendar that includes 365 days of Dilbert cartoons. The calendar begins on the date you install it, an advantage over paper. And if you love a particular cartoon and want to go back to it, just add it to a list of favorites. You can also scroll back through past cartoons, though you can't preview upcoming days. DataViz also offers calendars featuring golf tips from Gary McCord and *Close To Home* comics.

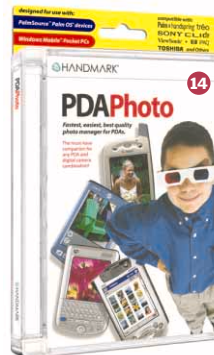
\$19.95 direct. Palm OS and Pocket PC. DataViz Inc., [www.dataviz.com](http://www.dataviz.com). ●●●●●

### 13. Merriam-Webster Crossword Puzzles and Word Challenges

This is a terrific package for word lovers of all types and talents. It consists of 1,000 puzzles of various levels of difficulty. In Text Twist, you make as many words as you can out of six letters, within a time limit. WhatWord gives you a grid of five letters by five letters; you rearrange them to form words, also against the clock. And Link Letters challenges you to form as short a chain as possible from one word to another by changing, adding, and subtracting letters. \$29.95 direct. Palm OS and Pocket PC. Mobile Digital Media, [www.gomdm.com](http://www.gomdm.com). ●●●●●

### 14. PDA Photo

PDA Photo gives you a handy way to organize and view photos on your handheld. You can sort them by date, size, or location; create your own categories and even batch-categorize photos; display photos as thumbnails; beam them to others; and view them as slide shows. Most functions are intuitive, but we are



surprised that no help documentation is included (though you can go to the Web for assistance). \$29.99 list. Palm OS and Pocket PC. Handmark Inc., [www.handmark.com](http://www.handmark.com). ●●●●●

# GEAR & GAMES



## Untethered Gaming

Want to get your gaming console online without running cables? These wireless products can do the trick.—*Matthew D. Sarrel*

Easily add the Microsoft Xbox to your wireless network with the **Microsoft Xbox Wireless Adapter**. Installation is simple: Plug it in, put the installation disc in your Xbox, and follow the instructions. The adapter is 802.11g, so throughput speed is up to 54 Mbps, with a longer range than that of the Nyko Net Extender. The only drawbacks are the high price and the inability to turn the unit off. An auto-sensing Ethernet port would alleviate that concern and conserve power.

\$139.00 list. Microsoft Game Studios, [www.xbox.com](http://www.xbox.com). ●●●●●

Essentially a pair of RF-to-Ethernet bridges, the **Nyko Wireless Net Extender** is a simple and flexible solution for the Xbox or the Sony PlayStation 2 (even other types of network devices), with a range of up to 100 feet and a maximum throughput of 1.5 Mbps. The limited speed is fine for broadband gaming but not good enough for LAN gaming. Installation is a breeze, and the versatility of these units makes them adaptable. The base unit includes a switchable pass-through to connect a computer as well, but doing so will disable RF operation, taking your console off-line.

\$129.99 list. Nyko Technologies Inc., [www.nyko.com](http://www.nyko.com). ●●●●●

## In Control

Couch potatoes, rejoice! The **Streamzap PC Remote** is a full-featured IR remote control for your PC that communicates with a USB IR receiver plugged into your computer. A simple installation program, coupled with an excellent on-screen tutorial, will have you running in under 5 minutes. Unlike its 15-button competitor from Keyspan, the PC Remote has 35 keys, 3 of which can launch your favorite programs. The PC Remote supports over 100 programs, including all of the popular multimedia players. —*Craig Ellison*

\$39.95 list. Streamzap Inc., [www.streamzap.com](http://www.streamzap.com). ●●●●●

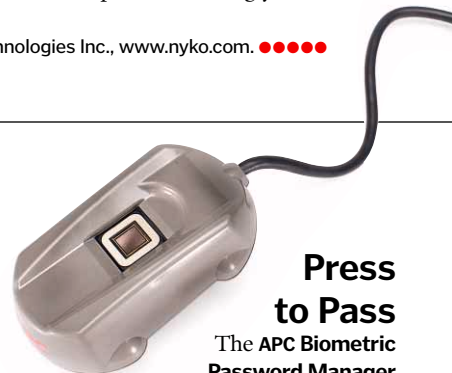


## Press to Pass

The **APC Biometric Password Manager**

doesn't just put your online passwords at your fingertips, it uses your fingerprints to remember passwords for you. Compatible with Windows XP, Me, 2000, and 98, this USB device can store an unlimited number of Web site log-on names and passwords. Up to 20 different users can share a single unit, which uses TruePrint security technology to scan fingerprints below the surface of the skin, so it isn't affected by dry, dirty, or oily skin. Too much reliance on this device may be a big problem, though, as you'll discover if you ever find yourself without it.—*Peter Suci*

\$49.99 list. APC Corp., [www.apc.com](http://www.apc.com). ●●●●●





# Best New Console Games

## Backyard Wrestling: Don't Try This at Home

This creative (and brutal) wrestling game lets you use the environment as a weapon: Hurl opponents into walls, barbecues, and fish tanks and use items such as barbed wire and baseball bats to teach them a lesson. An aggressive soundtrack and the hysterical talk-show mode make this innovative title well worth playing.—MDS  
\$49.95 list. Xbox and PS2. Eidos Interactive Ltd., [www.bywgame.com](http://www.bywgame.com). ●●●●●



BACKYARD WRESTLING

## Crimson Skies: High Road to Revenge

Crimson Skies will appeal to Walter Mitty-like buzz boys who want to reach out and get a few aerial kills. The single missions are fun, the voice acting decent, and the story engaging. Online content includes downloadable planes.—Joel Santo Domingo  
\$49.95 list. Xbox. Microsoft Game Studios, [www.xbox.com](http://www.xbox.com). ●●●●●

## Dungeons and Dragons Heroes

You and your comrades are heroes raised from the dead to save the kingdom from your evil-wizard nemesis. Richly textured environments, detailed character models, stunning magical effects, and easy-to-control camera angles and zoom make this one great-looking game. Combat is a fair mix of hack and slash with some strategy and tactics thrown in.—MDS  
\$49.95 list. Xbox. Atari, [www.us.atari.com](http://www.us.atari.com). ●●●●●

## Gladius

Playing as a gladiator, you journey through the land, building a reputation with turn-

GLADIUS



based battle. With practice and luck, you can advance through tournaments and prevent Imperia from starting a war. Relying on its epic story, this role-playing game has heavy combat elements that stress tactics. Graphic and audio quality is excellent, and multiplayer modes are competitive and fun.—MDS  
\$49.99 list. Xbox, Nintendo GameCube, PS2. LucasArts, [www.gladius.com](http://www.gladius.com). ●●●●●



DUNGEONS AND DRAGONS

## Project Gotham Racing 2

Project Gotham racing is a rare sequel, one in which a popular original is improved on. The lush backgrounds and active reflections on the cars look wonderful. Via Xbox Live, you can race online and download ghosts (replays of your best runs), with which to challenge your rivals.—JSD  
\$49.99 list. Xbox. Microsoft Game Studios, [www.xbox.com](http://www.xbox.com). ●●●●●

## Rise to Honor

Jet Li did the voice acting and motion capture and also served as technical advisor for this game. The innovative 360-degree fighting system takes a while to learn, but you'll reap rewards as you quickly and accurately target enemies for multidirectional combination attacks. An absorbing story will keep you coming back.—MDS  
\$49.95 list. PS2. Sony Computer Entertainment America Inc., [www.scea.sony.com](http://www.scea.sony.com). ●●●●●

## Top Spin

This adrenaline-packed tennis game feels like a first-person shooter; eye/hand coordination and quick reflexes are prized over finesse. You can play on a variety of surfaces, and tournaments include all the Grand Slams. Create a customized pro to play as.—Sahil Gambhir  
\$45 street. Xbox. Microsoft Games Studios, [www.xbox.com](http://www.xbox.com). ●●●●●

## QUICK CLIPS

### Sibelius 3

Sibelius 3 blurs the line between a notation program (for creating detailed sheet music) and a sequencer (which helps you compose, edit, and arrange songs). Among its impressive array of features are flexible real-time MIDI recording and playback; composers' aids, including an Arrange command that morphs a simple tune into an orchestral score; the ability to scan and convert sheet music to Sibelius format; and integration with the included Native

Instruments Kontakt Silver sample player (a hi-fi software instrument that plays your score with appropriate sounds).—Emile Menasché

\$599 direct. Sibelius USA Inc., [www.sibelius.com](http://www.sibelius.com). ●●●●●



### Xfire

Chat, connect with friends online, and get playing: That's been the dream of many gamers. Xfire lets you know what your friends are playing and on which servers. It works with many of the most popular titles, including server- and non-server-based shooters, strategy games, and role-playing games. Best of all, it gives you direct access to selected games. You'll also be able to send and receive instant messages while you play.—Peter Suciw  
Free download. Ultimate Arena, [www.xfire.com](http://www.xfire.com). ●●●●●

### RedShift 5

Aspiring astronomers, and anyone who is curious about our universe, will find many hours of fascinating exploration in this accessible multi-media space simulation. Look at the constellations from anywhere in our solar system, at any time in history; take a guided galaxy tour; view new hi-res photos of distant worlds; keep a Sky Diary. Free Web updates are continually available.—CAM  
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# BACKSPACE

## LAW & ORDER: BACKSPACE....HEY, WHY NOT?

Edited by Don Willmott

- ▶ Backspace on the Road: Cannon Mountain, New Hampshire.



- ◀ Looks as if Poughkeepsie, New York, is all wet. (MSN Maps & Directions)



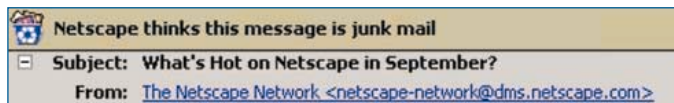
- ▶ This typo is for the birds. (Yahoo! Shopping)



### Video Toaster 3 Dual Xeon Cube Turkey System

This NewTek Video Toaster 3 Cube Case comes Processors, 1 GB of ECC Registered DDR an 80 SCSI U320 hard drive space made up of four 3 to 320 mb/second.

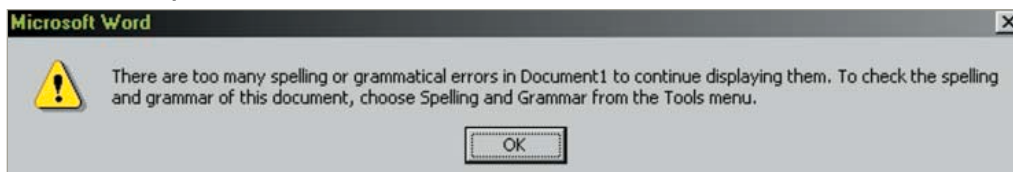
- ▼ Netscape seems to be suffering from a slight case of low self-esteem. (Netscape Mail)



- ▼ That's one wild supermarket. (Yahoo! Picture Gallery)



- ▼ In other words, you're such a bad speller that you actually wore out the spell-checker. (Microsoft Word)



[www.pcmag.com/backspace](http://www.pcmag.com/backspace)

If your entry is used, we'll send you a *PC Magazine* T-shirt. Submit your entries via e-mail to [backspace@ziffdavis.com](mailto:backspace@ziffdavis.com) (attachments are welcome) or to Backspace, *PC Magazine*, 28 E. 28th St., New York, NY 10016-7940. Ziff Davis Media Inc. shall own all property rights in the entries.

Winners this issue: Robert Hoppe, Kelly Jones, Owen Kosmicki, Jim Lopina, Ray Mansell, and Michael Segal.



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