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Forward Thinking

TAKING IT WITH YOU

LATELY, I'VE BEEN LIVING with a couple of gadgets that let me carry information with me wherever I go. One is a phone, and the other is a watch—and they're anything but conventional. Both let you always have a certain amount of information with you—your calendar, messages, and news—but there is a downside to the easy access they offer: the distraction. It's annoying when you're in a meeting and someone's cell phone rings. Even worse is when everyone in the meeting is checking e-mail.

But when all this information is on your wrist, compulsive checking is even more tempting. As a result, you miss the meeting, even if you're there. I admit that I'm as guilty as the next guy. Sometimes, this gets out of control. It's as if we all have mild cases of attention deficit disorder.

We need to be more intelligent about how we use such gadgets, shutting out the distractions and focusing on the people we're with. And we need to pay more attention to what's really important instead of catching the latest e-mail.

THE WRIST COMMUNICATOR



IF YOU WANT your watch to deliver the news headlines, local weather, and stock prices, you'll like Microsoft's new wrist communicators. That was the promise of Microsoft's SPOT technology, which Bill Gates first showed off in the fall of 2002. The first few watches are now beginning to appear. Over the past few weeks I've tried out two of them, along with

the information service, now called MSN Direct.

The service operates on unused portions of the FM radio band to send out information in a local area. Each watch has a unique ID and pulls in only the information you ask for—news, sports, stock prices, or messages. The bandwidth is limited, so you get only headlines and short messages. But the idea isn't to spend time reading your watch. Rather, a quick glance every now and then will keep you up to date.

You can set up the service to deliver several kinds of information, including national, business, international, or sports news headlines; stock prices of specific companies; and basic market indices. Using a desktop utility, you can send calendar items to the watch as well as receive personal messages sent via MSN Messenger. It can also receive multiple watch faces with alarms and timers. I found the Glance mode the most useful; it cycles through the information on your watch, so you can just glance at your wrist and get information.

Some of the services aren't working yet, but

Microsoft says that soon you'll be able to customize MSN Direct to get information about specific sports teams. And I like the idea of getting the traffic report for a selected route. But such a service is still a ways off. The MSN Direct service costs \$9.95 a month or \$59.95 a year, plus the cost of the watch.

I've tried the service with two watches: a pre-release version of the Fossil Wrist Net, which looks somewhat like Dick Tracy's wrist radio, and a Suunto N3 wrist top. Both work well, but they're definitely designed for people who like big watches.

The Fossil watch starts at \$179, and the Suunto wrist top costs around \$200. The Suunto charger is much smaller and easier to travel with, which is important because both watches need to be charged every two days.

Microsoft claims it has coverage in 100 of the largest cities in the country. So far, MSN Direct has been working fine for me in New York, San Francisco, and Las Vegas. But I couldn't get a signal in suburban Connecticut.

For now, MSN Direct watches are more interesting as gadgets than as information-gathering devices. At first, wearing one was fun, although I often found myself referring to it as my "trivia watch," because every time I glanced at the screen I read some news headline I didn't know about.

I'm really looking forward to being able to customize the information for my needs. And in terms of design, I just wish the watches were a little smaller.



When information is on your wrist, compulsive checking is even more tempting.

Forward Thinking

MICHAEL J. MILLER

DO-IT-ALL CELL PHONES

TODAY'S CELL PHONE is a far cry from the first Motorola StarTAC I saw at a consumer electronics show a decade ago. Now everyone is carrying a lightweight phone with better coverage, features, and pricing than ever. Almost every phone on the market has SMS messaging and an address book, and an increasing number of phones are adding built-in cameras.

I've been trying out a couple of new phones that do it all—the palmOne Treo 600 (formerly from Handspring, before it merged with Palm) and the Motorola MPx200 with Microsoft Smartphone 2002 software. For someone like me, who spends a lot of time on e-mail, the Treo 600 is by far the best single device I've ever carried: It works as a phone, a PDA, and a wireless e-mail device. It wasn't the best performer in our feature story in this issue, but it's the best fit for my needs.

As a phone, the Treo 600 is not tiny, but it's small enough to carry in my pocket. It works well as a phone—with a headset or by just holding it to the side of your head, which is a problem with some other devices in this class. And I like the speakerphone and the large memory for addresses. Its keyboard is a bit narrower than those of RIM BlackBerries or previous Treos, but I got used to it.

For a PDA, the screen is low-resolution but quite bright. And since it runs Palm OS, it works very well as a PDA with all Palm applications. The built-in camera is adequate in a pinch but not great, and the SD slot lets you add data or applications. And as an MP3 player, it delivers very good sound.

Most important, it's well integrated. You can dial a number easily from the address book; the camera connects well with SMS messaging; and e-mail is hooked into a decent Web browser. I've been using it with Good Technology's GoodLink software for receiving, sending, and syncing with Microsoft Exchange. The Treo 600 is an excellent choice if your work revolves around e-mail.

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For someone like me, who spends a lot of time on e-mail, the Treo 600 is by far the best single device I've ever carried.
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The Motorola MPx200 is one of the first phones to support Microsoft's Smartphone 2002 operating system. (The Samsung i600 is the other one.) It's much smaller than the Treo 600, but it has many of the functions you'd expect from a Pocket PC device. It syncs with Outlook's address book and calendar and can send and receive e-mail. But since the screen is small—and it uses a phone keypad for input—you won't want to use it for handling lots of e-mail.

Like the Treo 600, it has an SD slot. And it comes with Windows Media Player, so you can use it as an audio device. The MPx200 is cool, but looking up an address or browsing the Web seems a bit slower than with the Treo 600. The MPx200 is a good choice if you want PDA functions in a phone.

Both phones were a lot of fun to use but have some caveats. First, they're expensive: The Treo 600 is available from a number of carriers for \$449 and up, while the Motorola MPx200 costs about \$300 from AT&T (before a \$150 rebate). And the data plans can be pricey if you get a lot of e-mail.

Second, you'll want to choose your network carefully, because data coverage (GPRS) doesn't seem to be as far-reaching as voice coverage. With both phones, I occasionally ran into situations where the voice service was working but the GPRS data service wasn't. Sometimes resetting the phone fixed the problem, but that's a pain.

After using these phones, I'm convinced that I'd much rather carry a phone with data features than both a phone and an e-mail device or a phone and a PDA. For now, the Treo 600 is the best product for me.



IT'S THE COVERAGE THAT MATTERS

ONE THING THAT USING all these devices has taught me is the importance of service coverage. We're still a long way from a phone, e-mail device, or even data watch that has coverage everywhere. If you are considering buying any of those products, I strongly urge you first to check the coverage where you live and

work. Otherwise, you may just end up being stuck with nothing better than an expensive paperweight.

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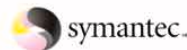
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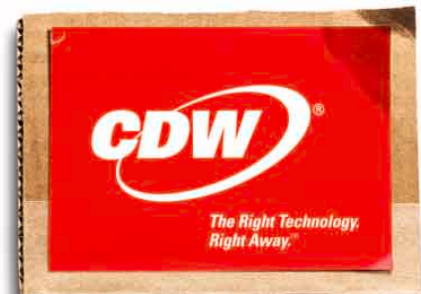


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80% of U.S. enterprises will have spam filtering installed by year's end, according to research firm Gartner.

24 First Looks

- 24 ASUS DigiMatrix Media PC ▼
- 25 Gateway Media Center FMC-901X
- 26 Gateway AR-230 DVD Recorder
- 28 SMC EZ-Stream Universal Wireless Multimedia Receiver SMCWMR-AG



- 28 TiVo Series 2
- 30 HP DVD Writer DVD400i ▼
- 30 Plextor PX-708UF ▼
- 32 Sony DRU-530A Dual RW Drive
- 32 TDK 8X Indi DVD Multiformat Burner
- 35 ConceptDraw V Professional
- 35 Microsoft Office Visio 2003 Professional
- 36 SmartDraw 6.2 Professional Plus
- 36 PocketMac 3.0
- 40 Creative Sound Blaster Audigy 2 ZS Platinum Pro
- 40 Creative GigaWorks S750
- 41 QuickBooks Customer Manager
- 42 Microsoft Windows Rights Management Services 1.0
- 42 MobiTV
- 43 NetSuite 9.1



ALSO IN THIS ISSUE

- 45 Feedback
- 118 Backspace

COVER STORY

64



Can E-Mail Survive?

Last year, spam mail reached critical mass, accounting for more than half of all e-mail. Meanwhile, malicious users continue to find ways to use e-mail to propagate viruses and scams. So how do you cope? We look at a slew of **desktop, Internet, and mobile mail clients**, as well as **utilities and spam blockers** to help you manage your in-box. For businesses, we review e-mail server options that go beyond Microsoft Exchange.

ON THE COVER

The E-Mail Mess
page 64



6 Fun Photo Utilities
page 114

Looking Good: Media PCs
page 24

Picture Charts in Excel
page 58

Notebook Technology
page 96

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19 Pipeline

- 19 Microsoft's Portable Media Center debuts.
- 19 Yahoo!: Change the Net to beat spam.
- 19 Music downloaders change their ways.
- 20 Tech support: Bringing it in-house.
- 20 A wireless broadband videophone.
- 20 Wi-Fi—in the car?
- 22 **COMING ATTRACTIONS:** Fujitsu LifeBook N5000, Canon ZR Series camcorders, CorelDraw Graphics Suite 12, Adobe InDesign CS PageMaker Edition.



NOTEBOOK TECH

96 What's New With Notebooks

Thanks to shrinking components and interesting new technologies, notebook technology is about to get cooler, faster, and better. Displays will get new dimensions, wireless will get faster and more secure, and mobile processing will become more efficient than ever. Read up on the new advances expected this year, and get a glimpse at what's farther down the road.

56 Solutions

- 56 **Your Library Online:** Visit your library's Web site for a wealth of research tools not available on the "ordinary" Internet.
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- 60 **Internet Business:** With the help of wireless technology, ZipCar takes car sharing to Boston, New York, and D.C.
- 61 **Internet Professional:** Here's a look at the options for handling payment in your online store.
- 62 **User to User:** Our experts show you how to capture a large Excel image and how to retrieve e-mail for only some of your Outlook 2003 accounts.

Opinions

- 5 Michael J. Miller: Forward Thinking
- 49 Bill Machrone: ExtremeTech
- 51 John C. Dvorak
- 53 John C. Dvorak's Inside Track
- 55 Bill Howard: On Technology

Personal Technology

114 After Hours

Photo Finishers: With the growing popularity of digital photography, many software utilities are available for spiffing up your digital photos. We review the most intriguing ones here.

116 Gear & Games

Sierra's Homeworld2; Max Payne 2; Creative Sound Blaster Wireless Music stereo receiver; Intrigue Harmony SST-659 self-programming remote.

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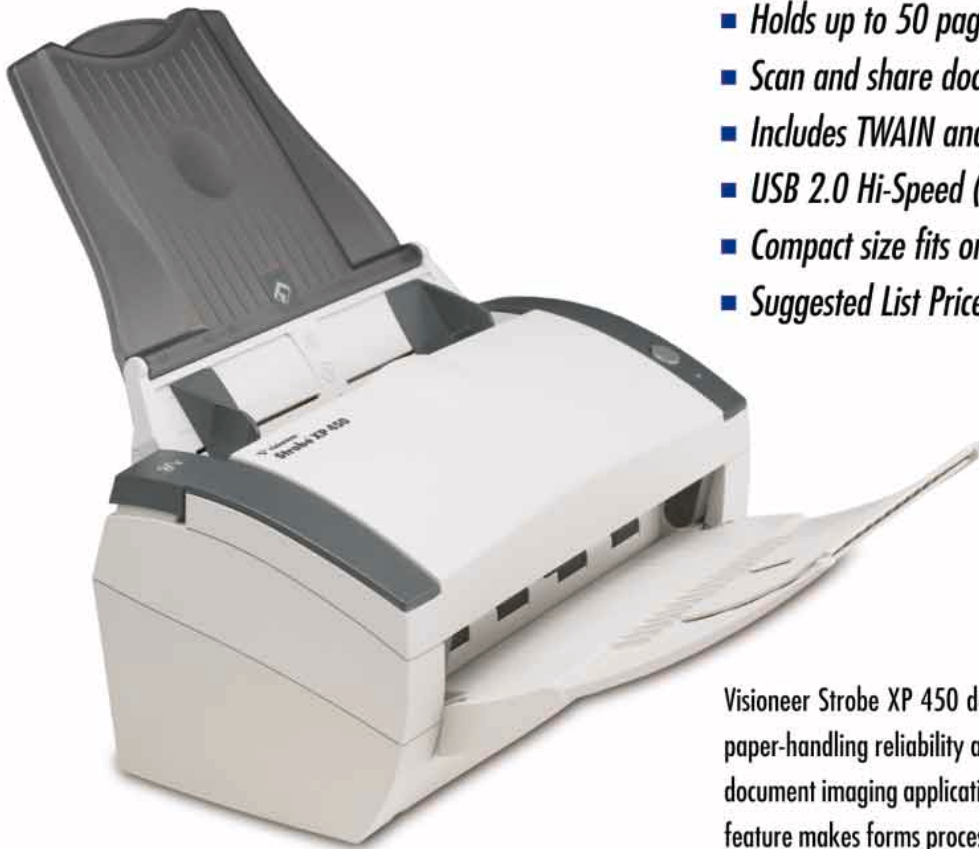
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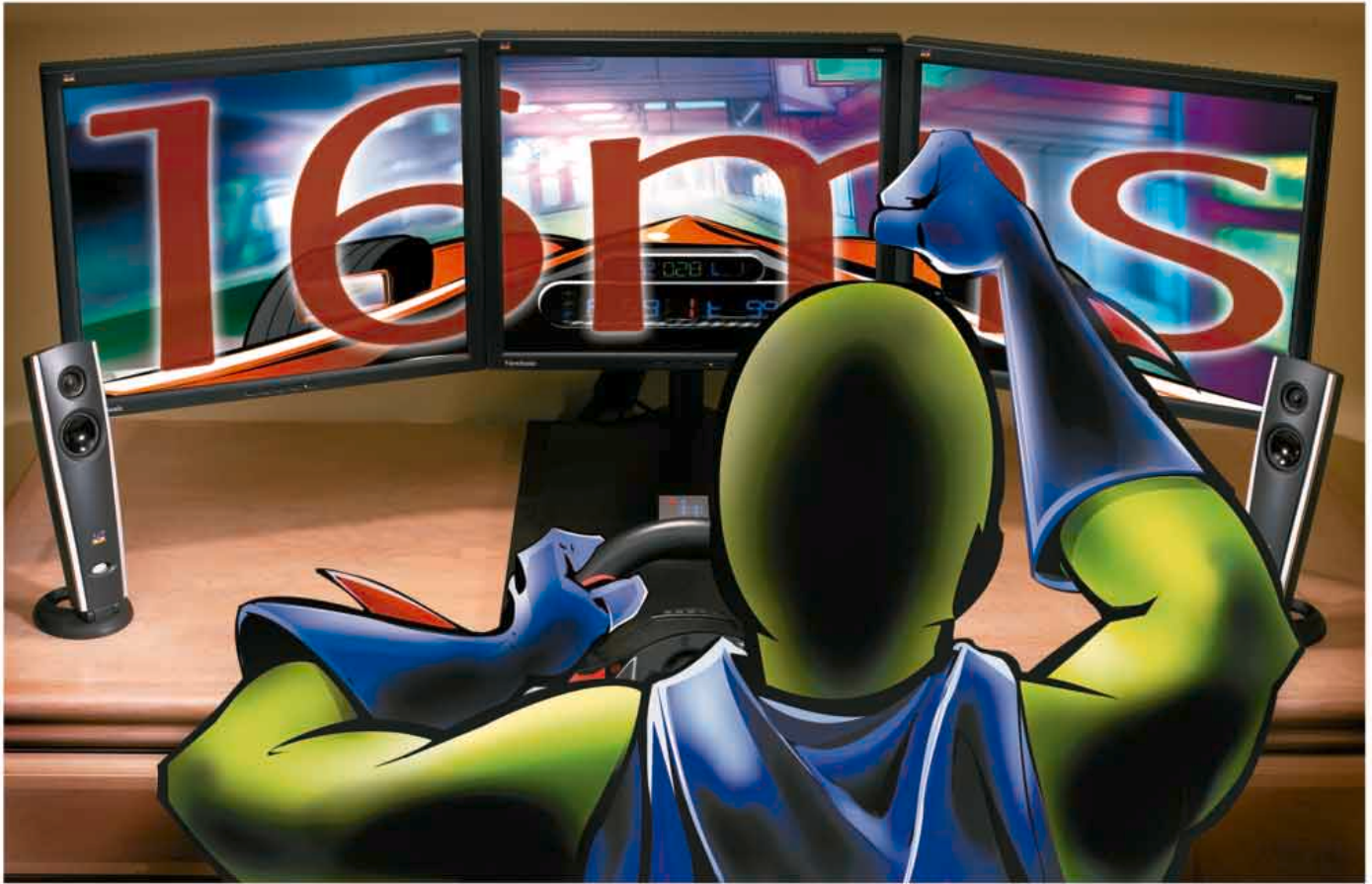
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*Repeater function works with Buffalo Access Points and Routers only, but can communicate with other manufacturers' 802.11b and 802.11g client adapters. **Laptop Magazine December 2003 issue - applies to WLA-G54C repeater only.

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PIPELINE



Theater in Your Pocket

Microsoft eyes portable entertainment content.

Want to store every episode of *Friends* in your pocket for the train ride to work? Microsoft is pursuing such an application with its new Portable Media Center, which it unveiled at January's Consumer Electronics Show (CES) in Las Vegas.

Microsoft Portable Media Center is a new version of media software for pocket-size devices with 3.5-inch displays, 64MB of RAM, and hard drives with capacities of 20GB, 40GB, and 60GB (see the photo). Microsoft is partnering with hardware vendors, including original device manufacturers such as AboCom Systems and Tating and OEMs Creative Labs, iRiver, Samsung, Sanyo, and ViewSonic, which will ship gadgets priced from \$400 to \$700 in the second half of this year. The software is based on Windows CE and syncs with any Windows XP system to provide digital videos, feature-length movies, digital music, TV shows, photos, and music videos on the go.

Microsoft's software uses Windows Media 9 Series codecs and the WMA format. "The compression is strong enough to store 175 hours of video, enough for every episode of *The Simpsons*, on the 40GB device," says Frank Barbieri, a Microsoft group product manager.

Portable Media Center hardware and software will have content navigation shortcuts. For example, the OEM devices have preset buttons for jumping to favored content. The gadgets will have USB 2.0 connectivity, headphones, and A/V output for streaming to a TV, stereo or other device. Battery life will be "at least long enough for one full-length movie," claims Barbieri. Microsoft has also partnered with CinemaNow to provide DVD-quality digital movies for rental. Napster is the primary partner for music content, as it is for Microsoft's existing Media Center platform.

With Microsoft trailing Apple in courting the entertainment industry, the new gadgets and partnerships could heat up the competition. While a Portable Media Center device will be more expensive than an Apple iPod, extras such as video and movie playback could bring a quick answer from Apple. —Sebastian Rupley

Yahoo! to Slam Spam

THE ANTISPAM WAR IS GAINING new momentum. On the heels of the new national CAN-SPAM legislation, Yahoo! has announced ambitious plans to launch an e-mail authentication system that could change the way the Internet works.

The Yahoo! system calls for a strategy to "attack the spam problem where it should be attacked—at the absolute root," says Brad Garlinghouse, a Yahoo! VP. New software called Domain Keys, available for free later this year, will authenticate the outbound domains of every e-mail message using unique embedded keys within e-mail headers. The keys will authenticate through comparison with public keys registered by the Internet's Domain Name



System (DNS). Theoretically, policing which domains mail is sent from could help block junk mail.

"To get the right kind of cascading effect going in fighting spam," Garlinghouse contends, "we believe verification of domain identity comes first." —SR

MICROSOFT: BACK TO COURT

RealNetworks filed suit against Microsoft in December 2003 for allegedly violating state and federal anti-trust laws. According to the complaint, "Microsoft has used its monopoly power to restrict how PC makers install competing media players while forcing every Windows user to take Microsoft's media player, whether they want it or not." The suit further alleges Microsoft's "failure to disclose interface information."

A BETTER BLUETOOTH

Bluetooth, the fast-growing wireless communication standard, has always suffered from sharing the 2.4-GHz spectrum with cordless telephones, microwave ovens, and some wireless LANs. In December, the Bluetooth Special Interest Group made Adaptive Frequency Hopping (AFH), which seeks out free frequencies, part of the official Bluetooth specification. Devices with better performance and no interference are expected to ship by the end of the first quarter.

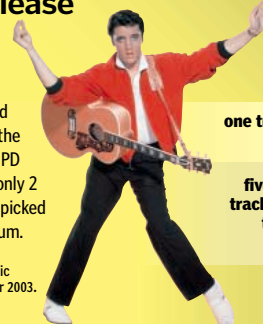
GOOGLE HITS THE BOOKS

Following similar moves from Amazon.com, Google has developed a service called Google Print, which lets users search for and view online excerpts from books. Several publishers, including Knopf and Random House, have partnered with Amazon.com. So far, Amazon has more titles and publishers than Google.

Just the Hits, Please

Following recording industry lawsuits, overall song downloading has plummeted, and people are inclined to download one hit from an album but not the whole album. Researchers at NPJ Group found late in 2003 that only 2 percent of music downloaders picked five or more songs from an album.

Based on surveys of 40,000 online music downloaders from August to December 2003. Source: NPJ Group, December 2003.



Percentage of U.S. music downloaders who usually select

one track from an album **85%**

five or more tracks but not the entire album **2%**

an entire album **1%**



Tech Support Coming Home?

While many tech companies are outsourcing their technical support services to third-party facilities—many of which are offshore—some companies are bucking the trend. In responding to *PC Magazine's* latest Service and Reliability survey, many readers criticized manufacturers such as Dell, Gateway, and HP for moving their support operations overseas to cut labor costs.

In a move that may have resulted from such complaints, Dell recently shifted technical support operations for two of its corporate computer lines back to the United States. Calls previously routed to phones in Bangalore, India, are now handled in Idaho, Tennessee, and Texas.

And in early December, MPC Computers moved its entire support operation in-house. It had been handled by DecisionOne, a support company near Philadelphia, but the two companies reached an impasse when MPC asked for improvements in DecisionOne's performance. "When I tried to hold them to certain metrics, they said they would have to raise our rates significantly or move our support offshore," says Jeff Fillmore, a vice president at MPC.

Is the trend developing away from offshore technical support? Maybe not. According to research firm IDC, 23 percent of IT services will be delivered from offshore centers by 2007, compared with only 5 percent in 2003.—Cade Metz

A Wireless Videophone

THE HANG-UP WITH VIDEO-conferencing has always been that it's a hassle to set up and use. And who wants to be bound to a computer just to call someone? D-Link is hoping it has solved that problem with its wireless broadband videophone.

The new D-Link Wireless i2eye videophone (\$230 street) is designed to work with a standard television using RCA jacks. Its camera—which has a microphone, remote control, and an adjustable tilt and zoom lens—includes built-in support for



802.11b, so it can connect to a wireless home network. By hooking up to a home network, the Wireless i2eye can take advantage of any broadband Internet connection without having you string Ethernet cables to your den or living room.

"It's the first wireless broadband videophone over IP for

videoconferencing," says Daniel Kelley, D-Link's director of marketing. More important, says Kelley, the Wireless i2eye can transmit full-duplex audio and full-motion, 30-frame-per-second video at a compressed 640 by 480 pixels, meaning that calls require only about 512 Kbps of bandwidth.

Other systems are designed to bring videophones into living

rooms, but they use wired connections. The Vialta Beamertv TV appliance (\$150 street), for example, uses a dial-up connection.

But will Wireless i2eye calls really be simpler? To reach out and see someone, you'll still have to make an awkward connection over the Internet to other H.232-compliant videoconferencing users. And dialing IP addresses isn't as easy as dialing phone numbers. To reduce the hassle, D-Link is including a free i2eye directory service, which registers the unit with an easy-to-remember phone number for direct dialing. That may turn out to be even more useful than the wireless connection.—John R. Quain

Racy Robots

Hey, is that R2D2? While it may look similar, military aircraft inspired the slick-looking designs for a new line of robots from

start-up company White Box Robotics. Unlike the predetermined features in most robots, White Box's robots will be designed to let each owner choose what his robot will do.

"The basic platform we're going to ship will be a chassis with a motor, Evolution Robotics' software for robot applications, and a VIA motherboard," says Tom Burick, president of White Box Robotics. "Then people can add CD-ROM drives and Webcams for specialized robot applications."

Among the robots that the company has produced is one designed for home security. The software includes facial recognition features so the security robot can wirelessly e-mail a homeowner if an unrecognized person walks through the front door.

White Box Robotics plans to ship its first robots this summer, for "about the price of a PC," Burick says.—SR



Wi-Fi to Your Car

If you can send MP3 files wirelessly around your house using 802.11b, why not pipe music via Wi-Fi to your family car as well? Wi-Fi can transfer music to an MP3 jukebox in the trunk when your car is in the garage or parked nearby.

Rockford Corp. is currently shipping a device intended for this application, and more products are expected by year's end from car audio makers and PC networking companies. The Rockford Omnifi DMP1 (\$600 street) is a trunk-mounted 20GB jukebox that links to your car audio system. It has USB 2.0 and 802.11b connections, along with a small synchronization applet for your PC. USB is for the initial transfer, and Wi-Fi is for daily updates.

"Every night at a predetermined time, Omnifi wakes up and gets the latest music and news," says Craig Janik, CTO of Simple Devices, which provides the software for the DMP1. In addition to transferring new MP3 and WMA music on your



PC, it can also download audio newsfeeds and stock quotes from the Internet.

Other companies working on competing products say online music services could automatically send secure digital music (probably in WMA format) for trial listening. But Egil Juliusen, principal analyst for Telematics Research Group, warns that "the auto manufacturers are conservative and are not likely to do much until the aftermarket suppliers prove there is a market."

As is true with gas mileage, this emerging market's early results may vary.—Bill Howard

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COMING ATTRACTIONS

Canon Revamps Consumer DV Line

Canon is refreshing its popular **ZR Series** of digital video camcorders. New to the family are high-end features from the company's prosumer Optura line, such as still-image capture, Night Mode (infrared-assisted shooting), and SD card slots on some models. On all ZR models, Canon has made often-used functions accessible via buttons, rather than burying them in on-screen menu systems, as on some cameras.—*Jamie M. Bsales*
 ZR 80, \$399 list; ZR 85, \$499; ZR 90, \$599. Canon USA Inc., www.canonusa.com.



Fujitsu's Notebook Heavyweight

Desktop replacement notebooks continue to attract buyers, and PC makers are happy to supply them. The latest entry is the 10.3-pound **Fujitsu LifeBook N5000**. Built around the Intel Pentium 4 processor (up to 3.0 GHz) with Hyper-Threading and the ATI Mobility Radeon 9600 graphics engine, the N5000 promises to be as fast as many desktop PCs. But the real centerpiece is the high-resolution 16-inch Crystal View display, which delivers a class-leading contrast ratio (600:1) and brightness rivaling that of a desktop LCD monitor.—*JMB*
 \$1,699 direct and up. Fujitsu PC Corp., www.us.fujitsu.com/computers.

Corel Readies Graphics Suite

CorelDraw Graphics Suite 12

12 is the latest iteration of Corel's long-running graphics mainstay. Aimed at both professional designers and business users alike, the suite includes CorelDraw 12, Corel Photo-Paint 12, Corel R.A.V.E. 3, CorelTrace 12, and Corel Capture 12. All the apps in the suite offer new time-saving enhancements and improved file compatibility to help streamline your workflow.—*JMB*
 \$399 direct. Corel Corp., www.corel.com.



The Next Move For PageMaker

With the recent release of Adobe InDesign CS, Adobe has announced that it will still sell and support—but no longer upgrade—its PageMaker 7 desktop publishing program. For users who want to migrate to the more powerful app, the company is offering **Adobe InDesign CS PageMaker Edition**. The special release of InDesign includes plugins to mimic popular PageMaker features, conversion and training materials, and templates by well-known designers to help jump-start projects.—*JMB*
 \$699 direct. Adobe Systems Inc., www.adobe.com.



New Linux Desktop Environment

Xandros Desktop OS 2 Deluxe offers would-be Linux users easy installation, drag-and-drop CD burning, and the ability to run Microsoft Office and other Windows programs.—*JMB*

\$89 direct. Xandros Inc., www.xandros.com.

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- 30 Plector PX-708UF
- 32 Sony DRU-530A Dual RW Drive
- 32 TDK 8X Indi DVD Multiformat Burner



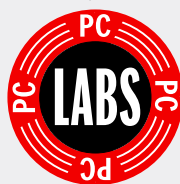
- 35 ConceptDraw V Professional
- 35 Microsoft Office Visio 2003 Professional
- 36 SmartDraw 6.2 Professional Plus



Family-Room Toys for Grown-Ups

BY BILL HOWARD, LOYD CASE, JAMIE BSALES, BRUCE BROWN, AND CRAIG ELLISON

THE MAGAZINE
WORLD'S LARGEST
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Savvy buyers know that the best time to shop for consumer electronics is January and February, when the holidays are over and retailers are desperate to give shoppers a good reason to come out in the cold. • Well, equipment makers are doing their share to get buyers motivated, releasing a spate of products that are worth checking out if you need a plaything.

Here we review two media-centric computers (from ASUS and Gateway) that look more like stereo components than PCs, an SMC wireless media receiver, as well as two set-top recorders (from Gateway and TiVo) that help ensure you won't miss a minute of *Survivor: All-Stars*.

ASUS DigiMatrix media PC

The chassis of the ASUS DigiMatrix Media PC looks like a stereo receiver, and the interface

it displays on your TV resembles that of a Windows XP Media Center Edition PC. But the DigiMatrix is neither.

Instead, it's what the company calls a "digital entertainment PC" that plays CDs and DVDs, tunes TV and radio, records and time-shifts TV, and displays photos and videos. Available through ASUS resellers (who are free to complete and customize the base unit), DigiMatrix is a laudable attempt to compete with Media Center, though there are a couple of rough edges.

The satin-chrome and gloss-black chassis looks inviting and uncomplicated and is easily one of the most attractive media-centric PCs we've seen. The uncluttered front of the 2.1-by-11.2-by-11.4-inch (HWD) box has a big volume knob, a power button, and five CD/DVD transport buttons. When you open the drop-down front panel, the PC underpinnings become clearer. There's a slimline DVD/CD-RW drive, a FireWire port, four USB 2.0 ports,

and four flash card sockets (CF, Memory Stick, SD/MMC, and SmartMedia) in addition to the headphone, microphone, and optical digital jacks that you might find on any AV device.

Again, this is not a Media Center Edition PC. Instead, ASUS bundles its own media player software for use alongside the standard Windows XP OS. Like Media Center Edition (or Dell's Media Experience), the multimedia interface is easy to see from across the room and easy to control with the included remote. Output can be displayed on a PC monitor, TV, or high-definition TV up through 1080i.

The neatest feature is Audio DJ, an ASUS utility that lets you use the system to play the radio, an audio CD, or MP3 files on CD or the hard drive without booting

The DigiMatrix's interface resembles that of Media Center Edition, but the hardware and software are ASUS's own design.



LOOKS

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- 40 Creative Sound Blaster Audigy 2 ZS Platinum Pro
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- 41 QuickBooks Customer Manager



- 42 Microsoft Windows Rights Management Services 1.0
- 42 MobiTV
- 43 NetSuite 9.1

WHAT THE RATINGS MEAN

- EXCELLENT
- VERY GOOD
- GOOD
- FAIR
- POOR

the operating system. All in all, the audio-management photo-viewing features are top-notch and a close match for those of a Media Center Edition PC.

That said, the TV/PVR (personal video recorder) functions trail those of TiVo and the best current Media Center Edition PCs. That's because TV image quality from the tuner is a bit soft, which means that the recordings you make are low-quality, as well. In short, you will be disappointed with the DigiMatrix as your primary TV tuner.

Our test unit could fairly be called DigiMatrix Unloaded. Think of it as a kit PC, since ASUS (known for its motherboards and components) offers a bare-bones system (\$425 street) that requires you to purchase and add the operating system and some internal components—most notably a CPU and hard drive. Most buyers will want to go to an ASUS integrator (such as Howard Computers, www.howardcomputers.com) for a fully configured DigiMatrix (\$1,284 direct and up).

Whichever way you go, beware a few quirks. ASUS says the DigiMatrix runs at a whisper-quiet 30 decibels, but we were always aware of the hum of the twin fans. Lettering for the front-panel buttons is small and barely legible, and the user manuals feel overly technical in places and run long; the quick-setup guide goes on for 22 pages. And most of the audio and video connectors require proprietary cables (supplied) that morph from a single round plug into a half-dozen separate cables.

Another quirk, albeit with upside, is the built-in triple Ethernet: 802.11b wireless, 10/100-

Mbps wired Ethernet, and a separate 1-Gbps Ethernet jack. This allows you to use the DigiMatrix as a wireless access point, miniature server, and two-port Ethernet hub.

If you're a do-it-yourselfer with a spare hard drive and processor looking for new life, the DigiMatrix is an intriguing choice. But if you want a family-room PC that's plug-and-play, the fully configured prices for a DigiMatrix make it tough to recommend over a Media Center Edition PC, given the shortcomings in the TV/PVR part of the equation.

ASUS DigiMatrix Media PC

With ASUS P45Q motherboard, SiS 651/962L chipsets, SiS 315 graphics, DVD/CD-RW drive, TV tuner, 478-pin CPU socket with 533-MHz front-side bus (accepts Celeron or Pentium 4 processor, not included), \$425 street. ASUS Computer International, <http://usa.asus.com>. ●●●●

Gateway Media Center FMC-901X

When Gateway first announced the Media Center FMC-901 family, we were intrigued.

Unlike Gateway's previous Media Center Edition PCs, which were generally housed in chassis scrounged from the PC parts bin, this model looks like a piece of gear you'd put in your AV rack. On top of that, Gateway has integrated a next-generation Hauppauge TV tuner and an ATI Radeon 9800 Pro 3-D accelerator in the higher-end, FMC-901X variant we tested. It all adds up the first Media Center Edition PC that actually looks at home in a family room.

The AV-component look of the FMC-901X is helped by the flip-down panel on the front, which hides many of the more

PC-centric controls and ports: FireWire port, two USB 2.0 jacks, and slots for Compact Flash, SD, Memory Stick, and Smart Media memory cards.

Below the flip-down panel are audio and DVD playback controls, as well as buttons that call up the primary Media Center Edition functions (My Videos, My TV, My Music, My Photos).

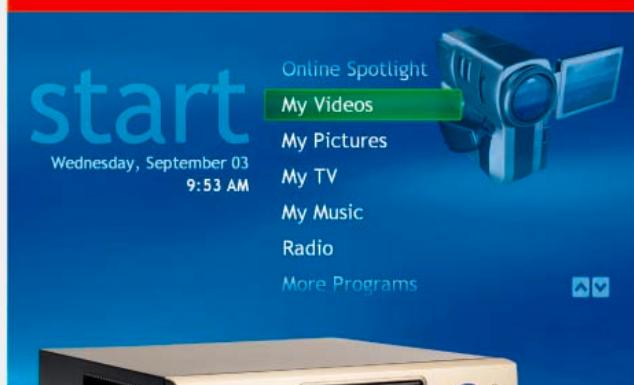
Gateway has added even more I/O to the back of the system, including two more FireWire ports, two more USB 2.0 connectors, and a 10/100 Ethernet connection. A pair of optical connectors offers digital audio output and inputs.

The bundle includes the familiar Media Center Edition remote control as well as a Gyraton Ultra GT wireless mouse and keyboard combination. The Gyraton mouse works well enough for 3-D games, provided that you use it on a surface with a mouse pad, but it's not quite as easy as a dedicated desktop mouse for gaming. And the compact keyboard takes some getting used to. But all in all, it's a very neat package for most things you'd do with a living-room PC.

Unlike the ASUS DigiMatrix, this Gateway unit is a true Media Center Edition PC (see First Looks, November 25, 2003, page 32 for our review of that OS). That means music- and photo-playback features are excellent, and the PVR functions are a close match for a dedicated TV recorder. Burning your favorite shows to either DVD "plus" or "dash" media via the dual-format recorder is incredibly easy.

Best of all, TV quality using the Hauppauge

This Gateway living-room PC combines the fine Media Center Edition functionality with a handsomely designed chassis.



TV tuner card is substantially better than in previous Media Center Edition PCs and rivals that of the Sony VAIO Digital Studio PCV-RZ46G we praised last issue (First Looks, February 3). In fact, quality was good enough that you could spot deficiencies in the source material on some highly compressed satellite feeds.

While the system looks good in our AV rack, there is some noticeable fan noise. It's no louder than some TiVo-based recorders we've tested—and not bad considering the 3.0-GHz Pentium 4 and Radeon 9800 Pro inside—but you could hear it during quiet passages while watching TV or DVD movies.

Oddly, Gateway doesn't supply any of the native Audigy 2 software to go with the Creative Labs sound card, nor the jacks for connecting six analog channels from the Audigy 2 to our AV receiver. So even though the Audigy 2 can support DVD-Audio (DVD-A) playback, you can't do it with the FMC-901X.

Another oversight: No component video cable or dongle for the ATI Radeon 9800 Pro is shipped inside the box. So if your display device lacks a VGA or DVI input, you'll either need to get a converter or order a component video dongle from ATI.

All in all, the Gateway FMC-901X is a far cry from the original family-room PC, the Gateway Destination. Its sleek looks and high degree of usability make it an appealing choice if you want the features of a Media Center Edition PC but don't want something that looks like a PC in your entertainment center.

Gateway Media Center FMC-901X

With 3.0-GHz Pentium 4, 512MB DDR SDRAM, 250GB hard drive, DVD+RW/-RW drive, ATI Radeon 9800 Pro graphics, \$1,799 direct. Gateway Inc., www.gateway.com. ●●●●●

Gateway AR-230 DVD Recorder

If you thought Gateway was only half serious about morphing from a computer company into a

consumer electronics provider, take a look at the Gateway AR-230 DVD Recorder. Like the company's successful plasma TV offering before it, the AR-230 is all about the family room, with nary a PC cable in sight.

Aside from the brand name on the metallic champagne faceplate, what makes this unit notable is the price: \$349 direct (not counting the \$50 mail-in rebate), which makes the AR-230 just about the lowest-priced progressive-scan player plus recorder you'll find right now. Best of all, the AR-230 was simple to set up and straightforward to use.

The bundle has everything you need to get started, including a remote control, coax cable,

Disc Tools button), but a step most users won't know about.

Once we got that figured out, the AR-230 performed flawlessly. The recorder's front-mounted analog and FireWire video inputs make transferring video from your camcorder especially easy. We hooked up a five-year-old Sharp ViewCam and transferred a stack of analog 8-mm tapes to Verbatim DVD+R media.

Unlike most PC-based products (such as the HP DVD Movie Writer DC3000), which require analog video to be captured and encoded, then burned, the AR-230 performs both operations on the fly. That means transferring footage requires no longer than the time it takes for your cam-

manually; the AR-230 doesn't have that feature.

Naturally, you can also use the AR-230 as you would a traditional VCR to record television programming. Hitting the Timer button on the remote brings up an easy-to-navigate menu on the bottom half of your TV screen where you enter frequency, start and end times, and so on. That bottom menu also shows the five recording instances you currently have programmed, which makes programming the AR-230 much more TiVo-like than most VCRs. The top portion of the TimerRecord screen has a video window that shows what's playing on the channel



The convenient front-mounted FireWire and analog video inputs make transferring tapes to the Gateway AR-230 a snap.

gold-plated component video cables, and one piece of DVD+RW media.

The AR-230 can write to DVD+R and +RW blanks, and it can read these as well as DVD-Video titles (of course), DVD-R and -RW media, Video CDs, audio CDs, and CD-R and -RW discs. Unlike other DVD players, it doesn't support DVD-Audio discs or Photo CDs.

If you've ever hooked up a VCR, you'll have no trouble connecting the AR-230 to your TV and home theater system. The clear, comprehensive user guide is well-thought-out and covers all the bases, including a helpful good/better/best explanation of the three video-input choices (composite, S-Video, component) the unit accepts. We did notice one oversight—and a doozy at that—which prompted a call to tech support: If you want to create DVD+R discs that can be read in other set-top DVD players, you have to finalize the disc. It's an easy operation (accessible via the remote control's

recorder to feed it into the recorder. A handy bar at the top of the screen (which doesn't show up on you final recording) shows the transfer time elapsed as well as the total amount of video the disc can hold (based on the quality setting you picked), so you can monitor the process while doing other things.

But there is a trade-off for the time savings. When capturing video, the recorder sets random chapter points every 5 minutes by default (you can change this value in the Settings menu). So to find a certain scene on a home-made disc, you'll need to skip through it in incrementally. On a PC with DVD-authoring software, of course, you have the ability to set chapter points at scene changes, where they make sense. We've also seen other set-top recorders that let you click a button on the remote during transfer to set chapter points

you've selected to record—a nice touch when you can't remember

if HGTV is channel 30 or 31. You can fit up to 6 hours of recorded video on a disc, but that setting is best left to a week's worth of soaps where the video quality—akin to SLP on a VHS tape—doesn't matter much. You can also choose to fit 4 or 2 hours on a disc. For our home movies, we chose the HQ setting. That setting fit only 1 hour of video on each disc, but the quality was as good as the source material.

The Gateway AR-230 DVD Recorder is a fine value. If you have a library of fading analog tapes but don't have the time or inclination to tackle transferring them to DVD via a PC, this is the way to go. And if it's time for a new VCR, the low price of the AR-230 should convince you to switch to DVD.

Gateway AR-230 DVD Recorder

Direct price: \$349. Gateway Inc., www.gateway.com. ●●●●●

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**SMC EZ-Stream
Universal Wireless
Multimedia Receiver
SMCWMR-AG**

Last year brought a torrent of digital media receivers—units that take music, photo, and video content stored on your PC and play it back on your stereo and TV—and 2004 promises to bring even more. One of our favorites is SMC Network's EZ-Stream Universal Wireless Multimedia Receiver (model SMCWMR-AG), which takes several giant steps in advancing digital media hubs.

The EZ-Stream can play audio and video files stored on your PC, using a convenient interface displayed on your TV. It can also run a slide show of your digital images and stream Internet radio from your PC to your stereo system. You can connect the EZ-Stream to your network via wired Ethernet, but it also goes beyond much of the current competition by supporting the three hot wireless network modes: 802.11b, 802.11a, and 802.11g.

The unit sits vertically on an included base and measures 6.4 by 2.7 by 6.4 inches (HWD). The small remote control worked well, although we found we had to be sure to aim it reasonably carefully at the unit. Installation took about 4 minutes, not counting a firmware upgrade that the device found during registration and, at our option, automatically downloaded and installed.

You have to pair the EZ-Stream with a single host PC that stores your image, audio, and video files. That PC also runs the EZ-Stream Universal Media Server application that you use to select folders to share and to configure Internet radio stations. You can also set the software to update the content daily

for quicker access. You can configure the unit via your PC or by using the remote control and a setup interface displayed on a connected TV. The former method is easier if you have to type much, since with the latter you'll find yourself picking letters and numbers one by one with the remote.

The playback controls for each media type are useful but not exhaustive. For example, you can select audio by artist, genre, and playlists, and you can select from sequential, random, and repeat play modes. You also can change the order and pacing of a slide show.

Unlike the Linksys Wireless-B Media Adapter, which has both RCA AV jacks plus an S-Video port, the EZ-Stream has only RCA jacks, for a slight downgrade in video quality. Otherwise the EZ-Stream's greater wireless support (the Linksys device is 802.11b only) and its added media capability (the Linksys product doesn't support video or Internet radio) deliver more bang for the buck.

All told, versatile entertainment support, ease of use, and flexible network connections at a competitive price make the EZ-Stream a great buy.

**SMC EZ-Stream Universal
Wireless Multimedia Receiver
SMCWMR-AG**

Street price: \$250. Requires: Host PC with 400-MHz or faster CPU; 128MB RAM; Microsoft Windows 98 SE, Me, 2000, or XP; broadband Internet connection; wired or wireless network adapter. SMC Networks Inc., www.smc.com. ●●●●●

TiVo Series 2

For many people, TiVo is synonymous with personal video recorders. In fact, TiVo has entered the American lexicon as a

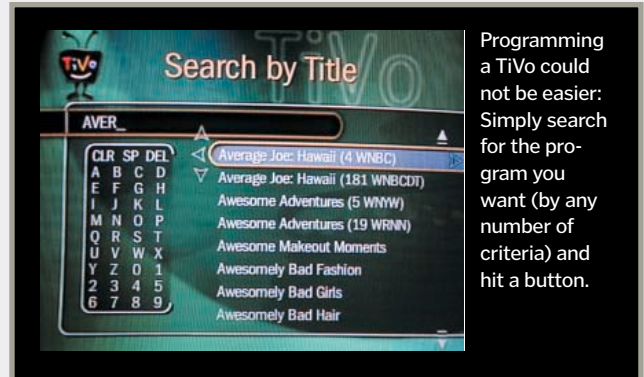
verb, as in "Did you TiVo that last night?" But for all the mind-share the platform has gained, relatively few households actually have a TiVo or similar device.

That's a shame, because true to its marketing hype, TiVo may indeed change how you watch live TV. For example, if your viewing is interrupted, a 30-minute buffer lets you "pause" the show and pick it up later from the point you left. You can also rewind broadcasts and perform quick instant replays.

For this review, we looked at the TiVo Series 2 DVR, which records up to 80 hours of programming. The number of hours of recording capacity depends

hours, and you can't continue your setup until your account is active. The initial configuration must be done via modem: Two phone calls, totaling about 35 minutes, are needed to download the local dial-up phone numbers and programming data. It then takes the TiVo 4 to 8 hours to index. The unit will "call home" daily for schedule updates. You can retrieve updates via your home network, but you'll need to purchase an Ethernet adapter, since the TiVo does not have built-in Ethernet.

Once it's up and running, the real magic of TiVo is the number of recording options available to you. You can record from the



Programming a TiVo could not be easier: Simply search for the program you want (by any number of criteria) and hit a button.

on the quality level you choose. The highest quality level consumes three times the disk space as basic quality. We found that medium quality, which reduces your 80 hours to 40, produced acceptable quality for programming that you'd view once and discard. Of course, you have an option of saving stored programs out to a connected VHS or DVD recorder.

An excellent manual guides you through the initial hookup of your TiVo, and on-screen menus guide you through configuration. The installation is very straightforward, but don't expect to be fully functional an hour after you open the box. Early in the configuration process, you are prompted to activate your subscription to the TiVo service (\$12.95 a month or \$299 for the life of the product).

Unfortunately, activation of your account can take at least 2

program guide, search by genre (Drama, Comedy, Sports, and so on) or search by the name of the show. The Wishlist feature lets you search and record by actor or director.

With a couple of clicks of the remote, you can set TiVo to record, say, the entire season of West Wing without duplicates. You can also specify how long to keep programs, or let TiVo delete them when it needs more room. Best of all, you select your recorded programs for playback from a menu, so there's no fumbling with unmarked video tapes.

For TV junkies, a TiVo or similar device is a must. And if you just want to record TV and don't want the expense or complexity of a Media Center Edition PC, a TiVo is the way to go.

TiVo Series 2

Street price: \$350, plus \$12.95 a month subscription fee. TiVo Inc., www.tivo.com. ●●●●●



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Burning at the Speed of Light

BY DON LABRIOLA

Even after more than half a decade of relentless innovation, DVD writers continue to advance at a break-neck pace. Where once creating a full 4.7GB DVD disc took more than 30 minutes, the new crop of 8X DVD+R drives can do it in about 8 minutes.

And while the four models we tested for this story represent the best the industry has ever had to offer, even more advanced burners are just around the corner. Dual-format models that can record both +R and -R media at 8X speeds are expected to ship soon (the models here drop to 4X speed for DVD-R media), and 12X units should hit the market by midyear. Another big shift: Recorders that support dual-layer DVD+R media—which nearly doubles the 4.7GB capacity of today's discs—are already being demonstrated.

Some buyers may prefer to wait for these new technologies before making a purchase, but given the plummeting prices of today's 8X DVD writers (now as low as \$200), simply buying the current state of the art can make just as much sense. If you want stable, cost-effective technology that's already on the shelves, you'll find the latest generation of 8X drives tough to beat.

HP DVD WRITER DVD400i

The HP DVD Writer DVD400i is a robust offering that just six months ago would have garnered top honors. Though not our first choice in this roundup, it suffers only in comparison to even more impressive competition.

The DVD400i was generally slower on our speed tests but not alarmingly so, typically trailing by just a few seconds. And the DVD400i excelled in most other ways. Installation was a snap, thanks to clearly written



The Plextor entry (left) is our favorite external DVD burner. The HP drive is among lowest priced.

documentation and a smart animated setup utility that automatically figures out the best way to configure the drive in your system.

A generous software bundle includes the Sonic RecordNow! disc-mastering application, the ArcSoft ShowBiz 2 video-authoring package, and Sonic's Simple Backup data backup program. You also get the CyberLink Pow-

erDVD media player and muvee autoProducer, a unique application that intelligently mixes sound and video clips into effects-laden music videos. Our evaluation unit lacked packet-writing software, which forced us to use our own copy of Sonic DLA 4.5 to run our +RW benchmark tests, but HP plans to have DLA 4.6 available to registered DVD400i owners as a free down-

load by the time you read this.

Unlike the other drives we reviewed, the DVD400i is unable to burn DVD-R and DVD-RW media. We don't consider this a deal breaker because most DVD players sold today handle "plus" and "dash" formats equally well. If you prefer to own a dual-format model, this isn't the drive for you, but it should be an acceptable choice for almost anyone else.

How We Tested

For our first test, we measured the time each drive took to rip the content of a 1GB unencrypted DVD-Video disc to a hard drive image. We then timed how long it took to burn that image onto write-once media (8X DVD+R and 4X DVD-R, where supported), since these types of media are what most users would choose for archiving video content.

To test each drive's packet-writing performance with rewritable media (the typical choice for shuttling data between machines), we dragged and dropped a 1GB folder from our hard drive to 4X DVD+RW and 2X DVD-RW media (where supported). For our final test, we timed how long each drive took to back up a 170MB folder to CD-R media.

Our test-bed consisted of 2.53-GHz P4-based MPC systems, each configured with 512MB of PC2100 RAM, a 40GB 7,200-rpm hard drive, and Windows XP Professional. We used the software applications bundled with each drive to perform these tests. We burned to Verbatim discs because of their reputation for consistent quality. Despite reports that some older players have trouble recognizing 8X media, every disc we created played without incident in the PC DVD-ROM drives and set-top DVD players we use for compatibility testing.

HP DVD Writer DVD400i

Street price: \$200. Hewlett-Packard Co., www.hpshopping.com. ●●●●●

PLEXTOR PX-708UF



The Plextor PX-708UF is the only external drive we tested, but both its FireWire and USB 2.0 interfaces deliver performance in a class with that of any internal IDE model. It was also the only drive reviewed here capable of successfully recording relatively inexpensive Verbatim 4X DVD+R media at 8X speeds, a feat that Plextor claims is consistently possible only with certain brands of media.

Our evaluation unit practically installed itself, allowing us to begin burning discs less than 20 minutes after opening the box. The comprehensive software bundle is built around Roxio's extensive Digital Media Suite,

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The Cisco Systems logo, featuring the text "CISCO SYSTEMS" above a stylized bridge graphic.



The TDK 8X DVD burner (left) distinguishes itself from the crowd. The Sony model is well-priced and well-equipped.

which includes disc authoring, mastering, labeling, and recording applications; DVD-player software; a MusicMatch-like audio jukebox; a photo-editing package; and Roxio's easy-to-use new Drag-to-Disc packet-writing utility. Rounding out the package are FireWire and USB 2.0 cables, a fully indexed printed manual, and a copy of Roxio's popular Toast disc-mastering application for the Macintosh.

The PX-708UF boasts an array of more advanced features that include a hardware self-test mode, the ability to adjust laser power and writing speed automatically to compensate for variations in media, a pair of analog audio output jacks, and user-upgradable firmware. The drive also lets you manually adjust laser power when recording CDs to resolve CD player-specific incompatibilities.

The Plextor PX-708UF may be the most expensive drive in this roundup, but it's worth every penny. It offers an outstanding combination of performance, portability, rock-solid construction, functionality, and ease of use.

Plextor PX-708UF
\$300 street. Plextor, www.plextor.com. ●●●●●

SONY DRU-530A DUAL RW DRIVE

The Sony DRU-530A is a class act. Boasting competitive performance, top-notch setup tools, and a low price, it's a

well-designed product with no major flaws.

Installing our test unit and learning to use its bundled software was a snap. Sony's profusely illustrated setup poster and task-oriented quick-start application clearly explain how to configure the drive hardware and perform common tasks in each application. If you run into a snag or simply need more help to get started, the Setup CD includes well-written user guides and links to each hardware and software vendor's support site.

Like the HP DVD400i, the DRU-530A ships with Sonic RecordNow! and CyberLink PowerDVD. But that's where the similarity ends. The rest of the bundle consists of Sonic's DLA 4.5, plus a freeware version of MusicMatch Jukebox 7.5, and the disc-authoring/mastering module of Sonic MyDVD Studio Deluxe 5 suite. MyDVD has a solid selection of video-capture and disc-burning features but offers only rudimentary video-editing functions not in a class with those of the ShowBiz 2

application bundled with the HP drive.

The DRU-530A did well on our performance tests, generally falling right in line with the Plextor and TDK models and outperforming the HP DVD400i. Its 40X CD-R recording speed was a big improvement over the 24X capabilities of prior Sony models.

After shepherding its users through four generations of dual-format DVD rewriters, it's no surprise that Sony has gotten almost everything right this time around. Despite a few minor caveats, the DRU-530A is a very good value.

Sony DRU-530A Dual RW Drive
\$220 street. Sony Electronics Inc., www.sony.com/dvdburners. ●●●●●

TDK 8X INDI DVD MULTIFORMAT BURNER

The TDK 8x Indi's solid performance and ultra-quiet 45dB noise levels are by themselves more than enough to earn it praise. But when you factor in TDK's liberal 24/7 technical support policies,

flashy animated installation aids, robust software bundle, and outstanding documentation, the Indi begins to look like a truly formidable contender. If you're looking for an internal burner, you won't find better.

Like the Plextor PX-708UF, the Indi ships with an array of Roxio applications that include the entire Easy CD & DVD Creator 6.1 suite, Drag-to-Disc, the PhotoSuite Lite image editor, and the DVDMax video player, all of which can be accessed through an integrated one-click TDK Launcher utility.

In addition to an Easy Install poster, the 8X Indi ships with a clever 64-page flipbook-style manual that contains a pair of well-written hardware and software guides printed back to back. The drive's bundled software CD adds Adobe Acrobat transcriptions of each guide, full hardware specifications, and a multimedia version of the Easy Install poster that features a computerized voice reading instructions over Flash animations of each illustration.

If all this isn't enough, TDK also provides registered users with 24/7 toll-free live telephone support (a rarity in the industry) and a well-stocked Web site filled with software downloads, FAQs, firmware upgrades, skins, product documentation, and a terrific live chat facility hosted by TDK support personnel.

Despite grueling competition, TDK has done a fine job of creating a product that distinguishes itself from the crowd. The 8X Indi gave us a lot to like.

TDK 8X Indi DVD Multiformat Burner
Street price: \$250. TDK Corp., www.tdk.com. ●●●●●

PERFORMANCE TESTS: 8X DVD RECORDERS						
All scores are in minutes:seconds. Low scores are best. Bold type denotes first place.						
	Rip 1GB DVD-Video image to hard drive	Burn 1GB DVD-Video image	Drag 1GB folder to DVD (packet writing)	Back up 170MB folder to CD-R		
Format ▶	8X DVD+R	4X DVD-R	4X DVD+RW	2X DVD-RW	CD-R	
HP DVD Writer DVD400i	4:01	3:46	N/A	4:46	N/A	1:36
Plextor PX-708UF	3:56	3:14	5:38	4:35	8:46	1:39
Sony DRU-530A Dual RW Drive	3:49	3:50	5:34	4:32	8:38	1:34
TDK 8X Indi DVD Multiformat Burner	3:56	3:14	5:22	4:30	8:51	1:33

RED denotes Editors' Choice. N/A—Not applicable: The drive does not support this type of media.

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New Diagramming Tools Target Visio

BY M. DAVID STONE

Mention a diagramming program for creating anything from organization charts and maps to room designs and the first program that comes to mind is Microsoft Office Visio. But Visio isn't the only diagramming program out there, and it's facing competition from some lower-priced alternatives.

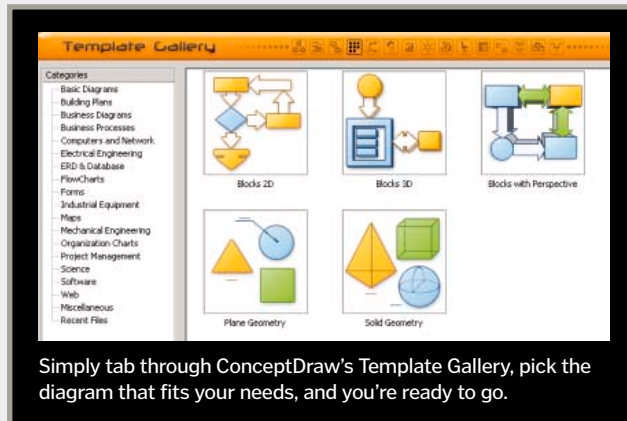
To see how they stack up, we tested CS Odessa Corp.'s ConceptDraw V Professional and SmartDraw.com's SmartDraw 6.2 Professional Plus and put them up against the latest Microsoft offering, Microsoft Office Visio 2003 Professional. Our conclusion: Visio is still the champ, thanks to its intuitive workflow and collaboration features. But for users who don't need the workgroup features, ConceptDraw is an affordable alternative.

CONCEPTDRAW V PROFESSIONAL

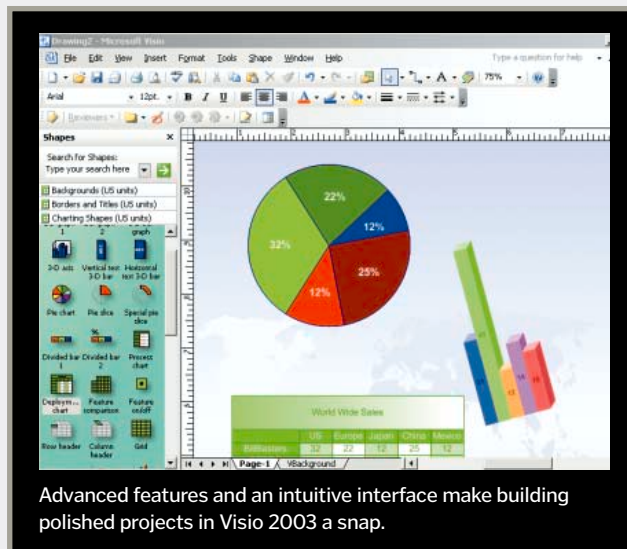
ConceptDraw V is available in two versions. The Standard edition (\$149 direct), targeted at business users, has templates for features like flowcharts, business diagrams, organization charts, and office and home layouts. The Professional edition that we tested (\$349) is meant for technical users and adds templates for such areas as project management, Web design, and electrical engineering.

ConceptDraw has a polished look and feel that's similar in many ways to Visio. By default, the interface shows the Template Gallery, with a list of template categories. You can select each of the categories in turn to see examples for that category. When you see one that seems appropriate for the diagram you want to create, simply double-click on it to open the appropriate template.

The working screen is divided into multiple panes. On the left is a narrow pane with a list of buttons showing the currently open templates. Click on a button and



Simply tab through ConceptDraw's Template Gallery, pick the diagram that fits your needs, and you're ready to go.



Advanced features and an intuitive interface make building polished projects in Visio 2003 a snap.

the shapes for that template are shown below it. You can then drag a shape over to the drawing area on the right. As you assemble the diagram, you can position each shape, resize it, and add text and connectors as needed. Connectors stay connected as you move objects, stretching, shrinking, rotating, and moving as needed. You can also use any object as a connector.

Version V adds the ability to use an unlimited number of layers, and it adds anti-aliasing to give a more professional look to angled lines. The documentation claims that the app supports XML for Visio. But we couldn't get it to import a Visio 2003 file on our tests, and the export feature has yet to be added.

The company says there are some known bugs in the import feature that should be fixed by the time you read this. The export feature will be added as a free upgrade shortly afterwards.

What you won't find in ConceptDraw is anything to match the sophisticated collaboration tools in the latest version of Visio. If you're less concerned with collaboration than with diagramming, however, ConceptDraw can provide all the features you need, at a lower price than Visio.

ConceptDraw V Professional

Direct price: \$349; Standard edition, \$149. Requires: 128MB RAM; 150MB hard drive space; Microsoft Windows 98, Me, 2000, or XP; or Mac OS 10.1.5 or later. CS Odessa Corp., www.conceptdraw.com. ●●●●●

MICROSOFT OFFICE VISIO 2003 PROFESSIONAL



Microsoft Office Visio 2003 is the second release of the program since Microsoft bought Visio four years ago.

Like the first Microsoft-developed version (Visio 2002), it's available in two editions. The Standard edition (\$199 direct) is for general business users and comes with shapes for flowcharts, organization charts, project schedules, maps, and the like. The Professional edition (\$499) adds shapes for Web sites as well as for electrical, mechanical, and process engineering.

Visio 2002 added interface changes to make it act more like Office, and Visio 2003 ties even more tightly into the Office family. Some changes consist of features that are new for Office 2003 in general. For example, Visio 2003 can take advantage of Microsoft SharePoint site integration for collaborating on documents via document workspaces.

Another plus for collaboration: Visio 2003 also contains a Track Markup feature and a Review mode that are similar in concept to Track Changes in Word. You can use it to let others add comments and suggest additions without affecting the original document. You can then review the changes before accepting or rejecting each one.

The mechanics of using Visio 2003 are essentially identical to earlier versions. First, you choose one or more stencils, which the menu command now refers to as *choosing shapes*. The stencil names show as headers in a narrow pane on the left. Click on a header and it expands to show the shapes for the stencil. You can then drag a shape or connector to the drawing area on the right, position it, size it, add text, and so on.

We found using Visio 2003 somewhat easier than working in either ConceptDraw or Smart-

Draw. For example, you can easily turn a shape, such as an arrow with an arrowhead on each side, into a connector simply by dragging each arrowhead to touch a connect point on another shape. Once connected, it will stretch, shrink, and rotate as you move the other shapes around, until and unless you drag it away from the connect points. Neither ConceptDraw nor SmartDraw offers anything as intuitive for connecting shapes.

Moreover, Visio 2003 is the obvious program of choice if your diagrams are group efforts. But even for those who don't need to collaborate, the program offers an elegant interface that makes it more attractive if you don't mind the higher price.

Microsoft Office Visio 2003 Professional

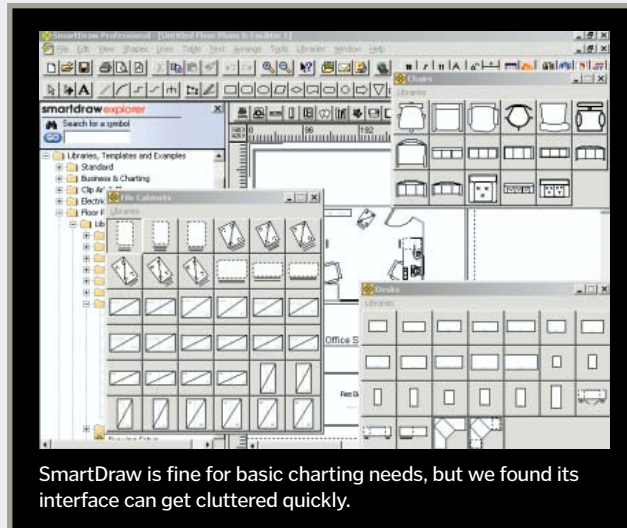
Direct price: \$499; Standard edition, \$199. Requires: 128MB RAM, 210MB hard drive space, Windows 2000 (with Service Pack 3) or XP. Microsoft Corp., www.microsoft.com. ●●●●●

SMARTDRAW 6.2 PROFESSIONAL PLUS

SmartDraw 6.2 Professional Plus is the least expensive of the programs included here. The Standard version (\$69 direct) is meant for basic charts and diagrams. The Professional version (\$129) adds one symbol collection of your choice out of SmartDraw.com's 11 available sets, with choices that include Business and Charting, Electrical Engineering, and Medical and Anatomy. It also offers important features, such as layers, gradient fills, and OLE client support. The Professional Plus version (\$198), which we tested, comes with all 11 symbol collections.

Our first reaction—and our lasting impression—when we loaded SmartDraw was that there is too much on the screen at once. The interface is crowded compared with ConceptDraw or Visio.

Like ConceptDraw and Visio, SmartDraw shows a narrow pane on the left side, with a much larger drawing area to the right. But the similarities end



SmartDraw is fine for basic charting needs, but we found its interface can get cluttered quickly.

there. Instead of letting you choose which libraries and templates to work with and then showing only those items in the left pane, SmartDraw shows a hierarchical list of every item at all times. When you open a library, it opens as a large, floating window over the drawing area. If you need to open several libraries, the drawing area will

be almost entirely covered.

SmartDraw is also less polished than the competition in some important ways. For example, it doesn't include an anti-aliasing feature, so lines on an angle have a ragged look. And many of the objects in the program's libraries and templates are clip art, simply lacking a professional look—a prob-

lem that's only made worse by the aliasing.

This isn't to say that SmartDraw has no redeeming qualities. One nice touch, for example, is what it calls the Microsoft Office Companion, a set of toolbar buttons that will appear if you have Microsoft Office installed. The toolbar takes advantage of the OLE support to put you one click away from inserting objects in your diagrams, which you can create using MS Graph, WordArt, Office ClipArt, Equation Editor, Excel, or Word.

Ultimately, SmartDraw provides an adequate set of tools for creating diagrams. It will let you create diagrams to serve most purposes. But this is a case of getting what you pay for; SmartDraw's low price goes hand in hand with its limitations.

SmartDraw 6.2 Professional Plus

Direct price: \$198; Standard edition, \$69; Professional edition, \$129. Requires: 30MB hard drive space, Microsoft Windows 95 or later. SmartDraw.com, www.smartdraw.com. ●●●●●

Mac on the Go

BY TROY DREIER

Palm OS-based handhelds are the de facto choice of most Mac users, since those models work out-of-the-box with the Mac OS. But the release of **PocketMac 3.0** should have Mac fans taking a hard look at Pocket PC 2003-based or SmartPhone-based models the next time they purchase a handheld.

After you install PocketMac, you'll find a new icon and folder on your Mac desktop. Double-clicking on the icon opens PocketMac's iSync-like control window and puts a small PocketMac icon in your Finder toolbar. From the toolbar icon you can open PocketMac's preferences panel, which lets you specify which files to sync.

By default, PocketMac synchronizes tasks and calendar entries from Entourage or iCal;

contacts from Entourage, iCal, or NowContacts; and mail from Entourage or Mail. It can also sync files, songs, photos, and Web pages. We especially liked its time-saving options, like reducing the size of pictures, omitting graphics from Web pages, and taking only a set amount of days from a calendar.

One of the joys of PocketMac is how well it works with standard Mac applications. During installation, it adds a folder to your default Web browser's bookmark list, where you can save Web pages that you want synced later. It adds similar folders in iPhoto and iTunes, so you can quickly specify files to sync from within those applications. And Mac users who are allergic to anything Windows will love the optional theme, which gives the Pocket PC interface a Mac OS look.

Our only complaint is that setting up e-mail syncing is too complex. We had to be

talked through it by tech support, since the included instructions didn't match the options we saw on the screen. But once we cleared that hurdle, PocketMac generally worked beautifully in our testing. So if you think you've been limited to the Palm platform for your Mac, think again.

PocketMac 3.0

Direct price: \$41.77. Requires: Mac OS X 10.2.6 or later, Pocket PC 2003 or SmartPhone device. Information Appliance Associates, www.pocketmac.net. ●●●●●



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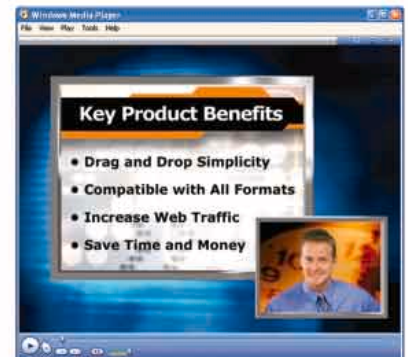
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Getting Ready for 7.1

BY DON LABRIOLA

Depending on whom you talk to, 7.1-channel audio is either the Holy Grail of immersive sound or the answer to a question nobody asked. As is often the case with new technology, the truth is somewhere in between. But one thing is clear: For movie buffs and hard-core gamers sold on this technology, Creative Labs pushes the envelope with its stunning new 7.1-channel sound board and speakers.

A properly configured 5.1-channel system can create a smooth, stable front image, but relying on two channels to generate the rest of the sound field doesn't always result in a seamless audio circle, as front-to-back and rear right-to-left imaging can be tenuous. The 7.1 format addresses these concerns by adding a pair of side channels that help blend front and rear output.

With the **Creative Sound Blaster Audigy 2 ZS Platinum Pro** and **Creative GigaWorks S750**, Creative Labs becomes the first company to complement a 7.1 board with matching speakers. Although almost no discrete 7.1-channel content exists (yet), the Audigy 2 ZS can render EAX-compatible game soundtracks as eight completely independent channels, and it can expand stereo, 5.1, and 6.1 source materials into virtual 7.1 content.

The THX-certified Audigy 2 ZS card boasts an enormous feature set that includes 24-bit, 192-kHz playback and 24-bit, 96-kHz recording capabilities, 6.1-channel Dolby Digital EX and DTS-ES support, DVD-Audio playback, and the ability to record streaming Internet audio on the fly. It also supports Creative's jaw-dropping EAX 4.0 Advanced HD technology, which provides a broad range of digital effects and state-of-the-art game soundtrack-rendering capabilities.

We evaluated the top-of-the-line Platinum Pro version of the

Audigy 2 ZS, which includes music production software from Steinberg and Image Line and a terrific external desktop module—an I/O box packed with analog and digital inputs and outputs, FireWire connectors, and front-mounted volume controls, as well as MIDI, headphone, and microphone jacks. Rounding out the bundle is a full-featured wireless remote.

The unit was surprisingly easy to install, thanks to a ma-

authority we've rarely heard from PC speakers. Each satellite boasts a generous 3.5-inch midrange driver, a 1-inch tweeter, and 70 watts RMS of amplification. The downward-firing ported subwoofer contains a hefty 210-watt amp and an 8-inch cone. With only two satellites and the bass unit engaged, our test system pumped out 103 dB—louder than the roar of a subway car.

The set's bass response is dominated by a broad peak centered around 60 Hz, which results in a bombastic, floor-shak-

sounding low end on well-recorded audio CDs. Nonetheless, many listeners in the target demographic will overlook the system's relatively subtle sonic flaws, given its crystalline high end, spacious sound, and overwhelming volume levels.

Most important, the Audigy 2 ZS/GigaWorks S750 combo proved to us that 7.1-channel audio can enhance the playback of top-notch game soundtracks significantly. During our testing, ActiVision's EAX-compliant Call of Duty and Star Wars Jedi Knight: Jedi Academy produced



The Audigy 2 ZS sound card and GigaWorks S750 speakers make an awesome set.

ture setup utility and streamlined configuration and calibration tools. There's also a nifty new Software Auto-Update feature that—much like Microsoft Windows Update—automatically locates and installs the latest drivers and applications.

Controls are located on both the wireless remote and the desktop module. The desktop component adds a treble adjustment, headphone and mic jacks, an M-Port input (for compatible Creative handheld music players), and upmix settings that map the output of 5.1 and 6.1 sound boards to all seven satellites.

As for the speakers, the GigaWorks S750's oversize bass unit and 700-watt amplifier give it an

ing low end. Like its Creative MegaWorks predecessors, the GigaWorks S750 is also fairly bright, with a steadily rising high end that levels off at around 7 kHz. The system's relatively lean upper bass and lower midrange enhance the apparent detail and imaging and help prevent its potentially overpowering low end from muddying the midrange.

Despite the sparkle and punch it adds to game and movie soundtracks, the GigaWorks S750 is hardly an audiophile system. On default settings, it gets a bit shrill at high volumes and produces so much midbass that we had to drop the subwoofer to the lowest level in order to approximate a natural-

noticeably smoother 3-D panning and rear imaging than with our reference 5.1-channel Creative MegaWorks 510D system. With other types of content, including Dolby Digital EX DVD movies, the improvement was less dramatic but still noticeable.

All told, the Creative GigaWorks S750 is an awesome gaming system and a good choice for desktop theater. And the Audigy 2 ZS is an unqualified winner.

Creative Sound Blaster Audigy 2 ZS Platinum Pro

Direct price: \$249.99. ●●●●●

Creative GigaWorks S750

Direct price: \$499.99. ●●●●●

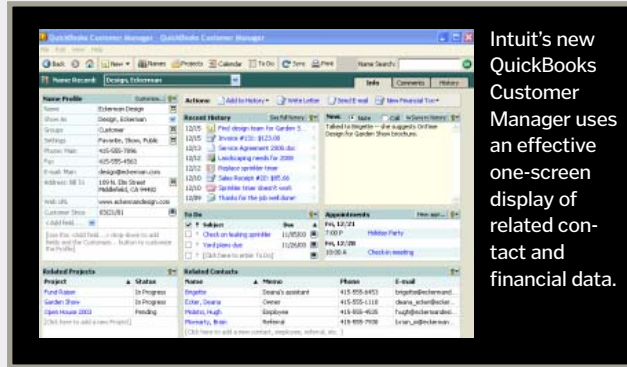
Creative Labs Inc.,
www.soundblaster.com.

Intuit Delivers a New Type of Hybrid

BY KATHY YAKAL

Intuit gives rise to a brand-new software category with its new **QuickBooks Customer Manager**. Populate this innovative product with contacts and data from several popular applications and you get one centralized application that holds your critical customer data. It's an interesting and well-executed concept, though there are some caveats.

The program guides you through bringing in your own database or building one based on QuickBooks data. Customer Manager is built to work with QuickBooks, Quicken, Microsoft Outlook, Outlook Express, Access, and Excel. Quicken, Access, and Excel data comes in as plain text, and Customer Manager provides a field-mapping tool that facilitates smooth



Intuit's new QuickBooks Customer Manager uses an effective one-screen display of related contact and financial data.

importing. You can also import text files from other applications, but they can't be synchronized; they must be reimported every time.

You can display several different list views of your data, sorted by name (a very thorough, customizable contact record), by project (a very skimpy project definer), and by to-do items.

For scheduling, you can use either the calendar format provided or Outlook.

Each contact has its own dashboard-type screen that displays all pertinent information, and you can enter new data on this page. To-do items, notes, appointments, and related contacts are all linked to the open contact. Financial transactions show up

in the Recent History box along with contact-related data.

A built-in tool helps you keep your data in sync. In this first version, the synchronization automatically brings in everything you specify from the originating application, but you can't automatically send changes back. You can send individual records back to QuickBooks via a check box, and there's a workaround for Outlook, but there's no automatic sync for other apps.

This first release of Customer Manager doesn't have the chops to compete with established CRM products. That said, the melding of limited contact management and QuickBooks financial data, combined with an effective one-screen display of that information, provides convenience that some users may be looking for.

QuickBooks Customer Manager

Direct price: \$79.95. Intuit Inc., www.customermanager.com. ●●●●●



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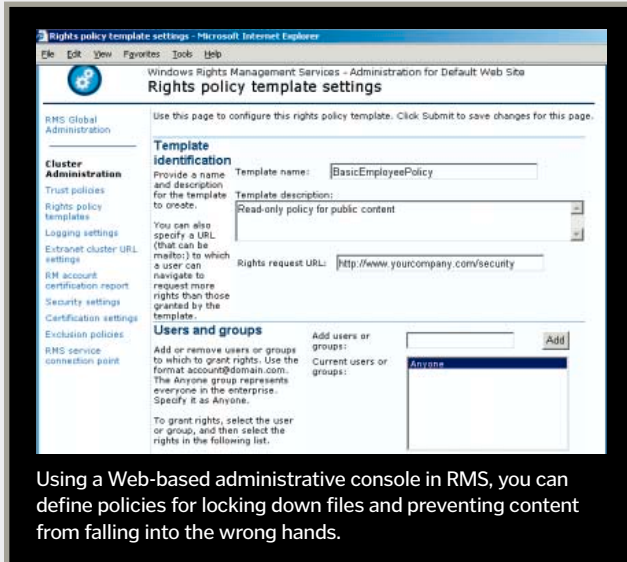
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RMS: Maintain Control of Business Content



Using a Web-based administrative console in RMS, you can define policies for locking down files and preventing content from falling into the wrong hands.

BY RICHARD V. DRAGAN

Aiming to protect corporate intellectual property, **Microsoft Windows Rights Management Services 1.0** delivers a promising security infrastructure for safeguarding your company's documents in both Microsoft Office 2003 and in custom systems built with the freely downloadable RMS SDK. RMS marks a new and important step for better control over corporate data to guard against unauthorized use.

We installed RMS on Windows Server 2003 (the only supported server OS) with SQL Server 2000 as the database. Running the setup wizard for RMS is practically effortless; the real work was needed during the provisioning step, which is not as easy as with other administrative chores in Windows. Getting this right will require an IT manager to brush up on certificate management and overall security issues.

For our test deployment, we defined policies based on Active Directory (AD) users and groups and set various rights to protected content, including whether to allow these users to edit documents or simply view them. We also set permissions for printing docu-

ments and storing files locally.

We found this administrative tool to be very capable. Winning features include options for designating "super-users" who can read all encrypted content, .NET password integration, and a quick way to revoke licenses for older versions of Windows. But there is room for improvement in the wizard.

For example, the tool doesn't let you browse and select AD users visually.

With RMS running on the server, we turned to the client side of the picture. The good news is that Office 2003 is an out-of-the-box RMS client, thanks to its Information Rights Management infrastructure (though to enable IRM, you still need to license the RMS server component). In testing, we were able to lock down Word and Excel documents based on a user's identity. When a file is marked as read-only, common operations such as cutting and pasting to other documents and screen captures are disabled. Even if users forward attachments of encrypted documents into the wrong hands, the files can't be opened without a valid log-on to RMS.

Beyond the Office 2003 support native to RMS, Microsoft offers several custom SDKs for rolling RMS security into custom server- and client-side software. For developers, there are two ways to program with RMS.

First, Microsoft provides several dozen C/C++ unmanaged Windows APIs for controlling content (with functions to obtain licenses and certificates and to encrypt and decrypt data). There is also a SOAP-based API.

Although we found the APIs themselves to be simple enough, programming for security requires a hacker mindset to prevent attacks. Online help and sample code illustrating RMS security will help get you started.

Granted, rights management is not for every organization. Locking down content will make the most sense in industries like law, healthcare, and banking, where ensuring that information stays in the right hands is critical. Overall, for businesses that primarily need to protect Office 2003 documents (or for larger enterprises with adequate developer resources) Microsoft's new RMS tools deliver a promising bulwark against accidental or intentional leakage of corporate IP.

Microsoft Windows Rights Management Services 1.0

Direct price: \$37 per client (\$18,066 for unlimited clients). Microsoft Corp., www.microsoft.com. ●●●●●

Watch TV—On Your Phone

Camera phones, move over: The new killer app for mobile handsets is here. The **MobiTV** service from Idetic delivers decent-quality live TV on select Samsung and Sanyo phones via the Sprint PCS network. At first we were skeptical, but we soon found the service surprisingly effective, appealing, and affordable (just \$9.99 a month on top of the regular Sprint PCS fees).

MobiTV is available via the Download | Applications menu on the supported phones. And while you might expect the first phone TVs to be premium-priced units, some cost under \$100.

The channels MobiTV offers include ABC News Live, California Music Channel, CNBC, College Sports Television, Discovery Channel, Discovery Kids, Independent Music Network, MSNBC, The Learning Channel, and Toon World TV Classics. (Idetic is in negotiations with other channels.) What you get is the same thing you'd see and hear on your television set—not just video clips or selected content, as with other services.

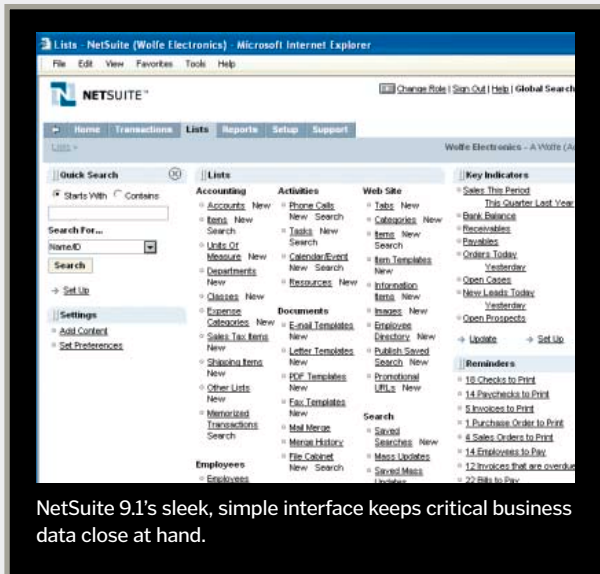
On our tests (using a Samsung SPH-A620 handset), MobiTV took approximately 20 seconds to load, connect, fill the buffer for the default channel (MSNBC), and start playing. When we switched channels, refilling the buffer with the new channel's content took about 6 seconds. The video frame rate hovers at around 1 frame per second—a far cry from wired TV's 30 fps, but still watchable, especially for news and the like. More important, audio quality is very good, with no choppiness or dropouts. —*Bruce Brown*

MobiTV

Direct price: \$9.99 a month (in addition to normal Sprint PCS service fees). Requires: Sprint PCS Vision service, select Samsung and Sanyo phones. Sprint Spectrum LLP, www.sprintpcs.com. ●●●●●



A Satisfying Business Suite



NetSuite 9.1's sleek, simple interface keeps critical business data close at hand.

BY KATHY YAKAL

Going beyond its accounting roots, **NetSuite 9.1** incorporates a very capable small-business accounting product with ERP, CRM, and e-commerce functions.

NetSuite has remained exceedingly easy to use as it's grown; its deceptively sleek, simple interface holds exceptional power and customizability. New features in Version 9.1 include enhancements to the site's Dashboard, better handling of Web site customers and the site itself, a new self-service support center, and more.

NetSuite's list-based layout keeps navigation zippy. Overviews of each section of the site—Home, Transactions, Lists, Reports, Setup, and Support—offer quick lists of their features. Links to all of your setup chores are on one screen; you can import data in several formats, including QuickBooks, Quicken, and XML.

Accounting functions are comprehensive. You can track customers, vendors, payroll, and inventory. Records are exceptionally detailed, as are transaction screens (purchase orders, inventory assembly, expense reports, and so on). A new Inventory feature streamlines data entry for items with multiple options, like colors and sizes. A thorough list of reports provides vital business management information, and this version includes new report options.

NetSuite makes critical enterprise information available in one central location. You can set permissions so that employees, customers, and vendors have access only to their pertinent information. NetSuite also offers tools for building integrated Web sites based on the item records you've already compiled in the accounting application. Data flows back and forth, so your records are always up to date.

This back-office integration also makes NetSuite an effective CRM application. Your sales force can track leads and prospects, manage estimates and orders (with real-time access to inventory), and follow the history and post-sale interactions with customers.

If you need more than accounting, this suite is worth a try.

NetSuite 9.1

Direct price: \$4,800 a year for two users. NetSuite Inc., www.netsuite.com.

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Chapter 18

Converting Tapes to DVD



One of my favorite movie lines is from *It's a Wonderful Life*, the great, great movie with Jimmy Stewart and Donna Reed. George Bailey (Stewart) walks into a bar with Clarence, his guardian angel, sent to teach him his critical life lesson. The bar is a cacophonous joint filled with raucous men and bawdy women, and Clarence starts asking about fruity drinks sans alcohol. Nick, the bartender, leans over and says aggressively “Look, mister, we serve hard drinks in here for men who want to get drunk fast, and we don’t need any characters around to give the joint atmosphere.”

I’ve always thought this was a brilliantly focused marketing statement, identifying target audience and a unique selling proposition in one clear sentence. If only all marketing communications were this crisp and precise.

If you’re reading this chapter, I’ll assume you want to convert analog or DV tapes to DVD fast. You want to set up the computer, press a few buttons, walk away, and return to the finished DVD. No slideshows, no animated buttons, no fruity drinks.

In short, you’re going to convert the tape to DVD with minimum fuss or fanfare. If you’re looking to learn how to create fancy menus and slideshows, jump ahead to Chapter 20.

Recall that in Chapter 4, I discussed factors to consider when purchasing a product to convert tape to DVD, so if you haven’t purchased a product yet, you should start there. Here, I’ll discuss the required hardware and software, and then detail how to convert tapes to DVD with two products: Ulead’s MovieFactory 2 and Sonic’s MyDVD. You’ll get in, get out, get it done, and go have a beer at the local pub.

Cheers.

Note

Any DVD-authoring program can capture and write to disc, but most require your presence during the process. This chapter focuses solely on those products that automate the process.

What You'll Need

In the computer software business, there are lies, darn lies, and minimum system requirements. Ulead says that MovieFactory should run on a Pentium III 450 MHz with 64MB of RAM, but I don't believe it for an instant. In a recent *PC Magazine* review, I tested USB-based hardware encoders on a Pentium III 1 GHz with 128MB of RAM, and not one product reliably produced a DVD; in fact, most failed miserably. So, if you want to convert tapes to DVD quickly and easily, you'll need at least a Pentium 4 computer with 256MB of RAM.

If you're capturing video from an analog source like VHS, you'll need a capture product, internal or external, that can accept analog inputs. If your primary goal is conversion to DVD, your best bet is a USB Analog Capture Device like those described in Chapter 2. Products include Adaptec's VideOh!, which ships with Sonic's MyDVD, and ADS Technologies Instant DVD, which ships with MovieFactory. You might also check out Hewlett Packard's excellent dvd movie writer dc3000, a unique capture card, DVD writer combo.

On the CD-ROM

Trial versions of MovieFactory and MyDVD are on the CD-ROM that comes with this book.

If you're capturing video from DV sources, you can probably work without an external MPEG-2 encoder if your computer is a Pentium 4, 2 GHz or faster. Anything slower than this and the computer won't be able to encode the incoming video to MPEG-2 in real time. Accordingly, you should consider an external USB-based solution.

Note that MovieFactory can only write to DVD in real time if you're using a DVD+RW drive and +RW media. If you have any other type of drive or are using +R medium in your DVD+RW recorder, it will first write to your hard drive, then to the DVD recorder.

Cross-Reference

Recall that in Chapter 4, I discussed factors to consider when purchasing a product to convert tape to DVD, so if you haven't purchased a product yet, you should start there.

Writing to Disc in MovieFactory 2

Just for the record, I'm converting a DV tape from Whatley's gymnastics presentation into a DVD for grandma. I'm working on an HP xw4100 3.2 GHz Pentium 4 computer that should be plenty fast to convert the DV video to MPEG-2 in real time, and writing to an HP DVD Writer 300n, which is DVD+RW-compatible with a DVD+RW disc loaded.

Since I'm converting a DV tape, I'm connecting via the FireWire port. If you were converting an analog tape, you'd first have to make sure that the analog device is properly installed and that MovieFactory recognizes the device.

Then proceed through the following steps shown in Figures 18-1 through 18-4. I'm going through them one by one, so the list looks intimidating, but as you'll see, it's actually a bunch of simple administrative steps.

1. Run MovieFactory, and click Direct to Disc (see Figure 18-1).



Figure 18-1: Selecting DVD format in MovieFactory 2.

2. Select the DVD format; note that you can also write directly to VideoCD and Super VideoCD.
3. Click On-the-fly (see Figure 18-2). Note that if this option isn't available, you either don't have a DVD+RW drive, or you don't have DVD+RW media loaded. In these instances, you can proceed through the following steps, but MovieFactory will first write the data to hard disk, then to DVD.

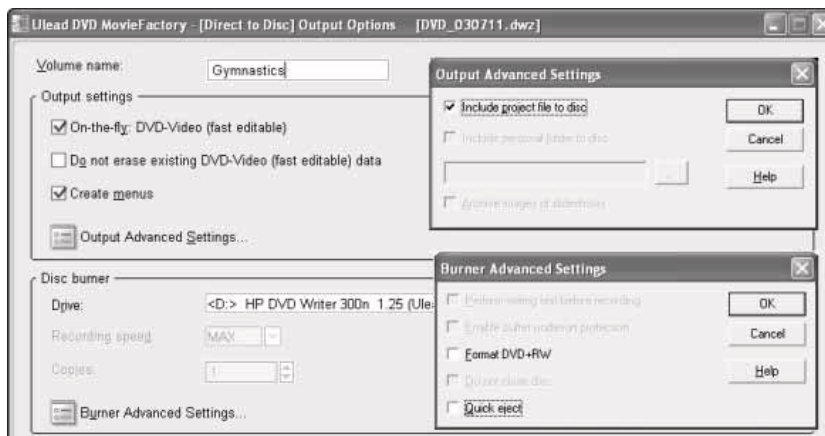


Figure 18-2: Setting the DVD-related output options.

4. Click Create menus, which you'll work on in Step 7.
5. Click Output Advanced Settings and check Include project file to disc. This will enhance your flexibility down the road if you attempt to edit the disc.
6. Click Burner Advanced Settings and uncheck Format DVD+RW (there's no need for this; the burner can just overwrite any content). Also uncheck Quick eject (which makes the recorded DVD+RW disc less compatible on some older DVD players). Close both windows and click Next at the bottom of the dialog.
7. You're now in the menu creation window (see Figure 18-3). Click the title on top of the menu to open a small window allowing you to change the text, font, and font color.

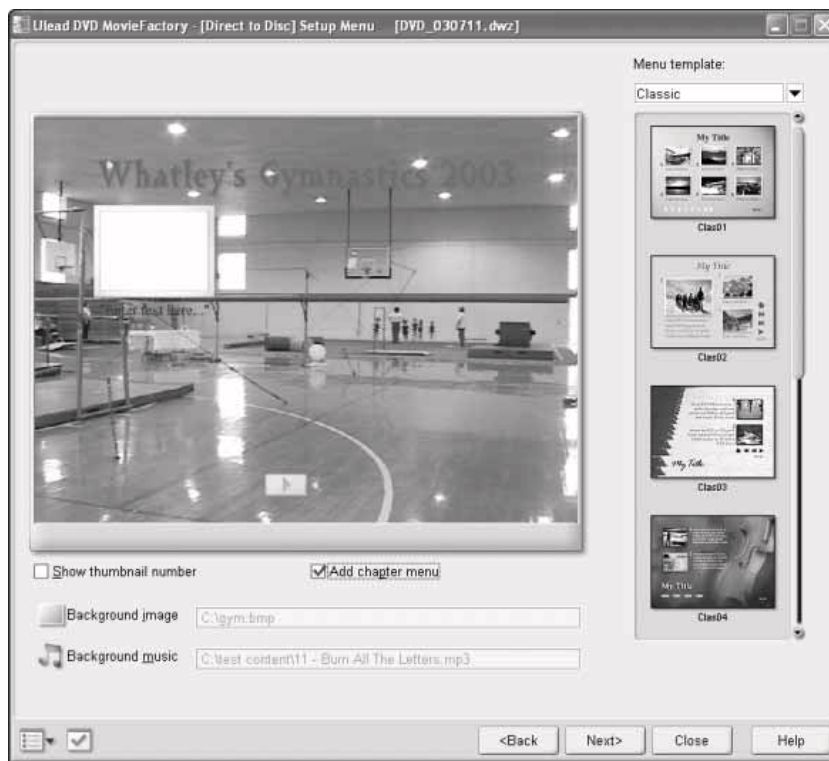


Figure 18-3: Creating your menu and background audio file.

8. If desired, insert another background image, or choose a different template on the right. Note that there is a 30MB limit for menus recorded in real time with MovieFactory. If you select a background audio file (which I didn't), make sure it's short or you may bump up against that limit.
9. Click Add chapter menu, which adds menus for the chapters you're going to create in the next screen. If desired, click Show thumbnail number, which will show the thumbnail number along the chapter frame.

10. Select Capture by total duration and insert the duration of the tape you're converting (see Figure 18-4). This is *very important*, because it's the control that lets you walk away. If you don't select this, MovieFactory will continue recording until you tell it to stop or simply run out of disc space.

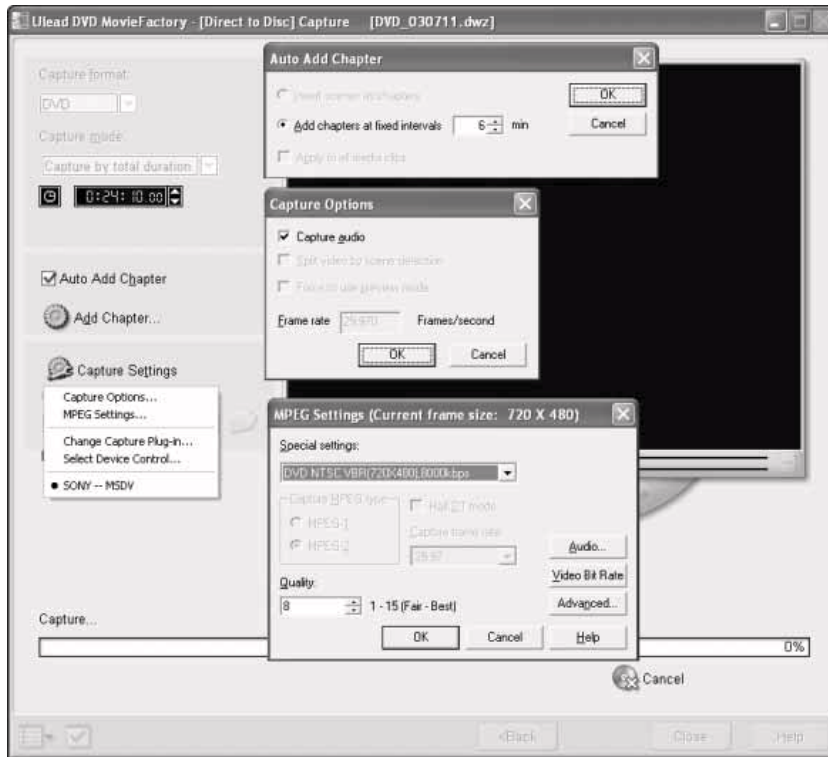


Figure 18-4: The Capture dialog box where you control the capture settings.

11. Click Auto Add Chapter to add chapters to your video.
12. Click the Add Chapter button to open the Auto Add Chapter menu; enter the desired interval (I used six minutes).
13. Click the Capture Settings button and select Capture Options. Make sure Capture audio is checked and close the dialog.
14. Click the Capture Settings button and select MPEG Settings. Here you need to select the highest data rate that will capture and store your video on disc. Table 18-1 shows the approximate number of minutes available for each data rate. Choosing variable bitrate encoding (VBR) as opposed to constant bitrate encoding (CBR) will probably deliver more minutes per disc, but you can't count on it (though I would choose VBR nonetheless). Close the dialog after making your selection.

Table 18-1: Minutes of Stored Video for Each Encoding Setting

2,000 kbps (MyDVD only)	311 minutes
4,000 kbps	155 minutes
6,000 kbps	104 minutes
8,000 kbps	78 minutes

15. Turn on your analog source, press play, and you should see video in the preview window. If you don't, either you don't have the capture device properly installed and selected or your cables aren't connected. Make sure you see video in the window before clicking Capture & Burn.

At this point, MovieFactory takes over, and the recording light on your DVD recorder should show frequent action. You can cancel at any time, but you lose what's been captured. One irritating feature of MovieFactory is that it doesn't save your project settings, so if you cancel and start over, you have to go through every step again.

After the video reaches the timed ending point, VideoStudio takes a moment to create the final menus and then finalizes the disc. Figure 18-5 shows the final result. It's time to lick the envelope and send the disc to grandma (wonder if she'll notice the title was missing).

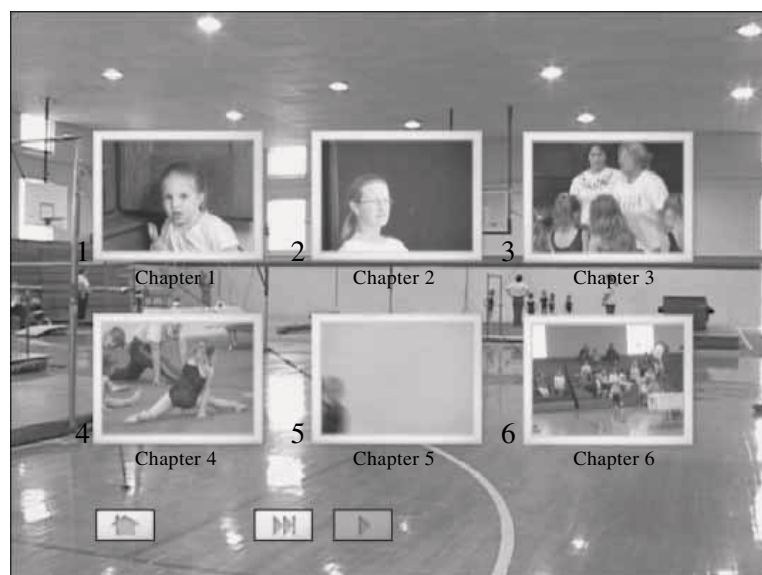


Figure 18-5: Here's our final video, converted and stored in real time. Oops, no title!

A Quick Note on Converting VHS Movies

Legalities aside, note that Hollywood VHS tapes that can't be copied from VHS deck to VHS deck can be captured by your computer and converted to DVD. That's because the copy protection scheme used by Hollywood subtly affects VHS deck writing heads in a way that doesn't impact video capture on the computer.

As with all video captures, however, you'll get substantially better results if you capture via S-Video, an output most consumer VHS decks don't support. It will work with composite inputs, but you may be disappointed with the quality.

One-Step Conversion in MyDVD

Unlike MovieFactory 2, MyDVD doesn't write to the disc in real time; it stores the captured video into a temporary file, then encodes, creates the menus, and finally writes to the recordable disc. You can start things running and walk away, but the process takes slightly longer than MovieFactory 2.

For the record, I'm working with a Pentium 4 3.06 GHz computer, writing to a Pioneer A05 DVD-R/RW drive. Once again, I'm capturing from a DV camcorder via a FireWire port.

By now you're familiar with my pathological dislike for placing temporary and captured files in the Windows My Documents folder where they can't be easily found and deleted. This wasn't an issue with MovieFactory since all files were written directly to the DVD. Here, however, MyDVD will be storing a boatload of captured and temporary files, and you need to place them in a separate folder.

So run MyDVD, choose File → Preferences from the top menu bar to open the screen shown in Figure 18-6. Change the location, if desired.

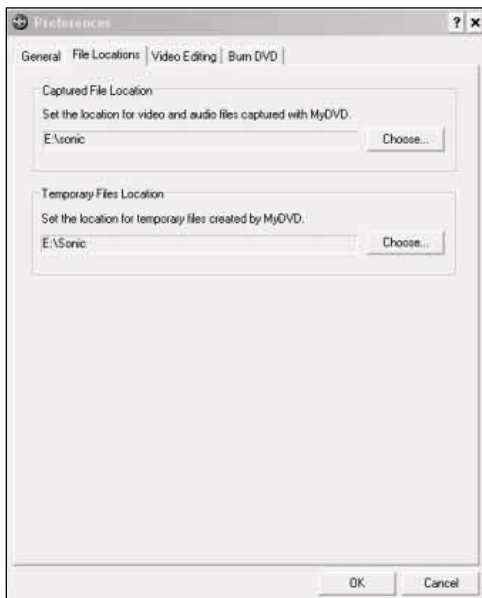


Figure 18-6: You gotta put those captured and temporary files where you can find them.

Now that that's squared away, let's begin the process, which not surprisingly is similar to MovieFactory 2. Follow the bouncing ball in Figures 18-7 through 18-12.

1. Run MyDVD and select Transfer Video Direct-to-DVD (see Figure 18-7).



Figure 18-7: Converting tapes to DVD in MyDVD begins here.

2. Check Record to DVD (see Figure 18-8).
3. Type the desired project name, which becomes your title (Whatley's Gymnastics 2003 in this case).
4. Either check No menus. Just play movie., or click Edit Style to customize your menus.
5. Customize your menu as you desire (see Figure 18-9). In this case, since there is no limit on the menu-related data stored to disc, I chose a background audio track. When complete, close this window and click Next to move to the next screen.
6. Set the capture duration by entering the total length in the field below the Set capture length option (see Figure 18-10). Once again, if you don't set this control, MyDVD won't automatically stop, and you'll have to be there to stop it manually.
7. Click Settings to open the Record Settings screen (see Figure 18-11). Here you select the desired encoding rate, and whether to encode audio and video. See Table 18-1 for estimated durations, and note that MyDVD also tells you the "Record time available" in the Details screen shown in Figure 18-10. Click OK to close the dialog.
8. This is a tough call. MyDVD offers both content-based and time-code-based scene change detection. The problem is that in many instances, either technique (see Figure 18-12) will produce too many scenes. For example, in the gymnastics video, I had 38 scene changes, which is probably too many for comfortable DVD navigation. Since I had to hang around and write this chapter anyway, I chose to select chapter points by hitting the space bar, but if you select this option, you obviously can't walk away.

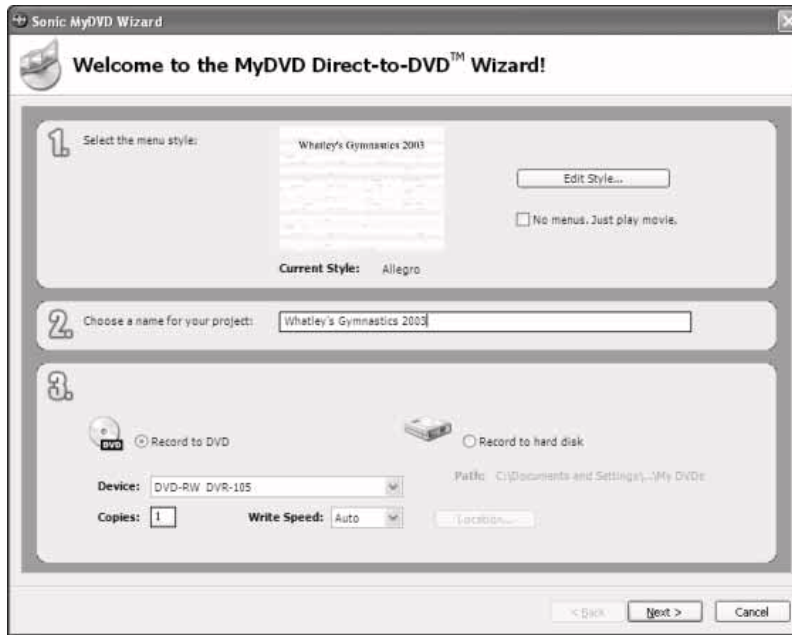


Figure 18-8: The first MyDVD Direct-to-DVD wizard box.



Figure 18-9: The Edit Style dialog where you can customize your menus as you like.

9. If you roll tape, you should see video in the window. Click Start Capturing, and you're on your way.



Figure 18-10: Last stop before burning to DVD.

After capturing the designated duration or stopping capture by clicking Stop Capturing, MyDVD starts assembling the project. While this took only a few moments with MovieFactory, MyDVD took 30 minutes after capturing the 54 minutes of video to finalize the disc. (See Figure 18-13 for the finished result.)

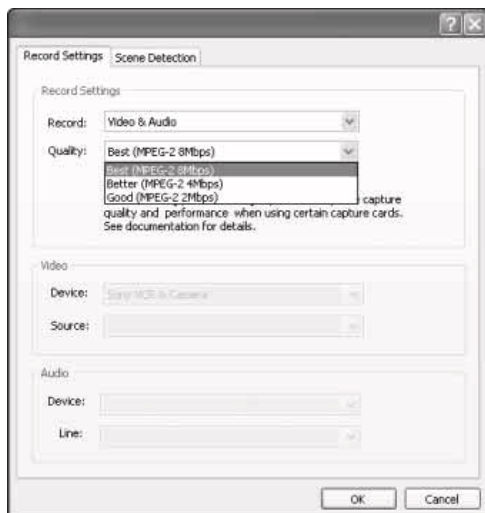


Figure 18-11: Setting the encoding rate in the Record Settings dialog box.

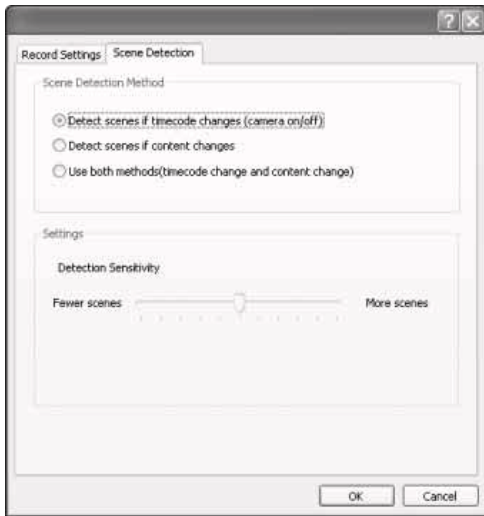


Figure 18-12: The Scene Detection dialog box.

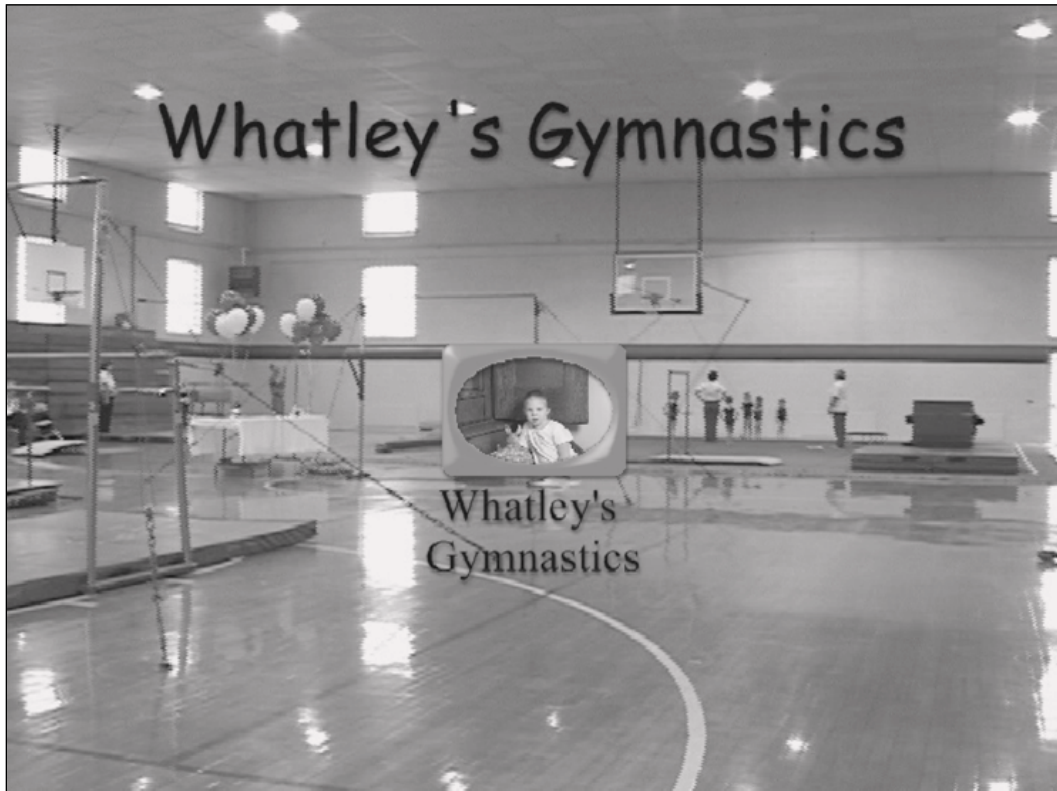


Figure 18-13: The completed DVD produced by MyDVD (title and all). Clicking the icon on the screen will take the viewer to the first menu with chapter points.

The primary difference, of course, is that MovieFactory was encoding and writing to the disc all along, while MyDVD didn't start writing to disc until after capturing and creating all necessary files. Still, you can set it up and walk away, which is a nice luxury.

Summary

This is a summary of the key points from this chapter:

1. To convert VHS or other tapes to DVD, you'll need:
 - The appropriate capture device (analog or FireWire).
 - A software program that automates this function.
 - A fast computer.
 - The appropriate recordable drive and media. For example, MovieFactory 2 can only operate in real time when writing to a DVD+RW recorder with +RW media.
2. Note that direct-to-disc doesn't always mean direct-to-disc. For example, MyDVD first stores the video to hard disk, then writes to DVD. The advantage of this is that you have complete flexibility regarding options like audio menus, which may be limited in true direct to DVD schemes, or even video menus and buttons. The obvious disadvantage is time.
3. Setting capture duration is the critical parameter that lets you get up and walk away from the computer. Forget this at your own risk.
4. Remember to choose encoding parameters that match the duration of the tape you intend to convert to DVD.
5. Time-code- or content-based scene detection is a great feature while capturing for editing purposes but may create too many menu points if used as the basis of selecting chapters on your DVD.

FEEDBACK

“Set up a Red Hat machine and put it online,
outside your firewall, for a few weeks.
You’ll experience no security problems!”



OPEN UP TO OPEN-SOURCE

I STRONGLY AGREE with John C. Dvorak’s thoughts about open-source software in his column of December 30. A lot of the best software is created by open-source developers. Big companies make their software for the almighty buck, whereas open-source developers do it simply to advance the state of the art and make better programs. I don’t know about the rest of the world, but I would gladly donate \$5, \$10, or even \$15 to these developers for their software. This is a lot better than dishing out \$60 for a similar title that does the same thing, only not as well.

BENJAMIN AUBIN

OUTPOURING OF SUPPORT FOR MAC COVERAGE

I’M RESPONDING TO “Hit the Road, Mac,” a letter on your Feedback page of January 20. I think it’s great that *PC Magazine* looks at other OSs and hardware platforms. Sure, Windows machines have the majority of the computer market, but that doesn’t mean we should ignore other technologies. Macs are superior for some applications and for some people; to disregard them completely is irresponsible, especially for a professional. I pay for oranges, but an occasional apple helps keep my mind sharp and aware of the total picture.

JOHN BERGERSON

THOUGH I HAVE BEEN USING MACS almost exclusively since 1984, I subscribe to *PC Magazine* for a variety of reasons: to get valuable technical information for my lone Windows PC, to see reviews and comparisons of various systems and software, and to read your stimulating columns on broader technology issues. As I see it, given the convergence of technologies—and the growing number of multi-platform networks—coverage of Apple products, Linux matters, and other developments is essential. Otherwise, *PC Magazine* wouldn’t serve as a valuable guide for personal and business computing. Your broad coverage helps to validate your bona fides.

SCRIBNER MESSENGER

AS A LONG-TIME PC USER I am delighted to see your Apple coverage. In December 2002 I purchased a Mac to do video editing and subscribed to a Mac-centric magazine hoping to find helpful information.

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Believe me, you do it better. I discontinued that subscription and rely on your articles. I still use my PC for text work, but please continue with the Apple coverage.

PAT MITCHELL

I BUILD AND REPAIR WINDOWS BOXES for a living, but I like Linux, and one of my coworkers is a Mac specialist. I rather like reading *PC Magazine*’s coverage of Macs. A Mac is a PC, regardless of whether you own one or care about them. Macs may appeal to a niche market, but if Apple would price the silly things a bit lower, where more people could get them, it’d have a larger market share. The Mac’s design elegance and ease of operation certainly make it worthy of coverage.

ROBERT ROYE, JR.

LINUX FAN: WE’RE MORE SECURE THAN MICROSOFT WINDOWS

IN HIS COLUMN OF NOVEMBER 25, Michael J. Miller wrote, “I don’t buy the idea that other operating systems are any more secure than Windows.” Well, he may not have tried using a Linux system on the Net. Get Red Hat 9 and install it with medium security level and default settings. Put it online, outside your firewall, for a few weeks. You’ll experience no security problems! You can use the Web and e-mail without worry. Don’t take my word for it; try this yourself.

Miller says there have been several “destructive” Unix worms over the years, but that’s nothing compared with the trouble Windows viruses are causing every day. Where’s his sense of proportion? There is no antivirus software for Linux viruses, because we don’t need any. Antivirus software could be used on a Linux-gateway system to protect the poor Windows systems on the network, but Linux is virtually problem-free.

Linux users don’t have to worry about e-mail viruses either, because HTML mail is only shown as source (on default settings) in pretty much every mail program, executions of mail-attached code are very rare, and user privileges usually prevent writing to executables. Miller says Windows and Office are attractive targets because they’re so popular, but I think this is a lie perpetrated by Microsoft PR. The truth is, Windows and Office have built-in features that bypass security and let hostile software run, install, and spread without the user ever knowing. Miller admits that “having a few non-Windows machines in the office makes sense,” but what’s the justification for having any Windows machines in the office?

JUKKA LIND

Corrections and Amplifications

■ In our story “Hot Shots, Cool Cuts” (October 1, page 98), we stated that the Canon Optura 20 ships with a separate battery charger. In fact, it comes with only a standard AC cable; you charge the battery by plugging the AC cable into the camera.

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1. Wireless connectivity and some features may require you to purchase additional software, services or external hardware. Availability of public wireless LAN access points limited. 2. Battery life may vary depending on product model, configuration, applications, power management settings and features utilized. Recharge time varies depending on usage. Battery may not charge while computer is consuming full power. After a period of time, the battery will lose its ability to perform at maximum capacity and will need to be replaced. This is normal for all batteries. To purchase a new battery pack, see the accessories information that shipped with your computer or visit the Toshiba web site at www.accessories.toshiba.com. The 10.8 hours were achieved via additional SelectBay™ battery. Tecra and SelectBay are registered trademarks, and ConfigFree is a trademark of Toshiba America Information Systems, Inc. and/or Toshiba Corporation. Intel, Centrino, Intel Inside, the Intel Centrino logo, and the Intel Inside logo are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries. Microsoft and Windows are registered trademarks of Microsoft Corporation in the United States and/or other countries. Product specifications, configurations, prices, system/component/options availability are all subject to change without notice. Reseller pricing may vary. © 2003 Toshiba America Information Systems, Inc. All rights reserved.

ExtremeTech

DVD Burning: Between Extremes

You can have DVD burning two ways: simple and limited or arcane and flexible. Or at least that's the conclusion I'm forced to draw after sampling a bunch of retail and shareware DVD-authoring and -editing tools.

At retail outlets, you can find any number of tools that will take your photos or videos and build a DVD, complete with an up-front menu system with buttons and a textured—maybe even animated—background. The packages range from very good to merely okay, but all of them have built-in limitations, primarily to keep you from getting lost in the maze of formats, constraints, files types, and all-but-impenetrable mysteries that make up a DVD.

On the other hand you have freeware and shareware—much of it developed by dedicated open-source programmers—that will let you do almost anything you want with a DVD. You can build a regionless DVD that will play anywhere in the world. You can copy a commercial DVD and strip out the lock that prohibits you from skipping over the FBI warning—not that I'm recommending that; it's just a byproduct of total flexibility. You can structure your DVD any way you want, which also means that you will thoroughly confuse many of the DVD players on the market.

DVD players are confused enough by recordable discs. If you're planning to record DVDs so that you can distribute family videos and photos, be prepared for incompatibilities. Sonic MyDVD is a *PC Magazine* Editors' Choice winner (www.pcmag.com/article2/0,4149,1318351,00.asp), and its DVD-burning engine is licensed by the majority of DVD-authoring tool makers. MyDVD's manual recommends that you practice burning on a DVD-RW or DVD+RW so you don't waste expensive DVD media while you're perfecting your authoring skills.

That's exactly what I did, using my Toshiba Portégé M100 laptop and a Micro Solutions Backpack DVD-RW outboard burner. The M100 and the Backpack are a nifty digital-media team: The laptop has USB 2.0 for fast transfers and a FireWire port for digital camcorders and other devices, while the Backpack will burn just about every CD or DVD format yet invented and comes with all the software you need to make it work.

Through no fault of the Backpack drive, I had trouble finding a DVD drive around my house that would read the DVD-RW I burned. Basically, every unit that was more than a year old was out of luck. The M100's built-in DVD drive, a Targus outboard drive for a Toshiba Tablet PC, and my son's IBM ThinkPad R40 were the only devices, besides the Backpack itself, that could read it. The older high-end Toshiba DVD player in my home theater system had this opinion: Disk Error. More DVD players can read DVD-R than DVD+R, and in fact, my home theater system reads DVD-Rs just fine.

I had a specific task—converting a WMA file to DVD—and MyDVD did that but wrapped the content in a menu with annoying music and truncated the black lead-in and lead-out slides I had wanted in the video. I figured that in the time it would take to create a silent audio track and a blank background image, I could learn enough to build a DVD the way I wanted with an open-source tool.

I downloaded (and paid for) a copy of Super DVD Creator (www.alldj.com), even though the reviews were uneven at best, because it supports WMA-to-DVD conversion. I was somewhat surprised that I had to download another program, IfoEdit, which would separate the WMA video and audio streams into separate files and then reassemble them into DVD-compatible files, which would then be used to burn the DVD.

IfoEdit got me deep into the esoterica of DVD files. I learned more than I wanted or needed to know. IfoEdit is barely a Windows program; it's mostly a script editor that executes a bunch of specific file conversion and creation tasks. But once you build your task list, you can do almost anything you want with a DVD. It's not pretty, but it works. For my purposes (a single-video, menuless DVD) this program was perfect.

Even after you've crossed the knowledge chasm, low-level DVD editing is not easy, but you could make it a geeky hobby. In the meantime, I'm looking forward to software that handles the gritty details and gives me the control I want.

Bill Machrone is VP of editorial development for Ziff Davis Media. Visit his digs at www.extremetech.com. You can also reach him at bill_machrone@ziffdavis.com.



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Little fish affordability

John C. Dvorak

The Big One

Californians like to talk about the Big One: the disaster-of-the-century earthquake that will wreck the state. It's coming soon, they say. Well, so is the big attack that will shut down the Internet completely and destroy all computers—the online equivalent of the Big One. So far, all we've had are slight tremors.

The viruses and denial-of-service attacks we've seen so far are nuisances. They clog up e-mail systems or send inane messages. The most efficient attacks spread rapidly and then are eradicated by patches and updates to antivirus programs. But we haven't yet seen an attack that delivers a serious payload both to the machines propagating the problem and to the Internet infrastructure.

To accomplish this would require using all available means to penetrate every machine and spread virally while destroying data and erasing hard drives everywhere at once. A disaster like this might finally make the community take some action. We already know that users will always do dumb things to trigger problems. But the computing environment itself encourages this, in many ways. Here are my concerns.

24/7 computing. I have failed to grasp the push by Microsoft and others for being online 24/7. Cable modem lash-ups are the most dangerous high-speed weapon in a DNS attack and are installed as always-on connections in the homes of the most naive users.

These connections are just inviting attack bots. Some companies provide a simple on/off switch that would at least take a machine off the Net, but how many people seek this out? 24/7 home and small-office computing is a dangerous concept; it's a trend that needs reversing.

Instant messages. The always-on notion has led to the creation of numerous IM networks. Some analysts have even predicted that the future of business would depend on IM. But why do we need to know when somebody is online? Just to say hi? Direct computer-to-computer links like IM are channels for future problems.

Cookies and spyware. Who ever thought that browser cookies were a good idea? I'm not even sure they're legal: I was under the impression that hack-

ing was against the law. The last time I ran Ad-aware on my machine, it turned up 54 processes sending marketing data (and who knows what else) to various companies. I didn't give anyone permission to do this. Shame on companies—all of them—that insist on using cookies and demand that users allow them before they can access a site. You can be certain that when the Big One hits, cookies will somehow be involved.

ActiveX, Java, and Word macros. Why are Web sites and word processing documents allowed to run programs, macros, and applets that can access my hard drive and damage it? Who benefits from this, and who thought this was a good idea?

Digitally signed certificates. Can you say “false sense of security”? When you install code obtained online, you'll often see pop-up certificates that assure you that the software is from, say, Microsoft and is not malicious. VeriSign has already been tricked into giving these certificates to hucksters posing as legitimate companies, and how hard is it to produce a counterfeit certificate? Nobody ever looks into this.

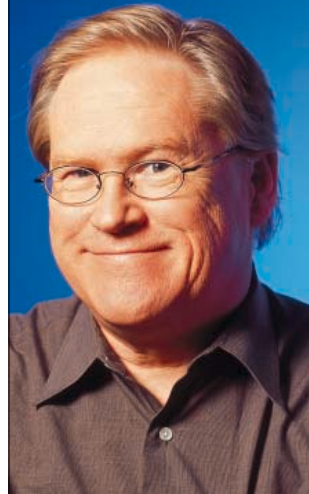
Trusted computing. Centralized monitoring and new complexity aren't foolproof. The Big One will hit sooner rather than later, thanks to the monocultural nature of computing.

Except for about 10 percent of us, everyone uses Windows and Outlook Express. Monocultures are dangerous, because they can be ravaged by disease in a chain reaction. Microsoft's Trusted Computing model makes this worse by centralizing control at a single point where actions must be approved to keep a machine safe. Essentially, this turns the monoculture into a single organism.

By hijacking control or disabling the central control mechanism, someone can shut the entire organism down completely and possibly permanently. Even all the Microsoft geniuses and computer experts in the world can't make this concept foolproof. Trusted Computing is the biggest threat to security ever.

All I see is a disaster waiting to happen in an environment that invites disaster.

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



A serious attack will spread virally while destroying data and erasing hard drives everywhere at once.

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JOHN C. DVORAK

Well, At Least Someone Is Making Money Dept.: In the futuristic world of a Sylvester Stallone movie, *Demolition Man*, a character says, “Now **all restaurants** are Taco Bell.” I was thinking of that line when I saw a recent microprocessor-related lawsuit; I suspect that in the future, the only people who will make any money are lawyers. Patriot Scientific of San Diego has managed to get a **patent for variable-speed clocking** technology and intends to **sue everyone**. More power to the company, since this is what the public seems to want. After all, why do we keep reelecting the same legislators?

If you want to follow this suit, let me brief you in advance: IBM and Intel will see the suit as a threat. They’ll find a million things Patriot Scientific is doing wrong. **They’ll sue Patriot**. Then IBM and Intel will find all sorts of prior art and **sue** again. Patriot will **countersue** over something or other. It will go on for about two years. Nothing will come of it except lawyers getting a lot of money.

While we’re on the subject, the case of SCO versus Linux is worsening. SCO is sending out nasty notes to a purported 1,500 possible copyright violators. It’s going to **sue, sue, sue!** I thought the framers of the Constitution wanted speedy justice. Exactly how long is this miserable situation going to continue?

It’s Gone International Dept.: Not that I want to belabor this point, but one other case worth mentioning is the recent **complaint** from TSMC (Taiwan Semiconductor Manufacturing Company) about up-and-coming SMIC (Semiconductor Manufacturing International Corp.), its mainland-Chinese rival. This suit is over **industrial espionage**. TSMC claims that SMIC contacted a TSMC engineer and somehow squeezed the engineer for information. Trade secrets—not patents—were involved.

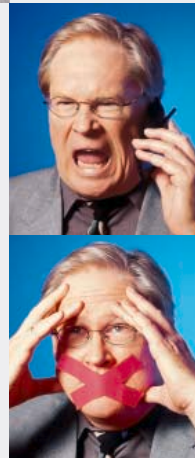
Here is what the mainland Chinese

don’t get. The way this is supposed to be done is: SMIC hires the TSMC engineer for a huge amount of money. TSMC squawks and shows noncompete and nondisclosure contracts. The engineer then **sues** TSMC for restraint of trade, unfair practices, trickery, or whatever, thus distracting TSMC from suing SMIC for anything other than unfair practices. I’m available for consulting on these matters: Just dial 1-555-SLEAZEBALL.

Waiting in Airports Dept.: One of the unintended consequences of increased airport security is being stuck waiting at the airport. The airlines want you to arrive 2 hours early, and often you end up at the gate with an hour (or more!) to kill. One of the best ways to use this time is by watching a movie or even a TV show on the computer. So you look for the **lone power outlet** to plug in your laptop. Ah, technology.

You can transfer video to a hard drive using any number of devices. One product is the new \$179 Plector Convert-X **real-time video capture** box, which takes a TV stream from any source, turns it into an MPEG file, and outputs it to the computer via USB. (Such devices usually support FireWire instead of USB, since they’re mostly used with Macintoshes and Final Cut Pro.) Using InterVideo’s WinDVD as go-between software, the Convert-X can produce any number of output formats, including VCD. All of this can be **captured on your hard drive** and played whenever you want.

The bad news is that the InterVideo software crashes a lot, on my machine at least, and suffers from the problem I’ve encountered with almost all DVD-burning applications: If you have **more than one** installed on your computer, it’s likely that none of them will work. Some sort of conflict arises that Windows XP cannot resolve. So you end up uninstalling everything and then reinstalling the app you want to use. And even that may **not work well**, after you’ve made the initial mistake.



SCO is sending out nasty notes to a purported 1,500 possible copyright violators.

Part of the problem is that many DVD-burning applications have similar code bases, and you end up with a mishmash of DLLs that never get fully removed during an uninstall, since they are shared.

This lash-up is **not the most efficient** for making DVDs from captured video on your hard drive. For that, I recommend simply getting a DVD video recorder like the ones available from Gateway and HP. For \$299, you can get a Gateway AR-230 DVD recorder that hooks up to your TV or VCR and records a DVD on the fly. This is about the price of a good high-end DVD player, with the **added benefit** of being a recorder. It can also record in DVD-EP (4-hour) and DVD-SLP (6-hour) modes. It will play back just about anything, including VCDs, and it has component and progressive-scan output. **Highly recommended.**

Creepy News of the Week Dept.: Now Sony and Honda are both making humanlike robots. In the past, Sony has concentrated its technology on creating **doglike robots**, while Honda has been using its robot to do TV commercials. Now Sony has come up with a humanlike robot that can jump and run, which seems to be incredibly difficult to accomplish. I don’t know about you, but these robots are **creeping me out**. These companies should **stop now**, before they teach the robots to kill us!



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TECHNOLOGY



On Technology

The Bluetooth Car

Silver is the most popular exterior car color in North America. Blue ranks fourth. In terms of car technology, though, the Bluetooth wireless option for hands-free cellular calls currently ranks a lot lower than fourth, but you may find it useful in your next car.

Hands-free calling lets you keep your eyes on the road. In Europe, which has laws (similar to those in some U.S. cities) restricting drivers from using cell phones, having a Bluetooth connection between car and cell phone is already popular. And with Europe's population density making cellular coverage nearly flawless, more opportunities exist there for *telematics* (in-car communications and computing) using Bluetooth.

About a dozen Bluetooth phones supporting the Hands Free Protocol (HFP) are available from Nokia, Siemens, and Sony Ericsson, if you use GSM service from AT&T, Cingular, or T-Mobile. Since GSM is already standard in Europe, the cost of making Bluetooth phones for North America is small. But good luck using the CDMA (Sprint and Verizon) or TDMA (AT&T) networks; Bluetooth is very limited with those services, since there are virtually no Bluetooth phones available here. And sticking a Bluetooth SD card into your phone would not create an HFP link.

Why would you want in-car Bluetooth, especially when it might be a \$300 option on a new car, or a \$750 retrofit on your current car? For starters, the alternative costs more: You might pay as much as \$1,000 for what amounts to a year-old handset—modified to work with one car model—that you can control with steering-wheel buttons or voice commands and that displays information on the instrument panel. But a Bluetooth phone would work with any Bluetooth car.

I recently drove two cars equipped with Bluetooth: an Acura TL with built-in Bluetooth and a Jeep Grand Cherokee with a \$300 add-on called UConnect. There are also Bluetooth-equipped BMWs, Lexuses, Lincolns, and Toyotas.

Acura's version of Bluetooth, called Hands-FreeLink, is about as good as such products get right now. It's included in the base price (\$34,650) of a comfortable and incredibly fast five-passenger sedan

(270 horsepower accelerating 3,500 pounds), with an amazing DVD-Audio system and one of the best navigation systems available.

In a car like the Acura TL, Bluetooth is icing on the cake. You set up HandsFreeLink by pairing the phone with the car. Then you can control the phone from the dashboard whenever it's in or near the car. Press the Talk button on the steering wheel and say a name or number and your cell phone dials the number from the car's phone book. Dialing and caller information as well as signal and battery strength appear on the instrument panel. When you use the car's Alpine-based navigation system, you can auto-dial phone numbers associated with points of interest, such as hotels and restaurants. The only downside is that the car's phone book can't sync with the one in your phone.

Chrysler is the first North American car manufacturer to offer Bluetooth. UConnect on the Grand Cherokee is useful but less polished, since it takes the form of a small button pad mounted near the radio/navigation system. It connects to the car by a thin wire that disappears into the audio system faceplate. A talk button activates voice recognition for dialing, ending calls, adjusting the volume, and muting.

The Chrysler Pacifica and Dodge/Chrysler minivans integrate the controls more fully, without the in-dash button pad. Either way, the UConnect components are familiar PC parts: an Intel X-Scale CPU, a Broadcom Bluetooth chipset, IBM ViaVoice software, and the QNX operating system.

Bluetooth neither helps nor hurts the accuracy of voice recognition, which is also used to control the audio and navigation systems. Ask the Acura "Miles to destination?" and it sometimes replies, "What station?" This is nothing that a tenfold leap in CPU power won't cure. As for emergency assistance services such as OnStar and Mercedes-Benz's TeleAid, they require an integrated cell phone. OnStar, which has offered optional cellular calling, should be more desirable this year, now that it finally offers digital service while retaining analog service that works better out in the boondocks.

MORE ON THE WEB: You can contact Bill Howard directly at bill_howard@ziffdavis.com. For more On Technology columns, go to www.pcmag.com/howard.



In Europe, having a Bluetooth connection between car and cell phone is already popular.

SOLUTIONS

Your Library Online

With a library card and an Internet connection, you can access a wealth of data from your public library. **BY JANET RUBENKING**

You've probably visited your public library's Web site to see whether it has a particular book in stock, but you may not realize that library Web sites offer free and easy access to an incredible array of online reference materials that would otherwise be too expensive or otherwise inaccessible to most of us. You can track down a biography of Ludwik Lazar Zamenhof, see the

great paintings of Paul Klee, research businesses, or take practice tests to see whether you're ready for the big exam—all from the comfort of your home PC. While many of these references have a decidedly academic feel to them, they provide more and better information than the free Web resources we're used to, such as Google, InfoSpace, and KartOO. The databases are collections of carefully selected material, thereby reducing the clutter of irrelevant results being included because they share some of the same keywords. And since the databases are supplied by services dedicated to their upkeep, you can expect the information in those databases to be more accurate.

WHERE DO I START?

Your typical library Web page has links to its OPAC (online public access catalog), library hours and services, librarians' favorite Web links, a list of pages designed for children and their homework needs, and a link to articles and databases. The articles and databases are your keys to up-to-date and archived newspaper and journal articles, reference material (such as encyclopedias and almanacs), indexes with abstracts and citations, testing and learning materials, career guidance, and much more. Large metropolitan libraries offer a greater variety of resources, but even the smallest libraries offer one or

two comprehensive databases. If you are lucky enough to live in a state with a public-library consortium, residents anywhere in the state have access to the same subscription databases. The Michigan eLibrary (MeL) is one such resource. To find a library near you, visit the Library of Congress State Libraries listings (www.loc.gov/global/library/statelib.html). Many

The screenshot shows the Los Angeles Public Library Literature Resource Center website. At the top, there's a navigation bar with links for 'Home Databases' and 'Research Guide'. Below that is an 'Author Search' section with a search box and a 'Clear Form' button. To the right, there's a 'Spotlight on...' section featuring a portrait of Joseph Heller and the text: 'Joseph Heller There was only one catch and that was Catch 22. from Catch 22'. At the bottom, there are links for 'Home', 'Help', 'Search Tips', 'Research Guide', 'Gale Databases', and 'Contact Us'.

INFOTRAC'S Literature Resource Center offers content on literary figures.

state libraries have local directories for their library networks.

REMOTE RESOURCES

A large percentage of the databases are available through remote access, though there may be restrictions on some. Depending on the library, you can sign on using your library card number, pass-

word/PIN code, ZIP code, driver's license number, or state ID at the home page.

There's a dizzying array of databases available, and your library probably classifies them by subjects such as arts and humanities, business, science, and education. There are basically three types of formats, though there is some overlap among the resources: Full-text databases have complete articles from magazines, journals, and newspapers. Indexed databases contain abstracts and citations from books, journals, magazines, and reference books. Reference databases offer dictionary- and encyclopedia-type sketches.

Most of the databases have tools to save searches, make lists, and print or e-mail articles and citations. For students, the automatic citations generated from marked lists of articles save hours of tedious formatting. The larger databases feature powerful search mechanisms, so check out the help files for instructions. All the databases are updated periodically, some as frequently as several times a day. The following databases are just a few of

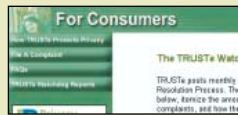
the common resources available through most libraries.

Gale/Thomson's InfoTrac Databases. The InfoTrac Databases are some of the oldest and most common databases around. They offer a variety of resources such as Literature Resource Center, Associations Unlimited, and Busi-

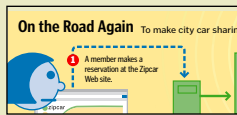
ness and Company Resource, and most libraries subscribe to one or more. Once you enter one of the databases, you can navigate to others without having to log on again. One of InfoTrac's featured tools is InfoMarks. An InfoMark at the top of the page indicates that the URL for the page is persistent and can be saved to your Favorites list for future reference. InfoMarks can be shared with other Gale database users, and they can be copied and pasted into word processing documents, e-mails, and Web pages. Each time



58 Office: Add images to Excel charts.



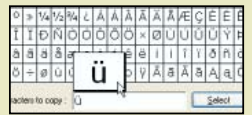
59 Security Watch: Can you trust TrustE?



60 Internet Business: Zipcar rental program.



61 Internet Professional: Credit card services.



62 User to User: Tips and tricks.

MAKING TECHNOLOGY WORK FOR YOU

a saved search is executed, it accesses the most updated information.

Many libraries offer InfoTrac's Biography and Genealogy Master Index and the Biography Resource Center. The Biography and Genealogy Master Index covers 13.6 million biographical sketches from numerous sources, such as dictionaries, *Marquis Who's Who*, subject encyclopedias, and volumes of literary criticism. It indexes sources with multiple biographical sketches rather than articles. Gale adds 300,000 new citations with each update, which takes place twice a year.

For full-text biographical information, use the Biography Resource Center, which contains information on almost 315,000 people throughout history and various disciplines. Here there are biographical narratives, thumbnail sketches, *Marquis Who's Who* entries, and magazine articles pulled from several respected sources. You'll find images and up-to-date reporting from magazines. There is also a research guide to conducting successful biographical research.

Ebscohost Research Databases. The Ebscohost Web of databases provides one easy-to-use tool that lets you search across multiple sources and disciplines. Among the many sources available are Masterfile Premier, with over 1,950 general reference publications; Newspaper Source, with full-text articles from 200 regional newspapers; Primary Search, with more than 60 magazines for elementary school searches; HAPI (the Hispanic American Periodical Index); and much more. Here you can save articles and citations, create a personal account, mark your search results, and add them to your folder. Other tools include citation generation, search alerts, and journal alerts.

Oxford University Press' Grove Art Online and Grove Music Online. Grove Art Online features the full text of all 34 volumes of the 1996 *Grove Dictionary of Art*, with annual additions of new material and updates to original entries. There are over 45,000 articles on the visual arts,

500,000 bibliographical citations, more than 40,000 links to images in galleries, libraries, and museums on the Internet, as well as over 100,000 images from the Bridgeman Art Library.

Grove Music Online represents an integration of the 29 volumes of the *New*

pany reports. You'll find business descriptions, histories, properties, subsidiaries, officers, and financial statements "as reported." The content includes company information and annual reports from organizations in the U.S. and abroad. A report can include financial highlights, profitability ratios, debt management, asset management, stock price, and valuation figures.

Learning Express Library. Learning Express Library (formerly Learn a Test) is a testing resource spanning multiple disciplines and age levels. It offers practice tests for nearly every academic

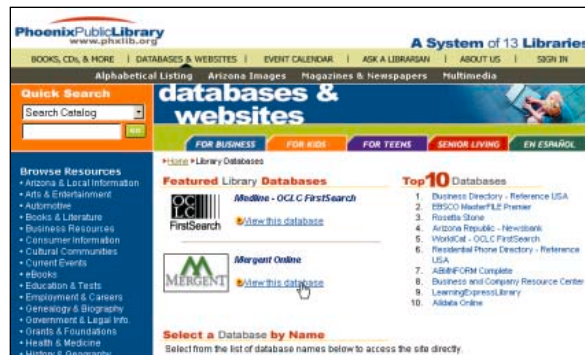
group (from fourth grade and up) and trade groups. There are tests for basic skills in reading, writing, and math, as well as civil service tests, college preparation, graduate school entrance, military, real estate, and much more. Each test includes associated sections, such as reading comprehension, math, and practice tests.

Ebscohost's Searchasaurus and Gale/Thomson's InfoTrac Kids Edition. These kid-friendly reference databases contain magazine and journal articles as well as basic encyclopedia and dictionary resources. Their uncluttered interfaces, fun graphics, and easy search and topic links make navigation simple for children.

USE IT OR LOSE IT

Libraries spend your tax dollars to provide the best information available. In these troubled budgetary times, librarians carefully track database usage and, -regretfully, cut useful resources when money is lacking. It's time to rediscover the library and boost those usage numbers. Become a member and don't forget to visit your library in person, too.

Janet Rubenking works in technical services at the Shields Library, University of California-Davis.



MOST LIBRARIES have a variety of databases available online.

Grove Dictionary of Music and Musicians (second edition), the *New Grove Dictionary of Opera*, and the *New Grove Dictionary of Jazz (second edition)*. It includes biographies, articles, illustrations, sounds, and links. This database includes the new Listening to Grove, with music samples you can listen to with Sibelius's Scorch plug-in.

infoUSA's Reference USA. Reference USA contains detailed information on more than 12 million U.S. businesses, 102 million U.S. residents, and health-care providers. The database also contains information on Canadian businesses and residents (compiled from white and yellow pages); SEC information; federal, state, and municipal data; and numerous directories, trade journals, and newspapers. You can download data on businesses including name, address, phone number, number of employees, principals' names, sales figures, credit ratings, and more.

Mergent Online. Mergent Online offers the same detailed company analysis as its print series, but the online version lets you create and customize multiple com-

Add Images to Excel Projects

Put pictures and graphics in your charts to make visual data more compelling. **By Helen Bradley**

When preparing charts for readers who aren't mathematically inclined, why not make them more fun and less intimidating by using pictures instead of bars? Matching images to the chart's subject matter adds more depth to your presentation. Microsoft Excel includes tools for replacing bars and markers with images, adding images to charts, and saving charts from a worksheet. Here are some ways you can put such features to work on your data.

IMAGES AS CHART BARS

You can replace bars, columns, or areas on most standard or 3-D charts with images (Figure 1). To try this, click on a series on a chart or select a single bar or column. Right-click and choose *Format Data Series* (or *Format Data Point*) and add an image by choosing the *Patterns* tab and *Fill Effects* | *Picture* | *Select Picture*. Once you've selected a picture, click on *Insert* and set the option for image scaling. The best options are *Stack* or *Stack and Scale to*. If you use the latter option, set the number of units that equal one image. Repeat for all the series or bars as desired. Don't worry if your picture looks "squished" in

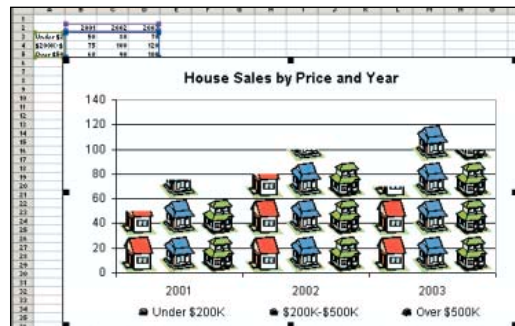


FIGURE 1: You can use images to make your Excel charts more fun and relevant.

the *Format Data Series* pane (Figure 2), it will show up correctly in the chart.

There is a shortcut to the process that lets you use a clip-art image rather than an image from a file. Select the data series or

data point and choose *Insert* | *Picture* | *Clip Art*. Once you've added the image, use the *Fill Effects* | *Picture* tab dialog to scale the clip-art image as you would if you had used an image from a file.

You may find that the typical width of a bar in a chart is smaller than desirable for the image you use. To alter this, right-click on a series, choose *Format Data Series* | *Options*. Decrease the *Gap Width* to make the bars wider and if desired, add an overlap to widen the bars or columns even more.

IMAGES AS DATA MARKERS

Using a similar process, you can add data markers to a line chart, an XY scatter chart, or even a bubble chart. Copy an image to the Clipboard and then select the line (or other chart) series and choose *Edit* | *Paste* to paste the image in place of the current marker. You can also click on the chart series and use the *Insert* | *Picture* | *Clip Art* option to use a clip-art image as a data marker.

If an image isn't the right size or shape or needs cropping, insert it in your worksheet and use the tools on the *Picture* toolbar to crop or resize it. Copy it to the Clipboard and then paste it into the chart.

IMAGES AS CHART BACKGROUNDS

You can also add an image behind the (larger) chart area or the *plot area*, which is the area covered by the bars or columns but doesn't include the surrounding chart elements. With the chart open on your screen, click on

either of the areas. (If you're unsure what you have selected, read the name of the selection from the *Name* box on the *Formula* bar.)

Right-click on your selection and choose *Format Chart Area* (or *Format Plot Area*) and then the *Patterns* | *Fill Effects* | *Picture*. Click on *Select Picture*, locate the image file to use, click on *Insert*, and then on *OK* twice. When you add an image to the chart area, you may need to remove the fill from the plot area so you can see the image. To do this, right-click on the plot area, choose *Format Plot Area* | *Patterns* and set *Area* to *None*.

The bars, columns, data markers, and chart and plot areas aren't the only chart elements that you can replace with images. You can also add images to the floors and walls of 3-D

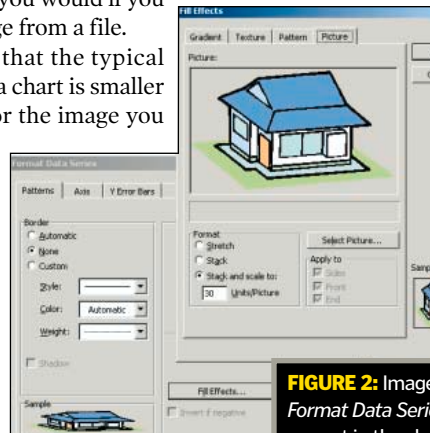


FIGURE 2: Images may look distorted in the *Format Data Series* dialog, but they'll be correct in the chart.

charts as well as to the legend area of charts. Try right-clicking on a chart element and selecting *Format* <chart element> and then see whether the *Fill Effects* button lets you access the *Picture* tab. If this fails, however, don't give up. Instead, copy a picture to the Clipboard, select the element to replace, and choose *Edit* | *Paste*. One of the options will work for most of the elements in your charts.

To use the same image in different forms, as in data markers or legend icons, open your image in your graphics software and recolor or resize it for use in your chart. With judicious coloring, one image can be used multiple times on one chart.

TAKE A PICTURE

You can also save a chart as an image file so you can, for example, add it to a Web page. Although you can do this programmatically, a simple solution is to save the worksheet as a Web page using *File* | *Save As*. When you do this, the chart is saved as a separate GIF file, which you can then use as you would any image file.

Helen Bradley is a contributing editor of PC Magazine.

SECURITY WATCH

Should You Trust TrustE?

Does a privacy seal on a Web site mean you don't have to read the privacy statement? Hardly. **By Leon Erlanger**

Like most users, you're alarmed at the myriad ways that companies exploit the Internet to collect, buy, and sell your personal information. You know you should read all those Web site privacy statements carefully, but really, who has the time? Instead, you give personal information only to reputable companies, and you look for some kind of privacy seal on each Web site. So you're protected, right? Well, not exactly.

An increasing number of Web sites proudly display privacy seals that say "Reviewed by TrustE site privacy statement" or "Privacy, BBBOnline," (with a big icon of a lock). TrustE is a nonprofit organization started by the Electronic Frontier Foundation and the CommerceNet Consortium and sponsored by several major companies including AT&T Wireless, Intuit, and Microsoft. BBBOnline is a subsidiary of the long-standing Council of Bet-

data with other organizations.

Specifically, according to the TrustE Web site, member companies must provide easy access to straightforward privacy statements that disclose what personal information will be gathered, how it will be used, and with whom it will be shared. The statement must also tell you what choices are available to you regarding how information is used, what safeguards are in place to secure your information, and how you can update or correct inaccuracies.

Companies must also provide consumers with the choice to opt out of "internal secondary uses and third-party distribution for secondary uses...unless the sharing is part of a third-party service relationship" such as one with a shipper or retailer. And there are additional requirements that companies must fulfill when they decide to change their practices.

Finally, companies must go through an application process and agree to comply with the organizations' dispute-resolution procedures. Then, when they are accepted in the program, companies pay for the privilege of displaying the seal.

Okay, so perhaps the requirements aren't as strict as you thought, but at least the seal providers pursue violators aggressively, right? It depends on what you mean by *aggressively*. According to TrustE's Web site, the organization received 1,801 privacy related watchdog disputes in 2002 concerning valid TrustE sites. Though all the complaints were investigated, only two actions were taken to revoke seals, according to Fran Maier, TrustE's executive director.

Detractors say that both services suffer from an inherent conflict of interest: They have little incentive to go after the compa-



TRUSTE'S site lets you see how the complaints it receives are resolved.

ter Business Bureaus, which is supported by the dues of hundreds of companies nationwide. The TrustE privacy seal is now displayed on more than 1,300 Web sites, while BBBOnline privacy seals can be found on over 700 sites.

What consumer-friendly practices must these companies follow to get a privacy seal? You may be surprised to know that it boils down to just three: Companies must tell you what their practices are, abide by them, and give you the option to opt out of sharing your personal

THE LOOKOUT

GET PATCHED!

Security experts have found a new way to exploit a known buffer overrun flaw in Windows Workstation Service. Microsoft Corp. issued a patch for the vulnerability in November and listed several workarounds. But penetration testers at Core Security Technologies discovered that one of the workarounds still lets malicious packets reach Workstation Service.

If you haven't applied the patch you're still vulnerable. You can get it at www.microsoft.com/technet/treeview/?url=/technet/security/bulletin/MS03-049.asp.

nies that sponsor or support them. The detractors have a point. For example, in 1999, RealNetworks' RealJukebox was found to be sending user information back to company servers over the Internet, which seemed like a clear violation of its own privacy policy. TrustE's response was to claim that its seal applied only to the company's Web site, so there wasn't much it could do.

Maier reiterated this claim when we asked her about it in a recent interview. RealNetworks stopped the practice in response to a separate class action lawsuit. And in 2002, when the Electronic Privacy Information Center (EPIC) complained that Microsoft had violated Section 5 of the Federal Trade Commission Act by making false claims on its privacy statement, among other things, it was the the FTC who took action against Microsoft over its Passport authentication system, not TrustE.

Industry pundit Esther Dyson, who was involved in TrustE's founding, agrees that TrustE hasn't been tough enough, but she feels that things have been moving in the right direction under new leadership. TrustE's claims that it investigates complaints in good faith and tries first to help companies correct their mistakes. After all, consumers are better off with more privacy seals than fewer. There is a kernel of reason to this argument. But what's the real lesson? Know what these seals really mean, read the privacy statements yourself, and try as best you can to monitor how your personal data is actually used.

Leon Erlanger is a freelance author and consultant.

INTERNET BUSINESS

Leave the Driving To Zipcar

With the help of the Internet and wireless technology, car sharing revs up in urban areas. **By Brad Grimes**

Let's say you live in an urban area. Parking costs a fortune, auto insurance rates are through the roof, and heck, who needs to own a car when you can use public transportation? Still, you could use a set of wheels to run errands, attend business meetings, or get out of town for a while. How on earth can the Internet help you do that?

Check out Zipcar's Web site (www.zipcar.com) to get an idea. In 1999, Zipcar founder Robin Chase saw a car-sharing service in action in Berlin. Cars were parked around the city, and members of the service could rent them by the hour. When she returned to her home in the Boston area, she took the idea to the Internet and launched a hassle-free service that lets members reserve and access a variety of cars without the cost of ownership. Today, Zipcar has more than 10,000 members and 250 cars in the Boston, New York, and Washington D.C., with plans to expand.

"Early on, we offered mostly Volkswagen Beetles," says Nancy Rosenzweig, Zipcar's vice president of marketing. "Now we have a wide range of cars to meet people's needs, from convertibles and SUVs to pick-up trucks and a BMW 325." And if you're a member in one city, your membership is good in other cities.

Here's how Zipcar works. To sign up, go to the Zipcar site and fill out an online application with your credit card and driver's license information. There's a \$20 annual membership fee. The Zipcar server checks with your state's Department of Motor Vehicles to make sure you haven't had any major violations in the past several years. If you're approved, you'll receive a Zipcard in the mail within a few days. This is your ID that lets you access a car.

To reserve a car, log on to the site (you can also call a toll-free number to make a reservation) and tell Zipcar where you want to pick up a car. The site will tell you what cars and times are available in your desired area. When you make a reservation online you receive a confirmation via e-mail. The site calculates the approximate cost that will be billed to your credit card when you use the car. The typical hourly rate is \$8.50, including insurance, gas, and mileage.

Then things get interesting. Zipcars are parked throughout metro areas, near the people who use them. They're not in some rental lot where an attendant can look up your reservation and hand you the keys. The cars also usually have Zipcar's name emblazoned on them somewhere, making them a target for thieves.

So Zipcar's network infrastructure must ensure that only registered members can drive the cars—and only when members have reserved them.

Every car has a Zipcard reader attached to the inside of the windshield. Each reader communicates with an on-board device that contains reservation information for that particular car. When you pass your Zipcard in front of the reader, it matches your information with the reservation stored in memory. If you've reserved *that* Zipcar at *that* hour, the doors unlock and a system inside the car enables the starter. Even if a thief breaks into the car, the ignition doesn't work unless the Zipcard reader authenticates the driver.

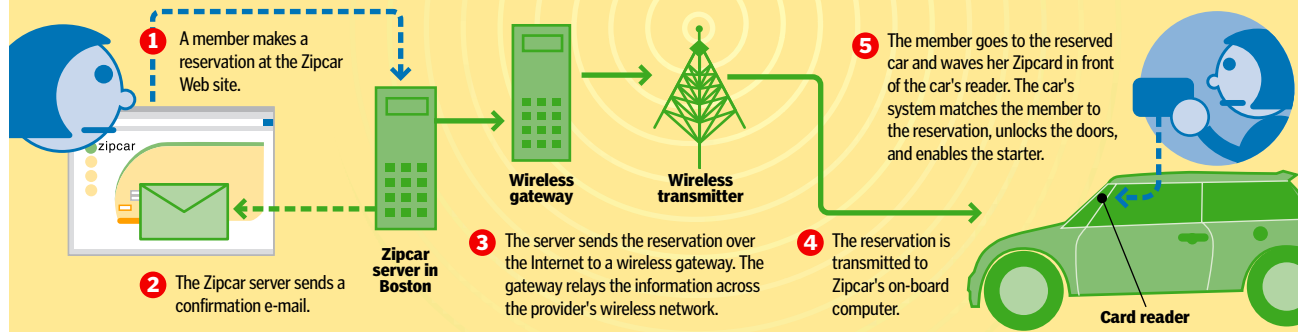
Reservations reach the cars over a wireless link. Zipcar's Boston-based server, which communicates with cars in all three metro locations, periodically pushes reservation information to the cars' on-board systems, which include a cellular receiver. The Web-based reservations leave the server and travel through a wireless Internet gateway. From there, Zipcar contracts with wireless providers in the metro areas using cellular digital packet data (CDPD) technology to transmit the data to the cars.

Information is sent directly to the cars to speed up the reservation process. "By sending data to the cars rather than authenticating on our server," says Roy Russell, Zipcar's vice president of technology, "when a member scans his card the response is instantaneous."

Considering the success of similar car-sharing services throughout Europe (currently in 450 cities), Zipcar is in the fast lane.

On the Road Again

To make city car sharing as simple as possible, Zipcar has set up a sophisticated reservation system.



INTERNET PROFESSIONAL

Creating an Online Store

We help you choose the best approach for your business.

By Sheryl Canter

Online stores have become an essential element of doing business, but selecting from the blizzard of options is difficult. Every online store needs two components: a catalog to display your products and to allow customers to make selections, and a method of accepting payment. Such components are sometimes bundled and sometimes sold separately—and costs vary widely.

An online catalog can be as simple as a one-page product list. But if you want customers to be able to select more than one product at a time, you have two choices.

The simpler method is a multiproduct order page, which lets customers enter quantities next to each item. A single button labeled *Check out* finalizes the selections and brings customers to the payment page. Selections cannot be changed at this point without starting over.

If your online store contains a large number of products, you'll probably want to use a catalog with a *shopping cart*, which can remember customers' selections as they browse your site.

There are three options for accepting payments online: person-to-person (P2P) services, such as PayPal or Yahoo! PayDirect; payment services, which accept credit cards for you; and your own merchant account for taking credit cards.

P2P services are inexpensive (PayPal charges just 2.2 to 2.9 percent of each sale plus 30 cents) but require buyers to register, which can be a barrier to sales.

Payment services are basically resellers. Their payment pages clearly

state that they are actual sellers while you are only the supplier of goods and services. Such disclosure gets around card association rules that forbid a company from accepting credit cards on behalf of

another company. Costs for payment services can vary from 5 to 20 percent of each sale and may include additional fees.

Merchant accounts have lower transaction fees than do payment services (usually about 3 percent), but their service fees tend to be higher (\$10 to \$60 per month). This makes merchant accounts most cost-effective for high-volume businesses.

For U.S. businesses, Electronic Clearing House (www.echo-inc.com) and payQuake

(www.payquake.com) offer inexpensive merchant accounts. If your business is outside the U.S., WorldPay (www.worldpay.com) is a good choice, though its fees are higher.

Most Web-hosting accounts now come with a full-featured, open-source shopping cart called osCommerce. Some e-commerce accounts include a commercial cart called Miva. Both of the carts require some Web development skills to set up, and you must make other arrangements to accept payments.

Digital River's Main Street Stores (<http://mybiz.mainstreet-stores.com>) and Yahoo! Small Business (<http://smallbusiness.yahoo.com/merchant>) offer hosting accounts with proprietary shopping carts, including editing tools for easy configuration. You are still responsible, however, for arranging to accept payment. Yahoo! charges a transaction fee for

each sale. Main Street Stores is less costly, but it is also less flexible in configuring your store's appearance.

There are numerous payment services for digital goods or tangible (physical) goods—some for both. Some services offer order forms but no shopping cart. Some require that you use their shopping cart. Others offer the shopping cart as an option and can integrate with third-party carts.

Pricing details are complex as well. Transaction fees usually include a flat price as well as a percent of the purchase amount, and rates can vary depending on the purchase price and sales volume. Companies also vary in how often they give you your money, whether they charge fees for doing so, whether they bill you for charge-backs (disputed charges), and whether they hold back part of the money as insurance against charge-backs. For full details on the services mentioned below, please visit each company's Web site.

CCNow (www.ccnow.com/sellOnline.html) offers a true shopping cart—but for selling only tangible goods. The fee is \$9.95 per month plus 9 percent of all sales over \$100.

ClickBank (www.clickbank.com/overview.html) handles only digital goods. Its transaction fee is 7.5 percent plus \$1.

Kagi (www.kagi.com/suppliers/suppliers_services.html) is a reseller for both tangible and digital goods. Kagi's transaction fees range from 8 to 10 percent.

RegNow (www.regnow.com/client.html) specializes in software sales. Transaction fees are a whopping 20 percent of each purchase plus 15 percent of whatever you decide to pay your affiliates.

The cheapest and most flexible of the payment services are 2Checkout.com and PaySystems (www.paysystems.com). Transaction fees for 2Checkout.com are 5.5 percent plus 45 cents. PaySystems offers two options: 3.95 percent plus \$1 or 5.5 percent plus 35 cents.

Hiring a consultant to set up your online store may be cheaper in the long run than paying high service and transaction fees. In general, the more work you're willing to do up front, the less you'll pay for selling goods and services online.

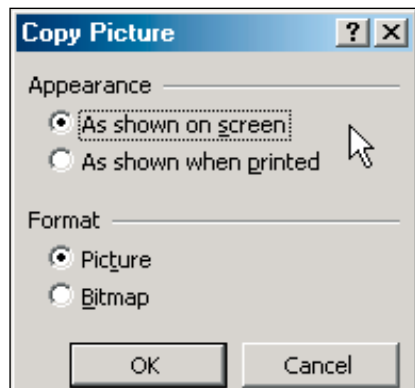
Sheryl Canter is a contributing editor of PC Magazine. You can visit her home page at www.sherylcanter.com.

2CHECKOUT.COM allows you to add your company's header to an order form.

Save a Multipage Image in Excel

What do you do when you want to grab a screen image, but some of the data you want is off-screen? I found a clever way to do this in Excel.

A screen capture of an Excel spreadsheet may only show a portion of the data. If you want to capture an entire multipage worksheet as an image, hold down the



EXCEL'S COPY PICTURE feature lets you copy an entire multipage spreadsheet to the Clipboard as an image.

Shift key while clicking on the *Edit* menu and select *Copy Picture*. Click on *OK* in the resulting dialog to put an enhanced metafile image of the entire worksheet on your Clipboard. Paste the image into a graphics program and save it in JPEG or another graphics format.

MICK TOPPING

Many users know that holding down Shift when clicking the *File* menu in Microsoft Word or Excel subtly changes the menu: *Close* becomes *Close All* in both programs, and *Save* becomes *Save All* in Word. But few realize that doing the same with Excel's *Edit* menu also reveals new functions, specifically making the *Copy Picture* menu item appear. You must highlight the part of the worksheet that you want to copy, otherwise you'll copy only the current cell.

As shown in Figure 1, you'll be asked whether to save the data *As shown on screen* (the default) or *As shown when printed*; the latter will yield a black-and-white

image if you don't have a color printer. You'll also be asked whether to save the image as a *Picture* or *Bitmap*. The default choice of *Picture* saves the image as a Windows metafile rather than a bitmap file.

A metafile is essentially a set of instructions for re-creating your image and is not limited to a specific screen resolution or color depth, making it the better choice. Either way, you won't see an immediate result. You must load the Microsoft Paint accessory or your favorite image-editing program and paste the copied image into it. —Neil J. Rubenking

More on Locking Windows XP Quickly

The article "Quickly Lock the Computer" (www.pcmag.com/article2/0,4149,1206402,00.asp) offers a workaround for the fact that you can no longer lock a Windows XP machine by pressing Ctrl-Alt-Del followed by Enter. Quite a few puzzled readers wrote in, because they found this key combination still works for them precisely the same way it did under Windows 2000.

Why would it work on some systems and not others? The difference involves the use of the *Welcome* screen. If you configure Windows XP to use the *Welcome* screen, Ctrl-Alt-Del brings up *Task Manager*. If you configure it to log on using the Windows 2000 style, Ctrl-Alt-Del brings up *Windows Security* and pressing Enter at that point locks your computer.

To enable or disable the *Welcome* screen, launch the *User Accounts* applet from the Control Panel and click on the link *Change the way users log on or off*. The box titled *Use the welcome screen for fast and easy logon* controls whether the *Welcome* screen is displayed.—NJR

Accented Characters in E-Mail

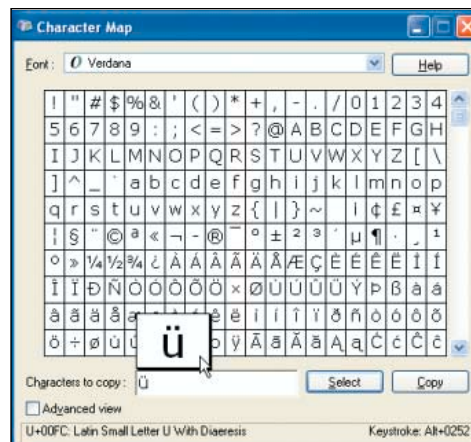
I use my computer primarily in English, but I frequently correspond with others in Spanish and French. Although I can create accented and special characters in my word processor, the same key combinations don't produce any accents in plain-

text or HTML e-mails in Outlook (or in MSN Hotmail, for that matter). How can I type accented letters into Outlook e-mail messages?

MATT TOCKS

You've probably learned the special keys in Microsoft Word. For example, pressing Ctrl-Shift-<Colon> before a vowel adds an umlaut to that vowel, such as ü. The special keystrokes don't work in Outlook, but you have several alternatives. For example, you can compose an e-mail message in Word and paste it into Outlook. Or you can compose the message in Word and then choose *File | Send To | Mail Recipient* from the menu. Another way is to select *Tools | Options* from the menu, click on the *Mail Format* tab, and choose to use Word as your e-mail editor.

If you don't want to involve Word, you can launch the *Character Map* accessory by entering CHARMAP in the *Start* menu's *Run*



YOU CAN USE THE *Character Map* feature to copy special characters into your e-mail messages.

dialog. The *Character Map* dialog lets you copy any character to the Clipboard and paste it into your e-mail. In addition, when you select a character, it will show you the keystrokes to create it (for example, Alt-0252 for ü). This means that you hold down the Alt key, then tap out 0-2-5-2 on the numeric keypad (not the top-row numbers) and then release Alt.—NJR

Holding down Shift when clicking on the *File* menu in Word or Excel subtly changes the menu.

I just switched to Outlook 2003, and I miss a feature I depended on in Outlook Express.

Move Numbers within Filenames

I have a collection of audio books stored as MP3 files. The books are organized into folders, with tracks named in the format BookTitle_001.mp3, BookTitle_002.mp3, and so on. I just purchased a Cambridge

and passes each in turn as the variable %v into the command after the DO keyword. There is a second FOR command, which parses each passed folder name into three tokens: the explicitly defined %i and the additional %j and %k, breaking the name at the delimiter characters underscore (_) and

vidually and skipping the ones I don't want. Is there a way to tell Outlook to retrieve mail from multiple accounts with a single command—but only from the accounts I want?

ALAN WATKINS

```
C:\WINNT\system32\cmd.exe
G:\PC Magazine\pcmedit\solutions\user-to-user\2303\fortest>echo RENAME "BookTitle_001.doc" "001_BookTitle.doc"
RENAME "BookTitle_001.doc" "001_BookTitle.doc"
G:\PC Magazine\pcmedit\solutions\user-to-user\2303\fortest>FOR /F "tokens=1-3 delims=_" %i IN ("BookTitle_002.doc") DO echo RENAME "BookTitle_002.doc" "%j_%i.%k"
G:\PC Magazine\pcmedit\solutions\user-to-user\2303\fortest>echo RENAME "BookTitle_002.doc" "002_BookTitle.doc"
RENAME "BookTitle_002.doc" "002_BookTitle.doc"
G:\PC Magazine\pcmedit\solutions\user-to-user\2303\fortest>FOR /F "tokens=1-3 delims=_" %i IN ("BookTitle_003.doc") DO echo RENAME "BookTitle_003.doc" "%j_%i.%k"
G:\PC Magazine\pcmedit\solutions\user-to-user\2303\fortest>echo RENAME "BookTitle_003.doc" "003_BookTitle.doc"
RENAME "BookTitle_003.doc" "003_BookTitle.doc"
```

BEFORE YOU DO ANY batch renaming of files, you may want to insert *ECHO* into the command so you can see what will happen before any changes are made.

SoundWorks CD radio that plays MP3s, but the radio only looks at the first eight characters of a filename to determine the order of play. The book titles are all longer than eight characters, so the radio plays tracks in random order. That's okay for music but impossible for a book. Is there a utility or method to help me batch rename all the book files to put the track numbers at the front?

LAURIE PICARD

Assuming you're running Windows 2000 or XP, you can do this at the command prompt with a single command. Navigate to the folder that contains your chapter files and carefully enter (or copy) this command:

```
FOR %v IN (*.mp3) DO FOR /F
"tokens=1-3 delims=_" %i IN ("%v")
DO RENAME "%v" "%j_%i.%k"
```

The initial FOR command selects all files that match the file specification *.mp3

period (.). It then builds new filenames with the numeric portion first and renames the files, precisely as you requested. For example, Hamlet_012.mp3 is divided into *Hamlet*, *012*, and *mp3* and reassembled as *012_Hamlet.mp3*.

If you want to observe what this command will do before actually renaming the files, simply insert the command ECHO before the RENAME command. The modified command line will display the rename commands that would be executed without actually making any changes, as the screen shot shows.—*NJR*

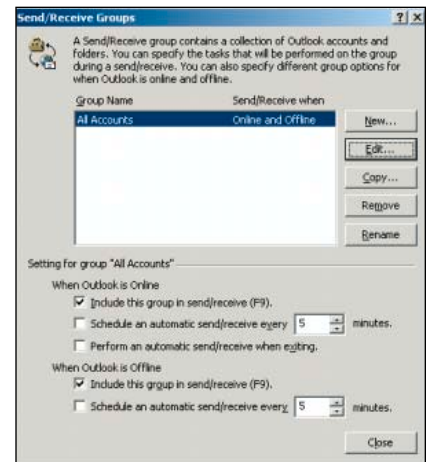
Retrieve Mail from Only Some Accounts

I've just switched to Outlook 2003 and badly miss a feature I depended on in Outlook Express. I have multiple e-mail accounts, and there are times when I want to retrieve mail from some but not all of them for days at a time. In Outlook Express, I could set each account to retrieve or not simply by going to the account properties, choosing the *General* tab, and checking or unchecking the box labeled *Include this account when receiving mail or synchronizing*.

I can't find an equivalent choice in Outlook, other than giving the *Send/Receive* command for each account indi-

The same option is available for each account in Outlook 2003 (and Outlook 2002), but it's in a different place. To find the check box you need, choose *Tools | Options*, the *Mail Setup* tab, and then the *Send/Receive* button to open the *Send/Receive Groups* dialog box. By default, Outlook creates one group called *All Accounts*. Take a moment to look at the setting choices on the bottom of the dialog box. In particular, note the choice named *Include this group in send/receive (F9)*.

With *All Accounts* highlighted, choose the *Edit* button to see the list of individual accounts in the group. For each account you want to exclude from the *Send/Receive* command, click on the account and remove the check from the check box labeled *Include the selected account in this group*. Then choose *OK* then *Close*. To include the account later, repeat the steps to select the



YOU CAN CHOOSE which e-mail accounts should be included when doing a *Send/Receive* in Outlook.

check box. You might also want to experiment with creating multiple groups and then including or excluding the groups as necessary, using the *Include this group in send/receive* check box.—*M. David Stone*

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Can e-mail survive?

Last year was not a good year for e-mail. In spring 2003, the steady flow of unsolicited and unwanted messages reached a tipping point. According to Postini, a California company whose e-mail-filtering service processes 150 to 200 million messages a day, spam finally accounted for more than half of all e-mail traffic. Then, in August, the SoBig-F virus hit the Net, rapidly spreading via a torrent of e-mail messages. New York-based MessageLabs, which runs a service similar to Postini's, trapped more than a million SoBig messages before the outbreak was 24 hours old, calling it the fastest-spreading e-mail virus on record.

It was the exclamation point on the gradual rise of mass-mailing viruses. This year, MessageLabs says, the ratio of virus-infected messages to other e-mail traffic increased by nearly 85 percent. As if all those SoBig messages weren't annoying enough, it was soon apparent that the virus was reprogramming PCs to serve as "open relays," giving spammers still more launchpads for their anonymous attacks. MessageLabs claims that more than 66 percent of all spam is now sent using systems commandeered by SoBig or MiMail, a similar worm.

YOU'VE GOT TOO MUCH MAIL

E-mail didn't need a year like this. Even without growing spam and virus problems, it was threatening to buckle under its own weight. E-mail users, particularly within businesses, have developed a fixation with the medium. For many, e-mail has all but replaced the telephone. With more mail, it becomes far easier to miss important messages and details. According to a recent study by Ferris Research, a San Francisco firm that follows the messaging market, users waste an hour each week managing their e-mail. And only 9 minutes of that hour are related to spam and viruses.

By the end of 2003, people were beginning to wonder whether e-mail was worth the hassle. In a recent report from the Pew Internet and American Life Project, 60 percent of those surveyed said that spam has reduced their e-mail use "in a significant way."

Everyday consumers are not the only ones changing their habits. Even businesses as large as General Motors—which employs 340,000 people worldwide—are slowly moving away from e-mail. "We've seen a trend back toward voice mail," says Tony Scott, GM's CTO for information systems and services. "[People] know that urgent e-mail messages can get lost in all the spam."

The kicker comes from a recent study run by InsightExpress, an online market research firm based in Stamford, Connecticut. 42 percent of the 500 American small businesses it surveyed said they would actually consider abandoning e-mail for business correspondence if the spam situation worsens.

CURBING THE JUNK

In early December, Congress passed the first federal law designed to regulate junk e-mail, the Controlling the Assault of Non-Solicited Pornography and Marketing Act of 2003, better known as CAN-SPAM. CAN-SPAM is certainly an improvement over the hodgepodge of state laws already in place. And it may curb spam sent by compa-

BY CADE METZ

ILLUSTRATIONS BY ALEX NABAUM

Facing increasing threats from spam, viruses, and outdated protocols, e-mail is crumbling under its own weight. Here's what you need to know to survive in today's e-mail environment.

REVIEWED IN THIS STORY

- 68 **Desktop Clients**
- 71 **Web Mail**
- 74 **Mobile Mail**
- 76 **Utilities**
- 66 **The Problem with Protocols**
- 70 **Scorecard**
- 72 **Aggregate**
- 79 **Antispam Filters**
- 82 **Antispam Whitelisting Apps**
- 85 **Mail Servers**

nies and individuals here in the States. But in all likelihood it won't put a dent in the spam you actually receive—let alone the plethora of other useless messages flooding your in-box. According to Postini's latest statistics, half the spam sent to American in-boxes originates with foreign servers. CAN-SPAM will have little effect (if any) on spam sent from overseas.

"You can get a conviction in absentia, but that really doesn't help," says Andrew Serwin, an attorney at the national law firm of Foley & Lardner who recently spoke before the House committee that proposed the new law. CAN-SPAM will probably just result in a larger percentage of spam from foreign countries.

Legislation won't solve our problems. If e-mail is to survive, we have to make significant changes to e-mail technology. We need better clients, better antivirus solutions. New apps like Stata Labs' Bloomba and Microsoft Outlook 2003 are steps in the right direction, but they provide little more than marginal improvement. And antivirus developers have become remarkably efficient, though SoBig showed that their software is still very susceptible to mass-mailing techniques. More than anything else, we need a far more effective way of stopping spam.

Not that today's antispam tools are useless. Many can stop a good portion of the junk mail streaming into your in-box, typically using some sort of intelligent filtering. But they can't stop it all. Spammers change their tactics just as quickly as the antispam vendors improve their filters. And there's always the danger that their filters will block important, legitimate messages. Spam looks too much like regular mail to be stopped by filters alone.

SETTING NEW STANDARDS

Unfortunately, the best defense may be to overhaul e-mail itself. The standards underpinning our e-mail infrastructure are ripe for exploitation (see the sidebar "The Problem with Protocols" below). Anyone can mail anyone else with relative ease. Anyone can ask a distant open relay to send massive amounts of mail, hiding where the mail truly originated. And anyone can forge almost every part of a message header. Spammers are notorious for *spoofing* the information inside an e-mail. It's not just a way of getting around antispam filters. If they can convince you a message originates from a Web site where you have an account—PayPal or eBay, for example—they can dupe you into opening the message. Worse, some of these messages have been so convincing that they've tricked people into giving up their credit card numbers and personal info, a scam popularly known as *phishing*.

Some e-mail experts advocate a new system where no one can send a message without paying a small fee. Junk paper mail isn't such a large problem, they argue, because it costs so much more to reach each recipient. What if everyone had to pay a penny for each e-mail sent, asks Jeffrey Stanton, a professor at Syracuse University's School of Information Studies? "You and I would still exchange messages, but spammers would stop and think about all the millions and millions of pennies they'd have to spend."

Such a system might work: So few people respond to junk e-mail, it's not effective unless it's sent in enormous quantities. But a system of tracking all e-mail and collecting money might be impractical and would be difficult to put in place.

the problem with protocols

Prior to its explosive growth in the early nineties, e-mail was pretty much limited to a collegial community of academic and government researchers. And it operated on very simple standards suitable to these communities. The simplicity of the e-mail protocols allowed Internet e-mail to be astoundingly scalable. Unfortunately, this simplicity has also made the current e-mail structure easy to abuse.

The problem is truly fundamental: The protocols in widespread use lack crucial features needed to make e-mail more trustworthy. When you compose a message and send it over the Internet, the message is routed to its destination by

one or more MTAs (message transfer agents)—servers that communicate via SMTP (Simple Mail Transfer Protocol).

The contents of an SMTP "conversation" are straightforward. The sender essentially provides an introduction and passes along the contents of a message—ASCII text with some simple headers. Non-ASCII characters and attached files are converted into ASCII and appended onto the message using Multipurpose Internet Mail Extensions (MIME) encoding.

This passing of data from server to server is full of vulnerabilities. For starters, the "from" address in an e-mail is just text; it's trivial for someone to make the e-mail look as if it came from somewhere else. Then there

is the problem with SMTP servers that aren't configured securely. These can unknowingly act as open relays, automatically forwarding any message they receive, so a spammer anywhere on the Internet can exploit them to send huge volumes of e-mail on his behalf. Most businesses and ISPs today therefore restrict relaying to those users who are known to be local to their networks or who can establish their identities when roaming using a technique called SMTP authentication.

Spamming isn't the only threat, either. Security and privacy are a major concern: SMTP, POP, and IMAP all transmit e-mail unencrypted, so snoopers can easily observe and potentially even modify

the contents of your messages. Technologies like PGP (Pretty Good Privacy) and S/MIME (Secure MIME) can encrypt messages to help protect them from observation or alteration, but such technologies require correspondents to exchange keys—typically a cumbersome process. Meanwhile, e-mail servers are vulnerable to more prosaic but still problematic DoS (denial-of-service) and mail-bombing attacks, in which they are simply flooded with requests in an attempt to disrupt normal operations.

Is there any hope for the future? Groups such as the IRTF (Internet Research Task Force) are working on countermeasures for such abuses, but the challenge is

A second, similar option would require payment in CPU cycles. "Let's say you have to compute a very complex algorithm in order to send an e-mail, chewing up a good number of CPU cycles to do so," says Eric Allman, the author of Sendmail, the Internet's first mail server. "If you were sending a hundred messages a day, you wouldn't notice it. But if you were a spammer sending a million messages an hour, you would."

Most likely, the industry will favor a system built around e-mail authentication. This would ensure that every e-mail really comes from where it claims to come from. A variety of authentication schemes have already been proposed, including a new standard known as SMTPi, SMTP over SSL, Reverse MX authentication, and Yahoo!'s software solution called Domain Keys.

Meanwhile, several organizations have introduced other schemes for measuring sender reputation. IronPort's Bond-Sender program, for example, requires senders to put up bonds ensuring they won't send spam. In return, ISPs and others won't block their messages.

The problem is getting the entire e-mail world to agree on a single system and implement it. And in the context of adopting new standards, the computer industry rarely moves quickly. A new e-mail system is years away, not months.

SAVING E-MAIL

In the meantime, there's a very real danger that the importance of e-mail will fade. People not only have phones and voice mail to fall back on, they also have instant messaging, which in some

ways is a more efficient form of e-mail (as discussed in "IM Everywhere," November 11, 2003). According to research firm IDC, more than 170 million people now have IM accounts, and the medium is becoming increasingly popular with business users, who now account for nearly a third of all IM traffic.

It's not inconceivable that people will turn away from their overloaded mail in-boxes. "When spam became such a huge problem in the Usenet newsgroups, people left them and moved to more restrictive interest groups," says Postini founder Scott Petry. "I don't want it to, but e-mail could go the same way."

On the other hand, e-mail is far more important to our everyday lives than Usenet ever was. It may be the most widely used computer application on the planet, and it's now an integral part of all but a small minority of businesses. According to a recent study commissioned by Evergreen Assurance, a Maryland company that helps businesses keep their e-mail systems and other apps up and running, nearly 90 percent of companies conduct business transactions via e-mail, and nearly 70 percent say e-mail is tied to their means of generating revenue.

2003 was a rough year for e-mail, and without the right apps this year could be worse. In the following pages we review more than 40 e-mail products, from clients that help you keep your in-box clutter-free and organized to Web-based services that let you access e-mail from anywhere, spam blockers that help you stop the junk before it reaches your in-box, and mail servers that try to make the whole process more manageable—all the tools you'll need to tackle modern e-mail problems.

daunting. Even with the promise of new technical approaches, the implementation of new standards will take a lot of time and effort because of the global nature of e-mail. And because e-mail is already built into so many applications, implementing a

new standard could "break" a lot of systems.

Consider the case of IPv6, a newer version of the fundamental Internet Protocol that is designed to keep up with the Internet's explosive growth. Version 4, developed more than two decades ago, is

currently in use; Version 6 was an experimental protocol not widely deployed. The IPv6 standard was ratified in 2000, but it will be years more before IPv6 is in widespread use.

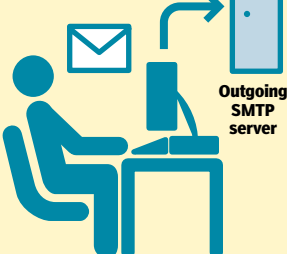
Realistically, we're looking at years before new standards are fully designed, more years

before there is widespread agreement on which protocols to use, and even more time before they are sufficiently implemented. We can only hope that economic urgency will drive the development of tools that hold back the rising tide of abuse.—*John Clyman*

SUBVERTING THE STANDARDS

LEGITIMATE E-MAIL SENDER:

A legitimate message originates on a computer that is connected to an SMTP server, which is typically operated by the user's ISP or company. The SMTP server authenticates the user, accepts the message, and sends the data to the receiving SMTP server.



Because open-relay servers don't use authentication, spammers can use these servers to send messages with fake addresses. This is why you can't easily trace or reply to most spam.

WORMS AND VIRUSES: Rather than sending from a single source, spammers instruct PCs infected with worms to do their bidding, without the PC owners' knowledge. A worm installs an SMTP server on a system. Because this server is sending mail from a legitimate domain, messages are delivered to the receiving SMTP servers with relative ease.

CLUTTERED IN-BOX: E-mail messages are delivered to an incoming SMTP server and then are passed on to a mail server and eventually downloaded by a recipient's e-mail client. Without an authentication system in place, most spam winds up in users' in-boxes.

E-MAIL CLIENTS

>desktop

Chances are your system already has at least one of Microsoft's clients installed. But there are a various competitors, some of which are worth checking out.



ALL REVIEWS BY RUSSELL GLITMAN

The Bat! 2.0

\$35 direct. Ritlabs S.R.L., www.ritlabs.com. OVERALL RATING: ●●●●●

Unfortunately, the most interesting thing about The Bat! is its name. Although it does have a few winning features, the program never really takes flight.

Overly cute and at times confusing, The Bat! has some features whose purposes are not immediately evident (for example, the SmartBat feature is a notepad) and others that are more annoying than clever (a new mail ticker runs by default, scrolling message information). And while we are glad The Bat! includes a scheduler, adding appointments is unnecessarily complicated. Further complicating matters, the help files have been poorly translated from Moldovan.

The program's address book is by far the most comprehensive of any here. You can store digital-certificate information and specify preferred mail formats for various contacts. The address book also includes an extensive list of Certificate Authorities, so you can easily create Certificate Signing Requests to obtain or renew encryption keys.

The Bat! places a lot of emphasis on secure e-mail features. For example, it has built-in support for PGP and S/MIME. Decrypting e-mail and generating PGP keys are very intuitive processes invoked via the Tools menu.

In terms of stopping spam, though, The Bat! has minimal options. You can mark mail as junk and easily route it to

the trash folder. But whitelists and blacklists alone aren't sufficient spam protection. If you decide to take The Bat! out for a spin, you will need third-party tools. The Bat! at least recognizes this and includes a plug-in manager to help you add and configure spam-blocking and anti-virus utilities.

Bloomba 1.0

\$59.95 direct. Stata Labs, www.statalabs.com.

●●●●●

Bloomba 1.0 isn't just your run-of-the-mill e-mail client; it's specifically designed for people who are overwhelmed by the amount of e-mail they receive. To help you work more efficiently, the application places more emphasis than competing products on search capabilities. It also includes decent spam protection to keep unnecessary clutter out of the way.

The advantage of a good search feature is twofold. First, and most obvious, you can quickly locate messages—a feat if you have an in-box with thousands of messages. Bloomba achieves this by indexing your incoming mail (header info, message body, attachments, folder, and read and filed status) as it arrives. You can, for example, search for a message that arrived six months ago and included a Word document that discussed J.D. Salinger. The second advantage is that

with reliable searching, you don't have to rely as heavily on a time-consuming hierarchical folder system for organizing messages.

To curb spam, Bloomba includes an integrated version of Stata Labs' SAproxy Pro 2.0 (reviewed in the "Spam Blockers" section, page 79), which is built on the open-source SpamAssassin. Bloomba also lets you create whitelists and blacklists of domains, e-mail addresses, and keywords. And as with other clients, you can turn off the automatic display of images and videos in messages.

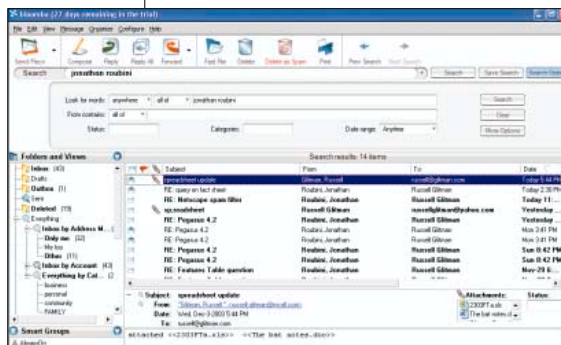
Another interesting feature, unique to Bloomba, is a built-in RSS reader. RSS feeds provide a wire-service-like news stream straight to your desktop or, in this case, your mail client.

Eudora 6.0

\$49.95 direct. Qualcomm Inc., www.eudora.com.

●●●●●

Despite Microsoft's apparent ownership of the e-mail client market, Eudora has remained a visible player. The latest version, Eudora 6.0, has some handy features and is



Bloomba takes a different approach to organizing your in-box, putting more emphasis on a good search tool and less on folder structure.

an extraordinarily customizable program.

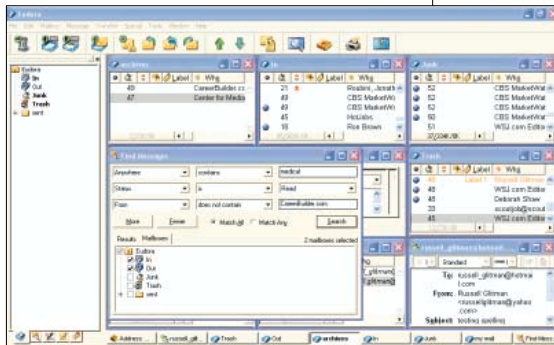
Eudora's interface is one of the most intuitive in this roundup. It offers multiple ways to access common tasks such as creating mail and maintaining an address book. And the interface can be shaped to suit your needs. For example, to add floating toolbars, you simply drag and

Our contributors: **Cade Metz** is a senior writer at *PC Magazine*. **John Clyman**, **Richard V. Dragan**, and **Edward Mendelson** are contributing editors of the magazine, and **Russell Glitman** is a freelance writer. Associate editors **Matthew P. Graven** and **Sean Carroll** and PC Magazine Labs project leaders **Jonathan Roubini** and **Neil J. Rubenking** were in charge of this story.

drop icons from an extensive customization menu.

Eudora makes a clear effort to simplify data to aid your efficiency. The address book lets you sort entries based on more than 25 criteria. (One criticism here is that the address book doesn't have a save option. You have to click on another tool to be prompted to save, a point that isn't immediately obvious.) A fantastic preferences menu lets you configure settings for more than 30 features ranging from common mail functions such as alerts and junk-mail filters to the unique Mood Watch feature, which flags potentially offensive content in your outgoing e-mail.

Like Outlook 2003, Eudora uses spam-filtering technology to stop junk before it reaches your in-box. Using the default settings on our spam-filtering tests, Eudora did relatively poorly. While it let



Eudora 6.0 is all about simplicity, offering an extremely intuitive interface and a great deal of customization options.

through more spam messages than we would like, we were even more bothered that it blocked a significant number of legitimate messages. Besides the paid edition we tested, Qualcomm offers an ad-sponsored version sans Spam Watch and tech support, and a free light version that offers only basic e-mail.

Microsoft Outlook 2003

Standalone version, \$109 list. Microsoft Corp., www.microsoft.com. ●●●●●



By far the most mature e-mail client in this roundup, Microsoft Outlook 2003 offers a slew of options and features that will appeal to both business and personal users. Outlook also aptly serves as a personal information manager, with first-rate calendar and address book features.

Meanwhile, tight integration with Microsoft Office 2003 makes it an invaluable collaboration tool.

The latest version of Outlook has an improved multipane view. Tabs let you roll up (or clump) messages by sender name; day, month, or week received; message size; and so on. And perhaps the most useful little gem new

in Outlook 2003: If you are working in another application, a small window appears when you receive a new message. It displays the subject and first line of the message, along with options to flag, delete, or open the message (without having to switch over to Outlook), then fades out.

Outlook 2003 also boasts a revamped spam filter that does a much better job of blocking junk than Outlook 2002 did. Still, compared with the dedicated spam blockers in this story, Outlook 2003 was mediocre, rarely misidentifying good mail but missing a lot of our spam.

Other security features, such as blocking images and HTML, are easy to define. By default, remotely linked images in messages do not appear, but with a single click on an HTML message we could download images or change settings to permit image downloads from safe senders and trusted Web sites.

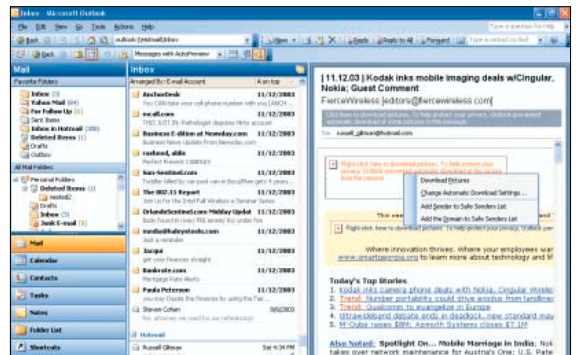
Some of Outlook's features could still stand improvement. For instance, we're growing tired of waiting for a better and faster search tool. But even with its shortcomings, Outlook 2003 is undoubtedly the king of e-mail clients.

Microsoft Outlook Express

Free with Windows XP. Microsoft Corp., www.microsoft.com. ●●●●●

Don't mistake Microsoft Outlook Express for a light version of the Outlook client; it's an adequate though generally basic e-mail client that simply has a similar moniker. It has minimal privacy options, no built-in spam protection, and limited opportunities for customization.

The multipaned interface is simple enough, with standard elements like a



Outlook 2003 is the most robust client in this roundup, offering first-rate calendar and address book tools and an efficient interface.

folder list for organizing messages, a contacts list, and a preview pane you can toggle on and off. Although the address book is a bit bare-bones, adding contacts is quite easy.

You can create basic message filters by selecting from a series of 12 conditions (such as when the message body contains a particular word) and 12 actions (like moving the message to a specified folder). For example, you can have any messages that mention Britney Spears automatically moved to Deleted Items. You can also use an incoming message as the basis for a new rule.

Another tab in the Message Rules dialog lets you block a sender from the Message menu. This essentially creates a blacklist that automatically deletes messages from blocked senders. After you block an address, Outlook Express scans your in-box and delete messages previously received from the newly blocked sender. This is a nice feature, but it should be added as an option when you right-click on a message.

Although Outlook Express is fairly sparse, some interesting features are sprinkled throughout. The Watch/Ignore option lets you tag an e-mail message or newsgroup discussion to monitor a thread. The client also includes five encryption preferences and support for digital signatures.

Netscape 7.1 Mail

Free. Netscape Communications Corp., www.netscape.com. ●●●●●

Netscape Mail is designed not so much to be an e-mail client as to be part of a bigger package—a tightly integrated package

that includes the Web browser Netscape Navigator and AOL Instant Messenger (AIM). We would recommend it only to those planning to use Navigator as their default browser.

Netscape Mail's well-organized interface looks like Navigator and shares the same Preferences menu. AIM is also readily accessible from Netscape Mail. Overall, using this product is a very good approach if you're willing to adopt an all-Netscape/AIM life.

As an e-mail client, Netscape Mail is at best adequate and at worst problematic. The junk-mail setting is hard to figure out. On our spam-filtering tests, it simply cataloged all messages as junk. Even after we designated some specific senders as not junk senders, future messages from them continued to be categorized as junk. Other spam options are fairly limited.

To reduce your chances of getting hit by a virus, you can opt not to display HTML—but the setting is global and applies to all messages in your in-box. Other clients let you do this on a per-message basis by clicking on a message body or header, a much better approach.

We were also unimpressed by Netscape Mail's search feature, which is not as precise as we would like. For example, we performed a search on a keyword and indicated that the word appeared in body text. The results included a message that had a blank body; instead, the keyword was in the subject line. While this may seem like a minor problem, it's indicative of the program's need for revamping.

Pegasus Mail 4.12

Free. David Harris, www.pmail.com. ●●●●●

The clunky, no-frills interface of Pegasus Mail is reminiscent of an e-mail client of the mid-nineties. This free program frequently feels awkward, with underdeveloped features and a confusing interface.

Pegasus's small icons are not labeled in certain modes—such as when you are composing a new message. The send button is tiny and hard to find, and it actually disappears when you try to attach a file.

Pegasus isn't all bad, though. When composing messages, you can include message annotations and signature files that support Web links and images. And a handy series of check boxes lets you

select options such as return receipt, copy to sent folder, and encrypt.

The address book provides only minimal features. Once again feeling outdated, Pegasus offers no fields for cell-phone numbers or home e-mail addresses. You can include images with address book records, but Pegasus doesn't automatically resize images, and this can result in records being inaccessible. The search feature is accurate, and you can search across multiple folders. But you can't search within attachments.

Pegasus has an impressive set of customizable rules for filtering incoming messages. The program also has built-in spam protection, though in testing it failed to block most of our spam.

Like Microsoft Outlook 2003, Pegasus does not automatically download remotely linked items, such as HTML graphics, in e-mail. You can selectively enable this ability for each message—better than the all-or-nothing approach in the other free client, Netscape 7.1 Mail. And the Selective Download lets you preview mail in your POP3 accounts before downloading them locally.

SCORECARD

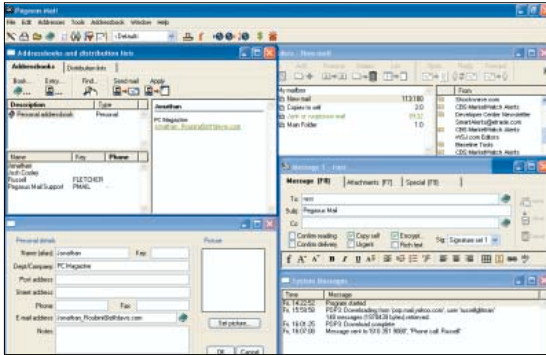


Traditional e-mail clients and their Web-based counterparts serve similar purposes, so we hold both to the same standards. For **installation and setup**, we look at tasks such as installing the software (if applicable), creating user accounts, and setting up access to multiple external POP/IMAP accounts. The **interface** rating reflects the client's look and feel, its general usability, and (for Web-based clients)

whether banner ads are displayed. For **mail creation and editing**, we've tested composition tools and options like the spell-checker and thesaurus. **Message management** involves such features as mail folders, custom rules, and search capabilities. Under **contact management** we evaluate personal and shared address book features and mailing-list capabilities. For **spam handling**, we rate each product based on test performance and the ability to customize spam filters.

	Installation and setup	Interface	Mail creation and editing	Message management	Contact management	Spam handling overall	Spam accuracy	Legitimate mail blocked	Spam allowed	OVERALL
DESKTOP CLIENTS										
The Bat! 2.0	●●●●	●●	●●●	●●●	●●●●	●●	N/A*	N/A*	N/A*	●●
Bloomba 1.0	●●●	●●●●	●●●●	●●●●●	●●●	●●●●	●●●●	1.6%	11.0%	●●●●
Eudora 6.0	●●●●●	●●●●	●●●●	●●●●	●●●●	●●	●	14.3%	10.6%	●●●●
Microsoft Outlook 2003	●●●●	●●●●●	●●●●●	●●	●●●●	●●●●	●●	3.2%	31.1%	●●●●●
Microsoft Outlook Express	●●●	●●●	●●	●●	●●	●	N/A**	N/A**	N/A**	●●●
Netscape 7.1 Mail	●●●	●●●●	●●●●	●●●	●●●	●	●	0%	100%	●●
Pegasus Mail 4.12	●●●●	●●	●●●	●●●	●●	●●	●●	4.8%	69.5%	●●
PocoMail 3.03	●●●●	●●●●	●●●●	●●●●	●●●	●	●	36.5%	36.4%	●●●
WEB-BASED CLIENTS										
Mailblocks Extended Service	●●●●	●●●●	●●●●	●●●●	●●●	●●●	N/A*	N/A*	N/A*	●●●●
Mail.com Business Select	●●●●	●●●	●●●	●●●	●●●	●●	●	30.2%	55.8%	●●●
MSN Hotmail	●●●●●	●●●●	●●●●	●●●	●●●	●●●●	●●●●●	1.6%	8.6%	●●●●
Oddpost	●●●●●	●●●●	●●●●	●●●	●●●	●●●●	●●●●●	1.6%	7.5%	●●●●
Yahoo! Mail Plus	●●●●	●●●	●●●	●●●	●●●	●●	●●	7.9%	17.9%	●●●

RED denotes Editors' Choice. N/A*—Not applicable: This program has a whitelisting feature but does not support filtering. N/A**—Not applicable: Outlook Express does not support filtering or whitelisting.



Pegasus Mail 4.12 boasts a clunky, bare-bones interface along with features that are awkward and sometimes downright confusing.

the message body, and tabbed mailboxes make it easy to organize messages and manage multiple accounts. All these features can be overwhelming. Fortunately, there's the Mini Poco-

The search tool, which relies on a series of context-aware drop-down options, is fairly intuitive. But PocoMail lacks Boolean search capabilities and the ability to search in attachments.

On our spam-blocking tests, PocoMail did miserably, letting through more than a third of the spam and, more disturbing, deleting more than a third of the legitimate messages, mistaking them for spam.

The relatively unknown PocoMail 3.03 can't compete with Outlook 2003. But it has some unique features Microsoft could learn from.

PocoMail 3.03

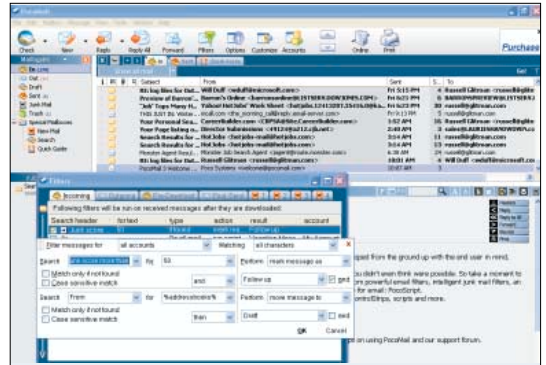
\$34.95 direct; PocoMail Portable Edition, \$39.95.
PocoSystems Inc., www.pocomail.com. ●●●●●

Packed with easy-to-use mail management features and flexible security controls, PocoMail lets you focus on your e-mail instead of the e-mail client. It can't compete with Outlook 2003's breadth of features, but it does include some unique features even Microsoft could learn from.

The interface is well designed and highly customizable. Attachments are conveniently displayed in a pane next to

Console, which lets you switch to a simple interface that shows only the most important information, such as new messages.

Also noteworthy is PocoMail Portable Edition, which runs off of portable media, such as a USB key, letting you securely access your messages from most any PC. When you are back at your system, the device can be synchronized with your PocoMail desktop client.



web mail

Web-based mail has some serious advantages over traditional desktop clients. You can, for example, access multiple e-mail accounts from any PC.



ALL REVIEWS BY RICHARD V. DRAGAN

Mailblocks Extended Service

15MB storage, \$9.95 a year; 100MB, \$24.95 a year.
Mailblocks Inc., www.mailblocks.com. ●●●●●



With a clean, effective interface and an open approach to integrating external e-mail accounts, Mailblocks Extended Service is a well-rounded Web mail solution. The service aims high—and succeeds—as a Web-based mail solution suitable for the needs of both business and home users.

Mailblocks' ad-free interface consistently pleases, with clean graphics and well-thought-out page flow. JavaScript, judiciously used, speeds things up, and the rich-text editor includes a WYSIWYG pop-up that displays all available colors. Also impressive, users can get 100MB of storage

for \$24.95; at that price, many of its competitors offer about 25MB.

For those who want to use the service to check multiple e-mail accounts, Mailblocks can access POP/IMAP accounts, as well as AOL, Hotmail, and Yahoo! Mail. External mail is conveniently organized into dedicated folders for each account. Additionally, Mailblocks can scan each message from each account to build an address list—a real time-saver.

Mailblocks uses a challenge/response protocol as its primary spam defense. Before you see mail from any unknown source, Mailblocks optionally issues an e-mail “challenge” to the sender; the sender must then type in a graphically displayed code before the message is delivered to your in-box. After the re-

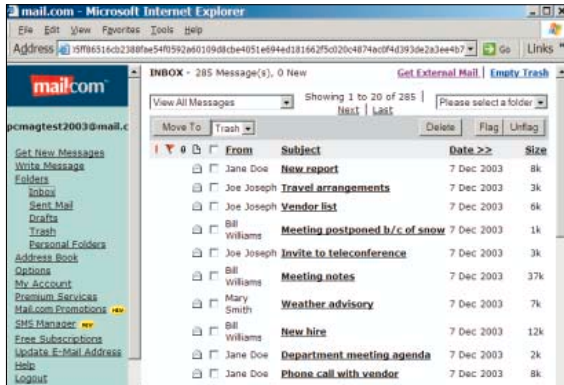
sponse is accepted, that sender won't be challenged again. Interestingly, the challenge process is global. If any Mailblocks user accepts a sender, that sender will normally not be challenged again by another Mailblocks user. Mailblocks also offers “tracking” accounts—disposable e-mail addresses to help users avoid spam.

Mail.com Business Select

50MB storage, \$24.99 a year. Net2Phone Inc., www.mail.com. ●●●●●

Despite its minimal interface, Mail.com's premium Business Select service offers a reasonable selection of features. And unlike Hotmail and Yahoo! Mail, Mail.com maintains a dedicated infrastructure for premium users (to provide better performance than you get with Mail.com's free service, which includes banner ads).

For \$24.99 per year, you get 50MB of e-mail space, support for five external POP accounts, and, perhaps most important, no ads beyond the log-on screen. Another welcome touch: Users can choose among several dozen domains, including domains geared toward specific occupations (such as *consultant*



Although it is sparse-looking, Mail.com Business Select has no banner ads once you log on.

.com, lawyer.com, and teacher.com). Still, the bare-bones approach leaves you without certain features, such as basic searching abilities.

On the plus side, Mail.com offers a downloadable system tray utility (for

Windows users) that lets you know when new mail arrives and takes you to the in-box with one click. Optional SMS support (priced separately) lets you receive text messages on your pager or phone.

To help prevent junk-infested in-boxes, Mail.com runs a proprietary spam-filtering utility on its servers. One of the least effective spam filters we tested, it actually does more harm than good. Mail.com also provides an easily customizable "blocked senders" list, along with a dozen filter rules that automatically deal with incoming mail.

Mail.com is a Web site on the brink of some big changes. Although the vendor would not comment at press time, you can expect revamped premium services

soon. And though the current service is a bit short on personality and visual flare, it is a solid player worth keeping an eye on.

MSN Hotmail (with Extra Storage)

25MB storage, \$25.95 a year. Microsoft Corp., www.hotmail.com. ●●●●●

During our testing, MSN Hotmail was in the midst of the most significant redesign to date. Although there are still plenty of ads on the site, Microsoft has done its part to create a sleeker interface. The service offers a nicely organized and very effective Web mail interface that incorporates handy features like a Today tab that highlights new messages from known contacts. Though Hotmail suffers a reputation for being infested with spam, its spam filter did an impressive job on our tests, even outperforming some dedicated spam-filtering applications.

Getting up and running, Hotmail

aggregate

Web mail has a lot of advantages over traditional Windows desktop clients, most notably the ability to get mail from anywhere. These two free services focus on putting a Web face on your existing personal e-mail accounts.

FuseMail Personal is a good bet. It packs a host of features, including e-mail aggregation from popular e-mail services including AOL, MSN Hotmail, and Yahoo!, and from external POP accounts, plus basic message archiving.

A wizard lets you enter your accounts and passwords, and FuseMail does the rest, collecting mail and even filtering out junk via its spam engine, FuseFilter. We found the spam engine fairly sensitive; for example, it treated many forwarded messages as spam.

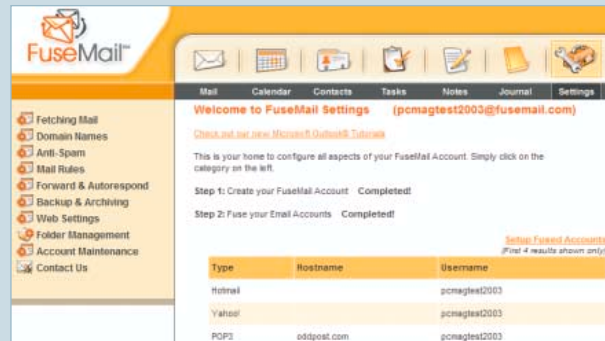
You can build a contact list

within FuseMail, too, though there is no import ability. Basic calendaring is available as well. We like being able to archive e-mail to disk, a feature not found on every premium service.

FuseMail isn't fancy, but it has a good, clean, usable interface and very few banner ads. The vendor plans to market group and enterprise editions of this software.

(FuseMail LLC, www.fusemail.com. ●●●●●)

Like FuseMail, **mail2web.com** lets you check almost any e-mail account from virtually anywhere. In ad hoc mode, you don't even need to register: Just enter your e-mail account and password. (This made us uneasy, but according to the privacy policy, passwords are never stored.) The service does its level best to ascertain server settings for Hotmail, Yahoo! Mail, and



Along with basic calendaring, spam filtering, and archiving, FuseMail collects mail from multiple accounts easily—all for free.

other popular mail services; you can also provide POP or IMAP settings manually.

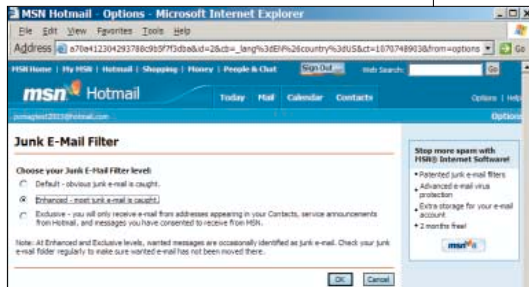
By registering and creating a free account with mail2web, you can store your e-mail server names and get a personal home page on the mail2web servers (including a picture, favorite news groups, and favorite links). The contact importer offers a handy ability to parse CSV files to find just the right fields for your address book. There is also a WAP version

of the e-mail client for accessing mail on WAP-enabled phones and PDAs.

Although mail2web.com does not provide all the functions of a premium service (there is no antispy filtering, for example), what it does it does very well. While you'll see a good many banner ads here, the visual design remains clean and even elegantly laid out. (SoftCom Technology Consulting Inc., www.mail2web.com. ●●●●●)—RVD

depends on Microsoft .NET Passport for logging users on, so you'll be signing up for both at the same time unless you already have a Passport log-on. Wizards help you set up access to external POP accounts. We like that messages can be color-coded by account (Yahoo! can do this as well).

Even with ads on every screen, Hotmail is arguably better designed and more streamlined than major rival Yahoo! Mail. Basic editing and searching of mail are smooth, and the rich-text editor is robust, with a spell-checker, a thesaurus, and a dictionary (via Encarta). The built-in spam filter has three settings: default, enhanced, and exclusive (which locks your e-mail to all but whitelisted contacts). You can further train the spam



Despite the fact that it includes banner ads, MSN Hotmail has a well-organized and very effective interface.

filtering by marking missed messages and sending them back to Microsoft.

Hotmail clearly benefits from being a part of the Microsoft family. You can use Microsoft Outlook and Outlook Express to access Hotmail via HTTP (instead of POP/IMAP), and address books can be imported from these programs as well.

Oddpost

50MB storage, \$30 a year. Oddpost Inc., www.oddpost.com. ●●●●●

While some companies treat Web-based e-mail as a lesser cousin of the desktop clients, Oddpost aims to be every bit as capable as a desktop client. It does achieve the fast and mature feel, but it still lacks a few features. For example, advanced filtering by rules won't be available until sometime this year. And the mailbox search feature is weak.

Oddpost has the most businesslike interface of the Web mail services in this roundup. And the interface, which uses some whiz-bang DHTML and JavaScript

(and requires Internet Explorer 5 or later), is truly impressive and looks like Outlook Express, with a traditional menu running atop the page—and no banner ads.

Configuring external POP accounts is easy, with a wizard that tests your connection settings on the fly. Oddpost accounts can also be accessed via IMAP, so you can use a regular Windows mail client such as Outlook or Eudora as well.

Spam control is built-in with a proprietary Bayesian filtering algorithm on Oddpost's servers. In testing, Oddpost did a very good job of detecting spam and valid messages. Like most spam blockers, Oddpost's filter did misidentify several newsletters as "probably spam." But with some training this quickly improved.

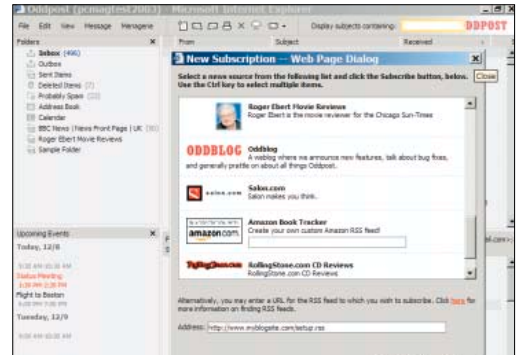
Oddpost offers more innovation than just its impressive interface. For example, strong RSS support lets you subscribe to news feeds or blogs. Like Yahoo!, Oddpost offers a calendar module with daily and weekly views available for appointments and other events. A monthly view was still under construction during our tests.

Yahoo! Mail Plus

25MB storage, \$29.99 a year. Yahoo! Inc., <http://mail.yahoo.com>. ●●●●●

Yahoo! Mail Plus offers an appealing range of basic e-mail features, along with some distinguished extras like a good calendar tool and trackers (disposable e-mail identities). Although it has the most banner ads among the sites in this roundup—even with the paid service—Yahoo! Mail remains a capable e-mail client.

Sending and receiving e-mail in Yahoo! is easy enough. You can quickly create messages with the solid rich-text editor and select contacts for messages. You can access up to five POP accounts; by default, all mail is downloaded into the main in-box. Yahoo! Mail helpfully color-codes messages according to which POP

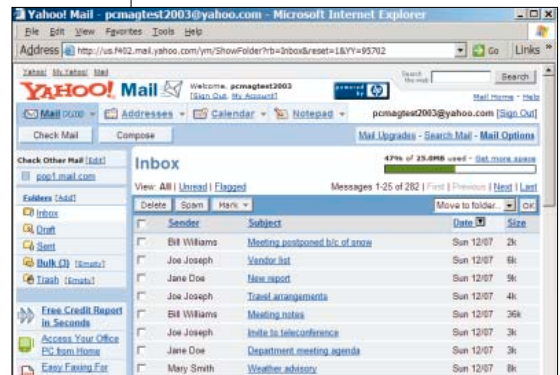


Oddpost has done an impressive job of creating a Web-based e-mail client that looks and feels like a desktop application.

account each of them gas come from.

With such a huge presence, Yahoo! has a lot of work fighting spammers and e-mail viruses. Besides its proprietary antispam software, SpamGuard Plus, Yahoo! licenses antivirus protection from Symantec on its servers. Beyond having Yahoo! Mail flag spam by default, you can define up to 50 filters to set conditions to spot potential trouble messages, and also to redirect messages to different folders. Using default settings, Yahoo! Mail did an average job of filtering spam. It will help but certainly won't keep your in-box spam-free.

Perhaps Yahoo!'s most notable feature is its calendar module, the most comprehensive of any Web mail client here. A notepad feature lets you write and store notes—meeting notes, for example—and optional services include PDA synchronization via Intellisync for Yahoo! (a free download), which works with Windows clients (like Outlook) and Palm devices.



Yahoo! Mail Plus does a lot more than just e-mail. It includes such useful tools as a calendar, an address book, a notepad, and more.

mobile mail

Don't like straying too far from your in-box? There are a lot of options for staying on top of your e-mail from anywhere you can get a cell-phone signal.



We tested five cell-phone plans and the WAP-enabled phones they use to serve you e-mail and Web sites. For those seeking a more robust solution, we looked at a few devices that offer PDA capabilities, wireless access, and more, as well as two dedicated mobile e-mail devices.

There are dozens of permutations of phone (or other mobile device) and service plan. We contacted major service vendors and requested a phone, a device, or both. Our only requirement was that everything had to work with personal (POP3) mail. While some of the services below also let you access your corporate mail, our filter left out the popular GoodLink package, which works solely with Microsoft Exchange.

The service and the device cannot be separated in evaluating performance, although both contribute to the overall experience. What you'll find in this section is a sampling of combinations—a snapshot of what's out there.

PHONES

AT&T subscribers can access e-mail using the **Nokia 6200** (\$49.99 with a contract), a compact phone that is oddly shaped and has an uncomfortable keyboard. While text messaging from the phone interface is fairly seamless, we weren't happy with the online experience offered by mMode (pay as you go, \$2.99 per month; 1MB of transfers, \$7.99). mMode, which connects you to the "mobile" Web, can be set to access your POP3 and IMAP accounts. Unfortunately, you often must jump through several pages before you can read or reply to e-mails.

We usually recommend that cell-phone users set up their mail via computer, on the service provider's Web site, but AT&T's site doesn't seem to offer all

the necessary features. We had to set up our POP3 mail through the phone; through the site, we could set up only from a set list of servers (like AT&T Worldnet and EarthLink).

AT&T also offers the Office Online service (\$2.99 a month, or \$4.99 a month with file-sharing service). This allows access to Lotus Domino and Microsoft Exchange corporate e-mail. (AT&T Wireless, www.attws.com. ●●●●●)

The smallest phone in our roundup, the **Siemens SL56** (\$249.99 with a two-year contract; price varies by state) offers e-mail functions both built into the phone and through Cingular Wireless's Web services (Wireless Internet Express: 1MB, \$6.99 per month). You can set the

phone to retrieve your mail directly or set a filter for it to download only e-mails smaller than a selected size. The phone supports both POP3 and IMAP, and it lets you set a general e-mail address to blind-copy automatically whenever you send out mail. Alternatively, you can use the phone to surf to the online mail account Cingular offers through "My Wireless Window." Here you can send and receive messages and have the service collect your external POP3 or IMAP mail.

Cingular offers an Outlook add-in called SyncNow, which lets you access your desktop's contacts and calendar. Unfortunately, unlike Sprint PCS, Cingular doesn't let you collect your corporate mail, though Xpress Mail, a service planned for later this year, will offer that feature. (Cingular Wireless, www.cingular.com. ●●●●●)

Sprint PCS's approach to e-mail using the **Samsung A600** phone (\$349.99, or \$199.99 with a two-year contract) is a bit different from that of the GSM providers

(AT&T, Cingular Wireless, and T-Mobile). To send or receive e-mail—or SMS messages—you connect to the Internet through the PCS Vision service (unlimited usage, \$15 a month). The A600 lets you upload pictures taken with the phone to Sprint's picture server; e-mail friends and they'll receive a link to the photos.

We particularly like the Business Connection feature. It runs on your desktop and gives you access to your mail, but it doesn't offer Web mail access. When using Business Connection, you can set it to connect to your corporate Domino, Exchange, or IMAP server.

Overall, the A600 has an excellent interface, with the easiest menus to use among these products. The connection from the phone to the server is secure; the drawback is the 128-character-long reply limit—about as long as this sentence. (Sprint PCS, www.sprintpcs.com. ●●●●●)

The **Motorola V300** (\$99 with a T-Mobile USA contract) has a very intuitive interface for sending and receiving e-mail via phone. With it, you can also take pictures and send them to your friends—and unlike with Sprint PCS, you can attach a picture to an e-mail message.

Unfortunately, you can't set the phone to collect POP3 e-mail directly. To access POP3 mail or your corporate mail, you need t-zones Pro (unlimited usage, \$9.99 a month). You can set up this service to collect from different POP3 accounts and even your Exchange or Notes mail.

If your company is running the Web mail client of either Exchange or Notes, T-Mobile can connect to it to retrieve your mail and calendar. If not, you can download an application, just as with Sprint PCS, to run on your computer and access corporate mail from your phone. The service works fine from a desktop, but we weren't impressed with the Web interface on the phone itself. (T-Mobile USA Inc., www.t-mobile.com. ●●●●●)

The **Audiovox CDM8900** (\$219.99 with a one-year contract) is a fairly compact flip phone for Verizon Wireless users. The menus are easy to navigate, and you can send e-mail using the built-in text messaging. You can also send out picture messages—and as with the T-Mobile phone, the images will be attached to the messages. Unfortunately, picture mail is sent with an @vzwpix.com address rather than the usual @vtext.com, so replying to



such a message will result in an “undeliverable e-mail” error.

For POP3 functions, you will need to access Verizon’s Get It Now service directly from the phone. Here you can get Verizon’s messaging application, Soda Pop Mail (\$2.99 a month). Once you download and install the app, you can set it up to collect your POP3 e-mail. You can select from a list of presets like Hotmail, Road Runner, and Yahoo!, or set it up with your own POP3 account. The application is easy to use but doesn’t support IMAP. Verizon Wireless does not offer any solution for collecting corporate mail from this phone. (Verizon Wireless, www.verizonwireless.com. ●●●●●)

OTHER DEVICES

Using your cell phone is a handy option, but it can be restrictive. If you’re looking for a device that can work as a phone but is designed for e-mail use, choose one of the many other mobile gadgets available.

The **RIM BlackBerry 7230** (\$399.99), from T-Mobile USA, is a fairly small and sleek-looking device dedicated to mobile mail: E-mail meets the pager. Its menus are very easy to navigate, thanks partly to the color screen, and the keyboard layout—the best here—is very comfortable.

E-mail is stored on the server (to a 50MB limit), and each message is pushed to the device on arrival. The device comes with its own e-mail address, though you can set it up to access your POP3, IMAP, and even Exchange and Notes servers. When replying to e-mails, though, you are allowed to use only one e-mail alias, and you should be aware that although you can choose your corporate e-mail, messages won’t be going through your corporate server when they’re sent. The service also comes with a junk filter, which you can set to keep possible junk mail on the server instead of having it sent to your device. (T-Mobile USA Inc., www.t-mobile.com. ●●●●●)

For the strength of Microsoft’s Pocket PC operating system along with wireless connectivity—and a very straightforward e-mail setup—look to Pocket PC 2002 Phone Edition. We tested the **Hitachi G1000** (\$499.99 with a two-year contract),

which lets you easily check your POP3 and IMAP e-mail accounts. Unlike most devices that use this software, the G1000 has an actual keyboard. It makes typing easier but also makes the device way too bulky.

You can collect your Sprint PCS mail or personal mail using the built-in e-mail software, or you can run Business Connect to access your corporate mail. (Currently, you can receive but not send SMS messages.) Business Connect offers more advanced functions. For example, you can access all the files on your desktop that you are sharing. Thanks to the advanced browser, you can actually view images; other files, such as Microsoft Word documents and PDF files, can be downloaded and opened directly on the device. (Sprint PCS, www.sprintpcs.com. ●●●●●)

If you are looking to sync seamlessly over the air to your corporate account but don’t want a full PDA, the **Motorola MPx200**, a phone that runs Microsoft Windows Mobile for Smartphone 2002, might be right for you (\$299.99; \$150 instant rebate with a two-year contract from AT&T). It’s bulkier than the average phone but has a nice color display, an easy-to-use menu system, easy POP3 mail setup, and the ability to run small applications and read from an SD or MMC card.

We accessed Exchange 2003 e-mail by syncing the phone over the air and had instant access to messages, contacts, and calendar—a step forward from trying to sync a traditional cellular phone. This also represents a definite advantage over running applications on your desktop to share your corporate mail, though it’s limited to companies running Exchange 2003, or Exchange 2000 with Mobile Information Server. And unfortunately you can have only one in-box set up at a time. (AT&T Wireless, www.attws.com. ●●●●●)

Much like the BlackBerry, the **T-Mobile Sidekick** (\$249) is a dedicated mobile e-mail device. The screen, which in normal mode covers the keyboard but can be flipped out, is more color-rich and de-

tailed than the Handspring Treo 600’s screen. The keyboard is roomy and easy to use. And in reading mode, you can scroll through e-mails and menus without having to flip open the screen.

The e-mail interface is easy to navigate. One drawback, however, is that the Sidekick gives you access only to the built-in account and three POP3 or IMAP accounts; you can’t get corporate mail on it.

The Sidekick can open Word and PDF attachments (though you can view their content only as plain text), play sound file attachments, and display images embedded in or attached to messages. (T-Mobile USA Inc., www.t-mobile.com. ●●●●●)

We looked at two ways to use the **Handspring Treo 600** PDA to collect mail. The Cingular plan (\$499.99 with a two-year contract) uses the Palm OS mail utility. It lets you set the number of kilobytes to download per message (you can download the full e-mail later). Unfortunately, though you can see that files are attached to messages, you can’t really do anything with them. Palm OS mail is also limited to POP3 and IMAP; there’s no corporate mail access. Sprint PCS also offers the Treo 600 (\$449.99 with a two-year contract), but it comes with the Palm version of Business Connect, which lets you collect personal and corporate mail. The features are similar to those of Business Connect’s mail collection agent, but with the Treo 600 the app is local, so you don’t have to deal with an Internet browser.

The Treo 600 is sleek and small, with a built-in keyboard. The keyboard is designed to avoid the accidental pressing of two keys at once, though some users might have occasional problems. (Cingular Wireless, www.cingular.com ●●●●●; Sprint PCS, www.sprintpcs.com ●●●●●.)—Jonathan Roubini



MORE ON THE WEB

For an in-depth comparison of the features these desktop and Web-based e-mail clients offer, visit

www.pcmag.com/email.

>utilities

Outlook 2003 may get our Editors' Choice, but that doesn't mean it's perfect. Here are some of our favorite add-ins that make Outlook even better.



Spam may be the worst of your e-mail problems, but every day brings reminders that your e-mail isn't working as hard for you as it could be. You need to be alerted to newly arriving mail and preserve old mail. You've got to compress file attachments for fast sending—and access attachments, even if your e-mail software decides they should be blocked. We've selected some of our favorite e-mail tools that help you do all this and more.

Unfortunately, as of press time the major tools for indexing messages are in flux, with new ones due imminently. Watch our pages for developments there.

Before you do anything else with your e-mail, back it up for safekeeping. **Email Saver Xe** (\$29 direct) can back up any combination of message files, address books, mail filters, signatures, stationery, and identity settings, and it does so either on demand or at scheduled intervals. The program supports nine popular e-mail clients, including Eudora, Microsoft Outlook, and Outlook Express, and it can also back up Internet Explorer favorites.

By default, the automatic scheduler preserves 2 older backups when making a new one, but the obsessive can keep up to 99. The program's only flaw is its lack of a keyboard interface; you can't use it without the mouse. (WinGuides Software, www.winguides.com/emailsaver. ●●●●●)

The best single source of Outlook add-ins is Sperry Software, creator of enhancements that you may not know you need until you try them. Prevent yourself from looking stupid by using **Attachment Forget-Me-Not** (\$14.95, ●●●●●), which scans outgoing messages for words like *attachment*, or any other terms you specify, and pops up a warning if you forgot to attach a file. **Auto Print** (\$24.95, ●●●●●) automatically prints—or sends to a fax program—any messages or attachments from specific senders or with specific subject lines, so you won't forget to print the grocery list your spouse e-mailed you.

Attachment Save (\$29.95, ●●●●●) provides similar automation for saving attachments of specific kinds. It can keep the paperclip icon on a message while removing the attachment and can even restore saved attachments to their messages.

Hide Fax Numbers (\$19.95, ●●●●●) unclutters Outlook's address book by not displaying both the fax listing and the e-mail address for each contact when you click the To... button to create an e-mail, but it leaves the fax addresses visible in the full address book. Other add-ins let you insert the date and time in a message or note with a keystroke of your choice, or automatically schedule reminder e-mails, or automatically add a specific blind-copy address to every e-mail you send. (Sperry Software Inc., www.sperrysoftware.com.)

One real annoyance is when you know you need an incoming EXE file or other attachment but Outlook's security settings insist on blocking it. **Attachment Options** (\$10) gives you full control of which file types Outlook will block and which one it will let you access. Simply go to Tools | Options, open the Attachment Security & Options tab, and select which blocked extensions to unblock. (Slovak Technical Services, www.slovaktech.com. ●●●●●)

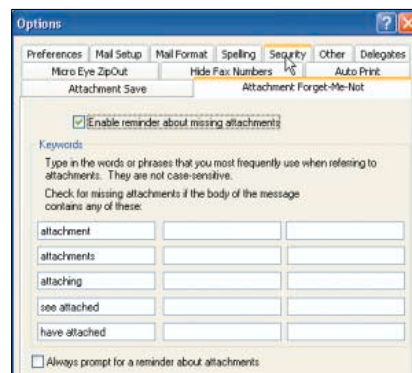
When you're sending attachments, you can speed your outgoing mail by installing **ZipOut 2003** (\$20). This Outlook add-in automatically compresses outgoing attachments as ZIP archives (or optionally as self-extracting ZIP archives, for recipients whose mail doesn't block EXE files), and as a bonus, it indexes the



PocketKnife makes all the features of Outlook accessible from the system tray.

filenames and senders of all your Outlook attachments. The process is entirely transparent and doesn't need any configuration, though you can customize its settings. (Micro Eye Inc., www.microeye.com. ●●●●●)

Even in its sleek Office 2003 incarnation, you may not want Outlook open all the time. **PocketKnife** (\$30) runs as an icon in the system tray and lets you send e-mails, letters, and faxes to Outlook contacts without opening Outlook. You enter part of a contact name in a pop-up window; PocketKnife finds the name in one or more Outlook contact folders and displays the corresponding address, phone number, and e-mail address under a row



Attachment Forget-Me-Not is a gratifyingly simple and indispensable tool.

of buttons that either launch an e-mail message or launch Word to create a letter, envelope, or fax cover sheet with the recipient's data already included. Extensive hotkey support makes these functions available from inside any application. (Xintercept, www.xintercept.com. ●●●●●)

When your e-mail client isn't running, a compact e-mail notifier can alert you to incoming messages and give you the chance to preview or delete each one. Among dozens of available mail notifiers, **PopTray 3.0** (free) stands out as the most compact, customizable, and flexible, with built-in support for standard POP3 mailboxes and optional plug-in support for IMAP4 servers and for Hotmail. PopTray can flag or delete spam using user-specified rules or work transparently with antispy software like SpamPal (www.spampal.org), which flags messages for automatic or manual deletion by PopTray. (Renier Crause, www.poptray.org. ●●●●●)—Edward Mendelson ☰

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SPAM BLOCKERS

Yes, many of the leading e-mail clients and services, including Yahoo! Mail, Hotmail, and Microsoft Outlook 2003, offer built-in antispam tools. And yes, some (notably Hotmail and Oddpost) have native abilities as good as if not better than some add-on applications. But what if you're using a client that lacks effective antispam filters? With spam likely to make up more than 70 percent of e-mail traffic next year, you'll need a tool dedicated to solving this problem.

We review 11 antispam utilities in this roundup. Eight of them rely heavily on complex techniques to separate spam from legitimate mail. Typically, unsolicited bulk e-mail looks very different than everyday correspondence, and such tools seek to exploit those differences. We tested these applications using a *PC Magazine* e-mail account that receives regular correspondence from our readers—along with plenty of spam. By redistributing the account's mail into eight identical user accounts, we were able to test each app with exactly the same messages.

Some of the apps let you train their filters. We spent a few days on such training, identifying what was and what wasn't spam as several hundred messages streamed in. This done, we waited until nearly 500 new messages had arrived. Each pro-

gram had a crack at the same messages, which let us test how well they distinguished between valid mail and what we consider spam. Note however, that we tested their ability to identify spam without the aid of whitelists, blacklists, or challenge/response techniques. (For more on our testing techniques, go to www.pcmag.com/spam.)

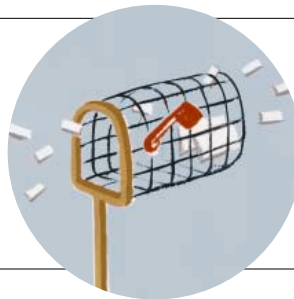
The test results are shown in the table on page 81. *Spam allowed* indicates the percentage of junk mail that slipped by a program's filters to land in our in-box. *Legitimate mail blocked* indicates the percentage of *false positives*—real mail mistakenly treated as spam—an even worse problem than spam in the in-box.

The three other tools we review use *whitelist* schemes. These tools compile lists of people you want mail from, and this list is the primary means of filtering your incoming mail. If someone on your list sends you a message, it goes into your in-box. If a sender isn't on the list, the message is challenged or blocked.

Whitelist products don't need the sort of filter testing described above. You already know what they will and won't block. The differences lie in how skillfully an app builds its list of approved senders and how easily you can check for important mail arriving from unexpected sources.

>filtering

Filtering applications keep spam out of your in-box by examining e-mail headers and message contents.



MailFrontier Matador

\$29.95 direct. MailFrontier Inc.,
www.mailfrontier.com. ●●●●●

If you follow the war on spam, chances are you've heard about MailFrontier Matador and its challenge messages. You can configure the app to send mail automatically to unknown senders, asking them to identify the number of kittens in a digital photograph. If they reply correctly—automated mailing programs theoretically can't—they're whitelisted.

Challenge messages are only a small part of Matador, however, and if you're worried about annoying friends or colleagues—or losing legitimate business mail you've opted to receive—you can turn them off. Matador blocks spam via message analysis as well.

Much like Cloudmark's SpamNet, Matador adjusts its filters using data collected from its user community. The app adds two buttons to each user's e-mail client, so they can identify what they consider spam. But if you'd rather not depend too heavily on the opinions of others, you don't have to: You can scale back the collaborative filter and carefully customize your own set of message filters. Six con-

iHateSpam

\$19.95 direct. Sunbelt Software USA,
www.sunbelt-software.com. ●●●●●

Sunbelt Software, maker of iHateSpam, still hasn't solved the app's false-positive problem. When we reviewed iHateSpam last spring ("More Ways to Slam the Spam," May 27, page 32), it had one of the worst false-positive rates. This time the program didn't fare any better: Nearly 20 percent of our legitimate mail was classified as spam.

To be fair, the app also blocked an impressive amount of spam. Of the more than 400 spam messages we fed it, 91 percent were correctly identified. You can easily set up traditional whitelists and blacklists, customize filters to block messages containing certain words or phrases, and even make filters to *allow* messages

containing certain words or phrases.

Sunbelt offers two separate versions of the app: one for Outlook Express, and one for Outlook, which can handle IMAP and Exchange accounts. Each version is fairly easy to use. Another notable feature is iHateSpam's Hotmail integration, which is among the best we've seen in that you can use the program from within Hotmail's Web interface. All of the other products in this roundup except Spam-Killer only do this in Outlook or Outlook Express. We particularly like that, upon installation, a wizard lets you preset the aggressiveness of the filters. Five different settings are available; we tested using the default middle setting. Judging from the app's high false-positive rate, you'll probably want to start at one of the two lower settings.



Matador's challenge system separates the humans from the automated spam bots.

trols help you govern what gets through.

In the past, when we've tested Matador's message-filtering abilities at PC Magazine Labs, it has always had a slight problem with false positives. This time out, the problem worsened. It mistakenly blocked 14 percent of legitimate messages. Moreover, the program didn't catch as much spam as it should have. Twenty percent of junk mail messages slipped through its filter. But that doesn't mean Matador isn't worthy of consideration. We like its powerful, easy-to-use interface. With more training, Matador's performance is likely to improve.

MailWasher Pro

\$29.95 direct. Firetrust Ltd.,
www.firetrust.com. ●●●●●

Firetrust's MailWasher Pro suffers from the same problem as ChoiceMail, Digi-Portal's popular whitelisting product: It doesn't integrate with your mail client. Instead, it resides in a completely separate window that is, in effect, a second inbox. More important, the product performed poorly on our tests: It caught less spam than any other utility in our review, and its false-positive rate was a regrettable 16 percent.

With apps like Norton AntiSpam and Qurb, which so tightly integrate with Outlook, your quarantined mail is sitting right there in your e-mail client. Taking a peek is easy. With MailWasher, you can't check your quarantined messages—or deal with them—without toggling to another window. The app's lone advantage is that it works with almost any POP3, IMAP, AOL, or Hotmail account. It does not, however, handle Exchange accounts.

We also wish that the software was a bit easier to install; you must manually input your e-mail server and user name during setup. That said, MailWasher does have strengths: You can create your own message filters. You can blacklist and whitelist entire domains. And if you feel like blowing off a little steam (though it won't actually help), you can bounce messages back to whence they came.

McAfee SpamKiller

\$34.95 a year, direct. McAfee Security,
www.mcafee.com. ●●●●●

If you're already a McAfee customer, using such apps as McAfee VirusScan or Personal Firewall+, McAfee SpamKiller is worth looking into. Like other McAfee apps, it fits neatly into SecurityCenter, the company's unified user interface. But in the end, we can't recommend using it. To begin with, SpamKiller does not integrate with your e-mail client as tightly as it should: You have to open a separate window to check your quarantine folder. It's also painfully slow. Once you get to the quarantine folder, the program takes another few seconds to open a message. Third and most important, SpamKiller was one of the poorest performers during testing at PC Magazine Labs. It blocked only 64 percent of spam, and it quarantined half of our legitimate messages. The app is sure to improve with customization, but a 50 percent false-positive rate—even on a first run—is unacceptable.

On the upside, SpamKiller supports Hotmail and Exchange accounts, not just POP3. And it offers an unusually wide range of tools for customizing its anti-spam engine. You can easily add addresses to your whitelists and blacklists, view and edit individual filters, and even use different settings with different e-mail addresses on the same machine.

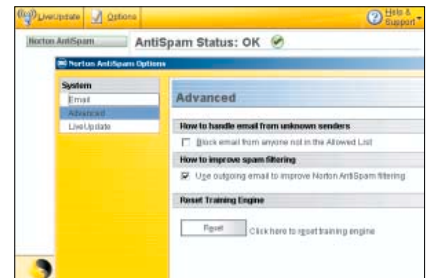
Norton AntiSpam 2004

\$39.95 direct. Symantec Corp.,
www.symantec.com/antispam. ●●●●●

Three cheers for the new kid on the block, Symantec's Norton AntiSpam 2004, which is also available as part of Norton Internet Security 2004. Symantec's first standalone venture into the anti-spam market caught a greater percentage of junk mail than

any other standalone utility we tested. It gives you a fair number of tools for customizing its filters, and much like the other Norton security products, it's wonderfully easy to set up and use. The worst you can say about this product is that it works only with POP3 clients; IMAP, Exchange, and Hotmail users are out of luck.

You can easily build whitelists and blacklists. You can create your own filters, telling the app to block messages containing certain words or phrases. And, using a pair of buttons added to your e-mail client, you can train its Bayesian engine to recognize what you consider spam. Once up and running at PC Magazine Labs, Norton AntiSpam 2004 blocked 93 percent of the spam streaming into our in-box, and it incorrectly identified only 3 percent of the legitimate mail we received.



Norton AntiSpam can fine-tune its filter settings by analyzing your outgoing mail.

You can adjust the overall aggressiveness of the app's engine, but you have only three levels to choose from: low, medium, and high. During testing, we used the default medium level. As a bonus, Symantec includes a tool for blocking Web pop-ups.

SAproxy Pro

\$29.95 direct. Stata Labs Inc.,
www.statalabs.com. ●●●●●

Based on the open-source mail filter app SpamAssassin, Stata Labs' SAproxy Pro ranks with the market's most effective antispam utilities. During testing at PC Magazine Labs, without any customization, it blocked 89 percent of our spam, with a false-positive rate of under 2 percent. The trouble is, although SAproxy works with any POP3 mail client, it reaches its full potential only when used with Stata Labs' own client, Bloomba (reviewed on page 68).

If you're a Bloomba user, SAproxy installs quickly and easily. It automatically



shuttles suspected spam to Bloomba's existing quarantine folder, and it activates a button on the Bloomba toolbar that lets you easily train its Bayesian filter. If you use Outlook, Outlook Express, or some other client, installation is more difficult. And if you don't use Bloomba, you can't train SAproxy's Bayesian filter. You must manually update your client settings to route mail through SAproxy, and unless you create a new rule with your client, suspected spam will only be tagged as such, not filtered into its own folder. (Stata Labs provides video tutorials for this and other topics on its Web site.)

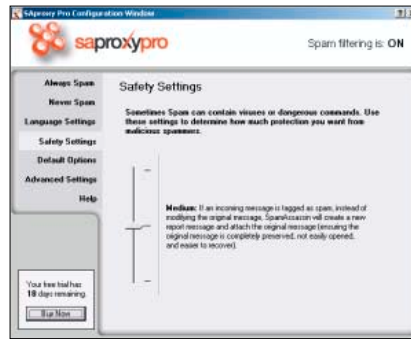
Otherwise, SAproxy works just as well with third-party clients. You can create whitelists and blacklists, filter based on specific words or phrases, or even instruct the app to remove potentially dangerous content, such as attachments, from suspected spam automatically.

SpamCatcher

\$29.99 direct. Mailshell Inc., www.mailshell.com. ●●●●●

The last time we reviewed Mailshell's SpamCatcher ("More Ways to Slam the Spam," May 27, page 32), we praised its ability to avoid false positives but criticized its spam-catching abilities. Since then SpamCatcher has achieved a much more appropriate balance. It caught 91 percent of our spam, and its false-positive rate rose no higher than 3.2 percent.

SpamCatcher comes in two flavors: one for use with Outlook, and one universal version for use with other POP3 clients.



SAproxy's safety settings let you decide how aggressively to go after spam.

The Outlook version is the more impressive of the two. It integrates tightly with the client, with buttons for quickly adding senders to whitelists or blacklists and a long pull-down menu for quick access to other tools. One complaint: The app can significantly impair Outlook's speed. Using the program with a mailbox filled with thousands of messages, we had difficulty just scrolling through our folders, even when the program wasn't analyzing incoming messages.

SpamCatcher's antispam engine operates much like that of MailFrontier Matador. Its filters rely partly on the opinions of its users. You can contribute to the community consensus via commands accessible from the software's pull-down menu. Unlike many products, SpamCatcher also lets you easily whitelist or blacklist entire domains, and it conveniently lets you choose which Outlook folder you wish to use for quarantined mail.

SpamNet

\$3.99 a month or \$39.95 a year direct. Cloudmark, www.cloudmark.com. ●●●●●

Cloudmark's SpamNet is famous for blocking spam using the opinions of its user community. As SpamNet filters mail, users identify mistakes, pointing out spam that was allowed through or blocked legitimate mail, and the filters are updated accordingly. But you needn't defer to your peers entirely. You can also set up your own whitelist.

Cloudmark offers two versions of SpamNet: one for Outlook and one for Outlook Express. The OE version is still in beta, and when it's finished, the two versions will be rolled out together. Unfortunately, SpamNet doesn't support other clients, but it does handle Exchange as well as POP3 connections. Both versions are exceedingly simple. Each adds no more than three new buttons and a quarantine folder to your mail client. Block and Unblock buttons let you contribute to the community consensus, while a third button opens a short list of tools, letting you configure a whitelist, check your spam statistics, and more. But you can't automatically import your address book into your whitelist.

In our testing, SpamNet correctly blocked 91 percent of incoming spam, and it mistakenly filtered only one legitimate message. And once your whitelist is in place, performance may improve.

PERSONAL ANTISPAM TOOLS

	CLIENTS SUPPORTED			PROTOCOLS SUPPORTED				FEATURES				RATINGS AND SCORES					OVERALL		
	Outlook	Outlook Express	Any POP client	POP	IMAP	Exchange	Hotmail	Analyzes messages	Whitelist	Blacklist	Challenge/response	Collaborative filtering	Setup	Ease of use	Customization	Accuracy		Legitimate mail blocked ▼	Spam allowed ▼
FILTERING																			
iHateSpam	✓	✓*		✓	✓	✓	✓	✓	✓	✓			●●	●●	●●●	●	19.0%	9.1%	●●
MailFrontier Matador	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓		●●	●●●	●●	●	14.3%	19.9%	●●
MailWasher Pro	✓		✓	✓	✓			✓	✓	✓	✓		●●	●	●●●●	●	15.9%	54.1%	●●
McAfee SpamKiller	✓	✓	✓	✓		✓	✓	✓	✓	✓			●●●	●●	●●●●	●	50.8%	35.8%	●
Norton AntiSpam 2004	✓	✓	✓	✓		✓	✓	✓	✓	✓			●●	●●●●●	●●●●	●●●●	3.2%	7.1%	●●●●
SAproxy Pro	✓	✓		✓		✓	✓	✓	✓	✓			●●	●●	●●●●	●●●●	1.6%	11.0%	●●●
SpamCatcher	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓		●●	●●●●	●●●●	●●●●	3.2%	9.5%	●●●●
SpamNet	✓			✓	✓	✓	✓	✓	✓		✓		●●●	●●●●	●●	●●●●●	1.6%	9.3%	●●●●
WHITELIST																			
ChoiceMail 2.0	✓	✓	✓	✓			✓	✓	✓	✓	✓		●●	●●	●●●●	N/A	N/A	N/A	●●
Qurb 2.0	✓	✓		✓		✓		✓	✓	✓	✓		●●●●	●●●●	●●●	N/A	N/A	N/A	●●●●
Vanquish Pro 1.135	✓	✓	✓	✓				✓	✓	✓	✓		●●●	●●●	●●●	N/A	N/A	N/A	●●

RED denotes Editors' Choice. * Separate version, not tested. N/A—Not applicable: This technique does not result in false positives or false negatives.

whitelist

Whitelisting applications stop spam from reaching your in-box by allowing e-mail from only those senders you specify.

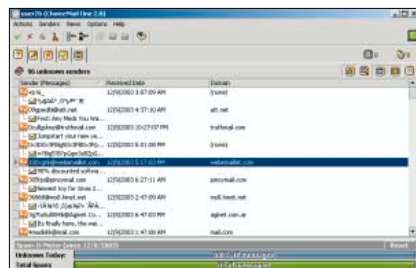


ChoiceMail 2.0

\$39.95 direct. DigiPortal Software Inc., www.digiportal.com. ●●●●●

DigiPortal's ChoiceMail was the first app to filter spam solely through whitelisting, and pundits hailed it as the ultimate anti-spam tool. ChoiceMail 2.0 can be effective, but it relies too heavily on challenge messages, which may annoy friends and colleagues and can be ineffective for dealing with legitimate commercial e-mail. In fact, DigiPortal is beginning to add filters to block spam via message analysis.

On installation, the app builds a whitelist of approved senders from your address book. You can then edit the list or create a blacklist. Messages from approved senders automatically go to your in-box; blacklisted senders' mail



ChoiceMail is a standalone app that quarantines mail from unknown senders.

goes into ChoiceMail's trash folder. Mail from unknown senders is quarantined and the senders get challenge messages.

Unfortunately, ChoiceMail doesn't integrate with your e-mail client. This means that checking your quarantine folder requires toggling between two windows. In addition, ChoiceMail's initial whitelist isn't as comprehensive as Qurb's, which can draw addresses from any message you've sent or saved.

On the positive side, DigiPortal now offers a separate, downloadable tool that attempts to mimic the way Qurb builds its initial whitelist. And unlike Qurb, which only works with Outlook and Out-

look Express, ChoiceMail works with any POP3 e-mail client as well as several Web-based services.

ChoiceMail also has a new Permission Management subsystem that lets you block messages with certain characteristics. Predefined filters are available for download, and you can create your own.

Qurb 2.0

\$29.95 direct. Qurb Inc., www.qurb.com. ●●●●●



Don't think a whitelist product can crack your spam problem? A few minutes with Qurb 2.0 will put your doubts to rest. Qurb uses nothing but a whitelist to filter incoming messages, but it sidesteps the inconvenience typically associated with whitelisting. It's so adept at building the list that few legitimate messages wind up in quarantine, and unlike ChoiceMail, it integrates with your Outlook or Outlook Express client, so checking your quarantine folder isn't a hassle. The only drawback: It doesn't work with other mail clients.

On installation, Qurb adds three buttons and a quarantine folder to your client. Then it builds a whitelist from Outlook's contact database and calendar, as well as from any messages you've sent, received, opened, or saved. Even if you rarely update your contacts, this list is remarkably accurate.

Of course, you have to check your quarantine folder regularly, but Qurb makes it easy. Simply move to the folder with one click and move back to your in-box with another. If any important mail is quarantined—or if any spam winds up in your in-box—you can instantly edit your whitelist using Qurb's Approve and Block buttons on the mail client's toolbar. You can also instruct the software to send challenge messages, asking it to add respondents to your whitelist automatically, but this feature is turned off by default.

Vanquish Pro 1.135

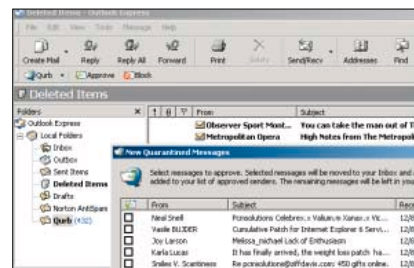
\$24.95 direct. Vanquish, www.vanquish.com. ●●●●●

Vanquish Pro 1.135 adds a new twist to the whitelisting paradigm. While it offers reasonable whitelisting capabilities (though not as good as Qurb's), it doesn't require senders to be on your list to mail you, nor do they have to answer challenges. Instead, they can reach you by putting up a bond with Vanquish's developers, a small guarantee that they won't spam you.

If bonded senders spam you, you can penalize them by deducting money from their bonds. Only five cents is deducted per message (which goes not to you but to your ISP, providing insurance against reporting legitimate mail as spam to collect the bond), but for high-volume spammers this could add up quickly. Vanquish is so new, however, that only a handful of users are bonded (Vanquish puts up a bond for all new users), and it's unknown whether nonusers will freely post their own bonds.

Most whitelists can accidentally block responses when, for example, a message sent to a help desk gets a response from an individual who isn't on the sender's whitelist. Vanquish's SmartSubject can watch for mail with subjects matching recently sent items and let them through. Whitelists also tend to block confirmation e-mails from shopping sites. Vanquish's SurfWatch logs visits to such sites and temporarily allows their e-mails through.

On the other hand, the app doesn't have a true quarantine folder: You can view a list of messages from unknown senders who have yet to respond to challenges, but you can't open the messages on the list. You can see only sender addresses and subject lines. And the list is inconveniently located. But Vanquish is easy to set up and reasonably adept at building accurate whitelists. Ultimately, Vanquish's usefulness depends on broad adoption. ☰



You can't read quarantined e-mail in Vanquish; decisions must be based on the header alone.

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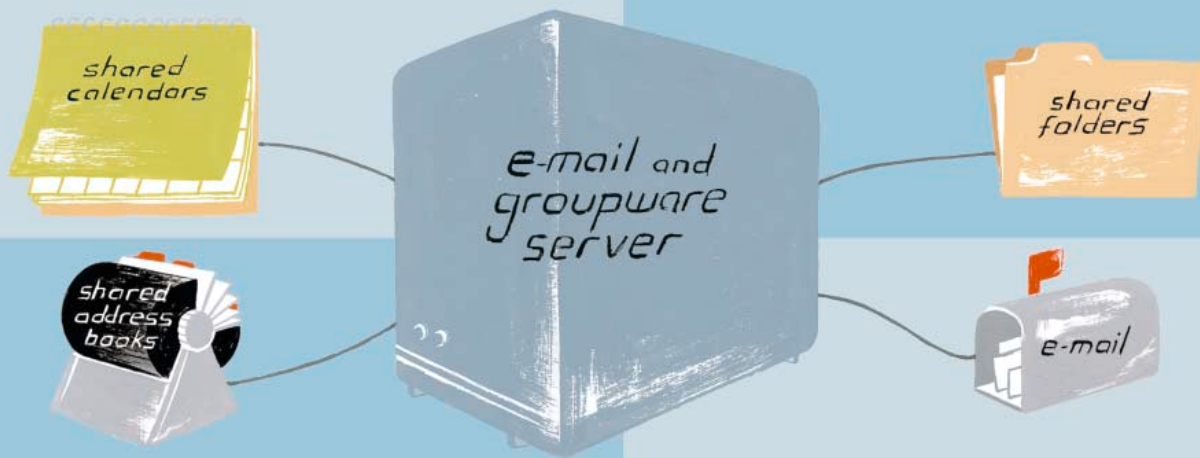
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E-Mail Servers

Corporate e-mail systems are a mixed blessing: They can try the patience of even the most laid-back IT manager, yet they remain the lifeblood of business communications. No longer just about sending and receiving messages, e-mail systems now let you schedule group meetings, delegate tasks, and share documents—all parts of the constellation of activities that *groupware* addresses.

Microsoft's Exchange and Outlook combo has become the dominant player in the groupware game, but IT managers are facing the choice of whether to upgrade from the popular Microsoft Exchange Server 5.5—not a trivial undertaking—or to look elsewhere. We consider your options and help you make the right decision.

Luckily, tools for managing mail continue to improve, and that's a good thing in the face of increased complexity. "Messaging systems are getting too complicated for some businesses to handle," says Marcel Nienhuis, senior analyst at the Radicati Group, a research firm. "In some cases, there are just too many issues to think about—spam, viruses, legal compliance, storage."

The e-mail servers we evaluate in this story not only help control the nuisances but also offer new tools, such as secure Web or mobile-device access, to enable groups of employees to share knowledge more effectively.

To test the latest generation of software, we deployed six groupware servers at PC Magazine Labs. We examined them from the perspective of a small- to mid-size business. Our hypothetical company was large enough to have one or two people dedicated to IT projects but not so large that performance or high-end considerations like clustering were critical.

Smaller companies with little or no IT support may prefer to rely on POP-based (or preferably IMAP-based) e-mail accounts from a Web-hosting provider on an outsourced mail-hosting service (see the sidebar "Servers or Service?") or on an integrated small-business server. (For more information, see our feature on small-business operating systems "Taking Care of Small Business," February 3.)

The mail servers we selected support groupware capabilities at a minimum, allowing users to share contact lists, folders, and calendars. Our requirements excluded some long-established single-purpose e-mail solutions such as Ipswitch's IMail Server and Sun Java System Messaging Server, as well as some newer prod-

BY JOHN CLYMAN

Exchange is the leader in groupware servers, but is it the best? We compare it with five contenders that let you collaborate using more than just e-mail.

REVIEWED IN THIS STORY

- 86 CommuniGate Pro 4.1.7 ●●●●●
- 87 IBM Lotus Domino 6.5 ●●●●●
- 88 MailSite SE 6.0.6 ●●●●●
- 89 Microsoft Exchange Server 2003 ●●●●●
- 91 Novell GroupWise 6.5 ●●●●●
- 94 SUSE Linux Openexchange Server 4.1 ●●●●●
- 87 Editors' Choice
- 88 Servers or Service?
- 89 Scorecard
- 90 Mail Server Lockdown
- 91 Before You Upgrade: Five Things to Consider
- 92 Summary of Features
- 93 Interview: In the Mail Server Trenches

Our contributors: **John Clyman** is a contributing editor of *PC Magazine*. **Matthew D. Sarrel** is a PC Magazine Labs technical director. **Cade Metz** is senior writer. Associate editor **Michael W. Muchmore** and PC Magazine Labs project leader **Sahil Gambhir** were in charge of this story.

ucts such as Gordano Messaging Suite and Kerio MailServer. Gordano and Kerio are working on versions that will supply groupware features over the next few months. Also, we did not test Oracle Collaboration Suite Release 2, which competes with Exchange and Domino but targets large organizations and has greater infrastructure and IT staff requirements.

TWO APPROACHES

The systems we tested fall into two groups. The first type is the end-to-end groupware system, such as Exchange (with its Outlook client), Domino with Notes, and Novell GroupWise. Such systems let you use third-party mail clients, but doing so eliminates many benefits of the platforms. In practical terms, you're buying into a complete client-server mail system.

The second group is typified by CommuniGate Pro, MailSite, and SUSE Openexchange. These offer a mail and groupware server but no dedicated client. Instead, each includes a client-side plug-in that lets you use Outlook for groupware functions.

All of the servers we tested support Web clients to varying degrees. SUSE Openexchange's Web client, for example, is an ideal way to access a server and use its groupware functions. The Domino Web Access client and the Microsoft Outlook client both provide rich experiences that closely parallel what you get with native clients. On the other hand, MailSite SE's Web interface has none of the groupware features of its TeamSite plug-in for Outlook.

Although the companies that take the plug-in route may pitch their servers as easier-to-administer alternatives to Exchange, you should keep in mind two things: To use them with Outlook, you'll still need a license for Outlook from Microsoft. Second, and more significant, you'll have to deploy and configure the plug-in on each client system—a tedious task that results in a big time-sink when multiplied across dozens of desktops.

The products from Microsoft and Novell (and to a lesser extent IBM Lotus) come with a caveat of their own: They depend on a corporate directory—Active Directory in the case of Microsoft and the LDAP-compliant eDirectory in the case of Novell. Although the advantages of unified corporate directory structure are clear (especially for larger organizations), administra-

tive overhead is involved in setting up and maintaining one. This fact no doubt accounts for the reluctance of many Exchange 5.5 customers to upgrade to Exchange 2000, where deploying Active Directory was mandatory for the first time.

The full-blown groupware products offer a clear advantage if you want to go beyond shared folders and calendaring and implement workflows, knowledge management, custom applications, or integrate with portal and instant-messaging systems. Lotus includes these in the Domino server, whereas Microsoft makes them available via separate offerings.

ASSESSING THE COSTS

Pricing for mail servers can be complicated, based not just on the number of users, but also on which features you use. Often there's a price distinction between using just e-mail (inexpensive) and employing the groupware features (ranging from \$50 to \$100 per seat). We asked vendors to quote us pricing for three tiers: 50, 250, and 1,250 users (including server and client licenses with groupware capability). Some servers come with antivirus and antispam solutions built in, and others carry additional costs for these features.

Still, the price of the client and server licenses may make up only a small portion of the total costs. You've got server hardware and OS licenses to consider. Then there's the initial labor involved with setting up and configuring your server, deploying and configuring the clients, and migrating existing user profiles and data stores. Add to that ongoing costs such as managing security (think *patches*), backing up, performing routine administration, training, and support.

E-mail security isn't something you can take for granted, so as part of our evaluation, we examined features for controlling spam and viruses and guarding against unwanted SMTP relaying, address harvesting, and other attacks. Mail servers should also give you secure access to users in a variety of environments. (For tips on mail server security, see the sidebar "Mail Server Lockdown," page 90).

We found each of the products we tested to be highly capable. They differ in implementation and vary in feature sets, but your choice will partly depend on existing systems at your company and the skills of your IT staff. The variety of options means you're sure to find a good fit.

CommuniGate Pro 4.1.7

\$499 for 50 users and 5 listservs; groupware starts at an additional \$1,199 for 25 users. Stalker Software Inc., www.stalker.com. OVERALL RATING: ●●●●●

Stalker's CommuniGate Pro has a lot going for it: easy installation, straightforward basic configuration, extensive multiplatform support, and plenty of scalability. But its Web-based interface—in both its administrative and Web mail incarnations—is notably antiquated. And, as with the products from Rockliffe

and SUSE, setting up the plug-in that enables features like group scheduling from Microsoft Outlook requires several steps. Although Stalker originally aimed CommuniGate Pro at ultra-high-volume environments such as large ISPs and telecommunications carriers, the latest version also targets midsize to large enterprises. Given its high-end origins, we were pleasantly surprised by CommuniGate Pro's simple installation: You just unzip the files, run a setup pro-

gram, and press a single button.

Adding users and performing routine configuration tasks is a matter of filling out Web forms. The administrative interface seems to hark back to the mid-1990s—functional but decidedly Spartan—and we found some settings pages cluttered with distracting arcana that most administrators can safely ignore. CommuniGate Pro also lets you script administrative tasks via a command line interface.

Using the server's POP and IMAP capabilities from clients presented no difficulties, but configuring CommuniGate Pro's groupware features required a bit more effort. First, we had to install a client connector and establish a new type of connection to the server. Then, to enable group scheduling, we needed to install Microsoft's Web Publishing Wizard and change configuration settings in Outlook. While this isn't onerous, it requires touching every client in your organization.

CommuniGate Pro offers Web-based access to e-mail, but the supplied interface is very basic and not forgiving of novice users. Several skins should be available from Stalker to improve its appearance by the time you read this. Its Web-based calendaring is so primitive that we can't imagine using it in a production environment.

On the security front, CommuniGate Pro offers a variety of options, such as using public blacklists or blocking by domain name, banning messages based on header or body content, and requiring SMTP authentication or read-then-send authentication. We were heartened to see that, by default, SMTP relaying is allowed only from addresses on the local network. Stalker offers third-party, server-side antivirus and antispyware plug-ins as extra-cost options.

For large deployments, CommuniGate Pro includes dynamic clustering and SNMP monitoring. The server also has integrated directory services that can be exposed via an LDAP module, or it can use third-party LDAP servers if your organization already has them. Stalker currently provides tools for migrating e-mail from existing server installations.

If your company primarily needs an inexpensive, easy-to-deploy, or especially

IBM Lotus Domino 6.5



Yes, most businesses are moving towards Outlook and Exchange. But while this gives you a slick interface, you'll miss out on some very useful groupware features in Domino and Notes, like the ability to create databases and discussion groups. In addition to Lotus's unmatched collection of collaboration features and customizability, setting up our test installation of Domino was a far less headache-inducing prospect than setting up Exchange. Add to this a superior security record and strategy, and Domino is the clear winner of our Editors' Choice.

Still, we're so impressed with the client interface you get from Microsoft—especially with the enhancements in the 2003 version—that we deem Exchange worthy of honorable mention. Though its groupware options are limited compared with those included in Domino and its setup is more involved, it certainly beats Lotus for client usability.

On a final note, we were unexpectedly delighted by SUSE Openexchange's breadth of collaboration tools—e-mail, IM, shared calendars, shared documents, discussion groups, and project management—as well as its unimposing setup process.

scalable solution for basic e-mail, CommuniGate Pro is a strong choice. If Web-based mail access and groupware are crucial to your business, then Microsoft Exchange or Lotus Notes—or the less imposing SUSE Openexchange—will serve your needs better.

IBM Lotus Domino 6.5

\$119 per user; server, \$2,964; Notes client, \$93.75 each; Domino Web Access client, \$31.50 each; Outlook connector license, \$31.50; basic Web client, \$25 each. IBM Corp., www.lotus.com. ●●●●●

With roots going back to the 1970s, Lotus's Domino server and Notes client have long been synonymous with the term *groupware*, and today Domino remains the preeminent groupware server.

For small and midsize companies looking both for basic e-mail and for group calendaring, the choice comes down to Domino or Exchange. In Domino's favor: better multiplatform support, easier

setup, and more features (such as instant messaging) included in the base product. Notes also offers unmatched customizability, with a programming language and interface design

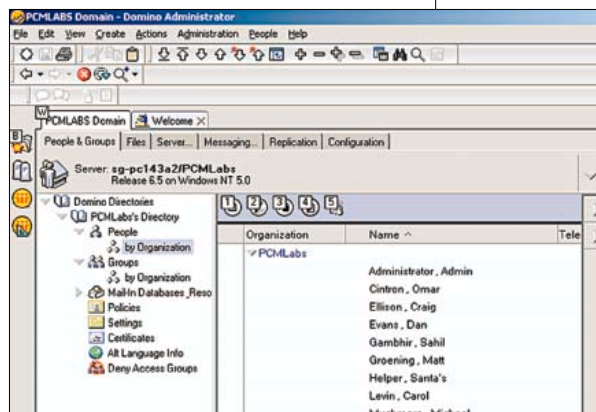
You can control and configure the Lotus Domino server through an administrative version of the Notes client.

tool that lets you build collaborative tools, workflows, and databases tailored exactly to your company's needs. The downside: A less-familiar client interface. Despite this one drawback, Domino gets our Editors' Choice as the best overall groupware server.

For existing Domino installations, the 6.5 upgrade is relatively minor, with improved clustering, server-side mail rules, and improvements in rescheduling for recurring meetings. Domino 6.0 and 6.5 servers can coexist, or you can perform an in-place upgrade. For Exchange shops, IBM Lotus bundles migration tools that recreate your entire Exchange and Outlook data sets in Domino and Notes.

Our Domino installation proceeded surprisingly smoothly in contrast with Exchange or GroupWise, the products it competes with most directly. That's partly because Domino doesn't require a separate, long-winded directory server installation. Domino's native directory is not LDAP-based, but IBM Lotus does offer synchronization tools to let external applications access the Domino directory.

IT staff accustomed to other mail systems may take time to learn the interface (a version of the Notes client), its terminology, and requirements such as ID files. These are mandatory token files that users combine with passwords to confirm their identity. To combat spam, Domino supports RBLs and server-side rules, and many third-party vendors offer



more sophisticated filtering.

Lotus offers a choice of clients. You can use Domino as a standard POP-and-IMAP, mail-only server, though this robs you of its unique advantages. You can also access some groupware capabilities via an Outlook plug-in the way you do with CommuniGate. But it makes the most sense to use the full-fledged Notes client, or at least the Domino Web Access client—a close replica of the native client that uses dynamic HTML for a responsive interface. Domino can automatically push out new versions of Notes.

Notes' interface has improved markedly over the years, but it will still seem quirky to first-time users, particularly those accustomed to Microsoft Office applications. But common tasks like composing e-mail and requesting meetings are straightforward, and Notes mail has some nice touches, like letting you embed forms, outlines, and instant-messaging contacts directly into messages.

We also liked Notes' QuickRule, which lets you use an e-mail as a template for a mail-filtering rule—an easy way for individual users to deflect spam. If you want to build workflows, custom databases, or even entire groupware applications, you can use Domino Designer, an application development environment integrated with Notes. Developers can also use LotusScript, a BASIC-like, object-oriented programming language, or JavaScript, Java, JSP, or C/C++ through APIs.

Domino and Notes pricing can get extremely complicated. One option for businesses with up to 1,000 users is an all-

you-can-eat price of \$119 per client, with no per-server charges. Prices quoted are for competitive upgrades; prices for companies without existing e-mail systems will average about 25 percent higher.

If your company wants the most exten-

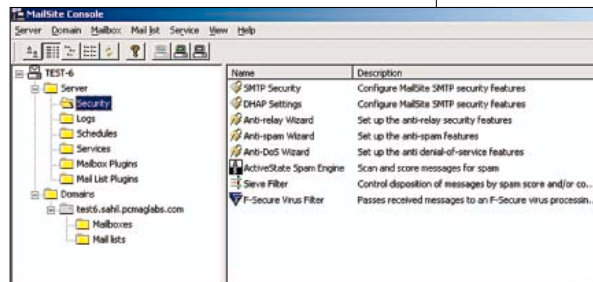
use, and reasonably priced e-mail platform—and we particularly liked some of its security features—the foray into groupware needs more work before it's a compelling alternative to Exchange.

Like Stalker and SUSE, Rockliffe implements groupware via a plug-in for Microsoft Outlook, so deploying it means updating all the client machines in your organization. And the plug-in configuration is tricky: It requires a large number of individual steps, some of which are confusingly documented.

MailSite's Web interface, known as MailSite Express, isn't a real al-

ternative. It doesn't support the groupware functions, although it does allow individuals to manage personal calendars, tasks, and notes. The Express client had a relatively spare feature set even for mail management. It omits things like follow-up flags and replied-to-message indicators, which might have made it a viable option.

On the server side, we found a lot to like. Initial installation was extremely simple and straightforward, with none of the configuration hassles of Microsoft Exchange or Novell GroupWise. The server runs only on Windows; administrators manage users and server settings through a console reminiscent of the Microsoft Management Console, with a tree view in the left pane and settings in the right.



MailSite SE's administrative console, which resembles an MMC plug-in, clearly exposes server configuration options, although we found that some settings were hidden in unexpected places.

groupware features available, or if it needs multiplatform support, Lotus Domino 6.5 and Notes 6.5 make for a highly compelling choice.

MailSite SE 6.0.6

\$595 for 50 mailboxes and unlimited listservs; groupware capabilities, \$30 per user. Rockliffe Inc., www.rockliffe.com. ●●●●●

Rockliffe's MailSite is best known for its hassle-free e-mail administration, which we've rated highly in the past. More recently, the company has extended its reach into groupware with the MailSite Team plug-in for Microsoft Outlook, which we tested in its beta version shortly before it shipped. While we still think MailSite itself makes for a solid, easy-to-

servers or service?

SHOULD YOU OUTSOURCE OR KEEP IT IN-HOUSE?

Many smaller companies will want to steer clear of the hassles of setting up and maintaining their own e-mail servers on their own server machines. In fact, aside from small, tech-savvy companies, the vast majority of small companies rely on an outsourced e-mail service from an ISP or a specialized mail host. Market research firm IDC projects that by 2005,

some 50 percent of business e-mail accounts will be hosted by service providers. The reason is simple: Hosting lets someone else worry about spam, viruses, legal compliance, storage, and security patches while you focus on your company's business.

With the release of Exchange 2003, the software is far more suitable to hosting. This release presents major

upgrading difficulties for companies hosting their own mail servers. Service providers give such companies a way to upgrade without the pain. An extensive list of Exchange hosts appears at www.crowcanyon.com/ExchangeASP.htm.

We recently spoke with Marcel Nienhuis, senior analyst at research firm Radicati Group, to determine the issues companies should consider

before they decide whether to outsource e-mail.

REASONS TO HOST YOUR OWN E-MAIL

- ▶ You have more than 200 users and a complex privilege heirarchy.
- ▶ Your company has its own IT department and data center.
- ▶ Your company deals with sensitive communications.
- ▶ You want to integrate your e-mail server with other enterprise software such as CRM or ERP systems.

SCORECARD



For the **setup** rating, we consider the level of expertise and the existing infrastructure required to handle OS setup, migration and upgrade tools, and any remote-office or client setup required. For **management**, we evaluate the management console interface and the ease of handling group and individual privilege features, backup and restore, policy-based management, SNMP support, and diag-

nostic and monitoring tools. The **Web client** category includes spell-checkers, follow-up flags, client interface, and the ease of working with e-mail and groupware. We define **groupware** in terms of shared features such as calendars and scheduling, folders, documents, and address books. Knowledge management functions are a plus here. **Scalability** is boosted by integration with directory servers, published APIs, delegated administration, and cluster support.

	Setup	Management	Web client	Groupware	Scalability	OVERALL
●●●●-EXCELLENT						
●●●-VERY GOOD						
●●-GOOD						
●-FAIR						
○-POOR						
CommuniGate Pro 4.1.7	●●●	●●●●	●●	●●	●●●	●●●
IBM Lotus Domino 6.5	●●●●	●●●●	●●●●	●●●●	●●●●	●●●●
MailSite SE 6.0.6	●●●	●●●●	●	●	●●●	●●●
Microsoft Exchange Server 2003	●●●	●●●	●●●●	●●●●	●●●●	●●●●
Novell GroupWise 6.5	●●●	●●●●	●●●●	●●●●	●●●●	●●●●
SUSE Linux Openexchange Server 4.1	●●●●●	●●●●	●●●●	●●●●	●●	●●●●

RED denotes Editors' Choice.

The management tool is a native application but is also accessible via a Web-based Java application for remote management. And despite the superficial resemblance to the MMC, using MailSite's administrative console is far less complex than navigating the Active Directory and Exchange Server administrative tools. Once we figured out where the settings we needed were, managing users and server configuration was a breeze.

Better yet, Rockliffe includes an abundance of security features yet makes them very accessible. An SMTP security configuration wizard made it easy to ensure the server was appropriately configured both against obvious dangers such as providing an open relay and less obvious threats

such as denial-of-service attacks.

DHAP (Directory Harvest Attack Prevention) reduces spammers' ability to harvest valid e-mail addresses. MailSite also includes an integrated ActiveState anti-spam engine and the F-Secure antivirus engine (both of which are licensed on a recurring-annual-fee basis), as well as Sieve filtering and an extensive rules engine. (Sieve is a standard Internet filtering language that can block messages containing spam and viruses.) This constellation of easy-to-manage security features is one of MailSite's standout strengths.

The MailSite SE (small enterprise) edition we tested supports delegated administration and is available in versions supporting up to 500 users; larger installa-

tions, or those that want more advanced scalability features such as clustering, can step up to MailSite LE (large enterprise) or MailSite SP (service provider).

Companies looking for a basic e-mail server that's easy to install and manage will find MailSite SE a solid choice. If groupware or robust Web access are priorities, you'll want to look elsewhere.

Microsoft Exchange Server 2003

Server: Standard Edition, \$699 direct, Enterprise Edition, \$3,999; client, \$67 per user or per device. Microsoft Corp., www.microsoft.com/exchange.



Microsoft Exchange Server 2003 is an excellent choice for many businesses' e-mail and basic groupware needs—especially when combined with the

▶ You don't want to be held to a monthly fee and depend on a provider.

REASONS TO USE AN E-MAIL SERVICE

- ▶ Setup is quick and easy.
- ▶ You don't want to maintain server hardware.
- ▶ Your company doesn't have an IT expert.
- ▶ You have fewer than 200 users.
- ▶ You don't have the up-front cash to buy servers and software.

HOST CHOICES

These services typically include 100MB of mail storage.

eOutlook (\$7.95 monthly or \$89.95 yearly per mailbox, www.eoutlook.com.)

Inet7 Internet Services (\$14.95 monthly per user, www.inet7.com.)

Intermedia.NET (up to 9 mailboxes, \$15.95 monthly; more than 50 mailboxes, \$9.95 monthly).

MailStreet (two or more mailboxes, \$9.95 monthly per mailbox, www.mailstreet.com.)

NaviSite (basic managed Exchange or Domino service, \$12 per seat monthly and up; dedicated Exchange, \$8 to \$35 depending on requirements; dedicated Domino, \$9 to \$50; www.navisite.com.)

SPECIALIZED GROUPWARE HOSTS:

BlueTie Business uses its in-house-developed server software to deliver groupware. You can access it via Outlook, the Web, or a wireless device, and mail is filtered for spam and

viruses. (\$4.95 to \$19.95 monthly per user, www.bluetie.com.)

Critical Path offers e-mail, multimedia services, and even identity management solutions, such as directory integration, password management, and user provisioning. Its Hosted Messaging solution includes e-mail, shared calendar, spam filtering, address book, file sharing, and directory services. (\$3.85 monthly per user, www.cp.net.)

—Michael W. Muchmore

mail server lockdown

SECURITY COMES FIRST

Because your new mail server will become the collaboration hub for your business, the availability, integrity, and confidentiality of the information that flows through it is of paramount concern.

Our security checklist is very basic, but you can get more information on groupware security from CERT (Computer Emergency Response Team, www.cert.org) and SANS (the SysAdmin, Audit, Network, Security) Institute (www.sans.org). If you need to secure Microsoft Exchange Server 2000, the National Security Agency has an excellent set of guidelines at www.nsa.gov/snac.

▶ **Use antivirus software.** We prefer gateway antivirus that runs on separate hardware, because stopping the threat before it reaches your server makes the most sense. Solutions are available from GFI Software, Network Associates, Panda Software, Sophos, Symantec Corp., and Trend Micro.

▶ **Use antispam software.** Spam not only wastes your employees' time but also wastes precious server resources and may leave you open to a lawsuit. Again, we recommend a gateway solution such as CipherTrust or BrightMail, or a service such as Postini Perimeter Manager.

▶ **Deploy your groupware server in the DMZ.** Many viruses, blended threats, and attackers try to exploit e-mail systems available to the worlds both outside and inside your company. Carefully configured firewall rules shield your server from the outside world and shield users from the server should it be compromised.

▶ **Limit the size of attachments.** This is a simple way to prevent an e-mail bomb—the repeated sending of a large e-mail message—from taking down your system. Set the limit high enough that it doesn't interfere with employees' work but low enough so that you are protected. Many companies find somewhere

between 4MB and 8MB acceptable.

▶ **Limit the size of user mailboxes.**

This helps prevent e-mail bombs from using all of your hard drive space.

▶ **Disable all unnecessary services.**

Extraneous network applications running on groupware servers open security holes. Close them before they're exploited.

▶ **Minimize the number of administrators.** And make sure their accounts use strong passwords.

▶ **Disable relaying.** Most groupware servers will have SMTP relay off by default. But if they don't, your system could be exploited and used to send spam.

▶ **Monitor your system.**

If your system becomes sluggish, check the message queues. Is there a long list of e-mails from one sender (maybe even with a suspicious or spoofed address) clogging the inbound queue? Delete them and block the sender.

▶ **Read security bulletins** such as www.securityfocus.com. Apply patches to both OS and groupware servers ASAP.

▶ **Perform regular backups.** If you are attacked you can limit the impact on data loss and get running again sooner.

▶ **Fight back!** If you are subject to repeat attacks, then contact the ISP responsible for that range of IP addresses, the company whose network the address belongs to, and consider reporting the problem to the FBI (www.fbi.gov/contact/fo/fo.htm) or CERT (<https://irf.cc.cert.org>).

▶ **Educate users.** Last but far from least, teach your users what spam is and how they can try to avoid it by being selective about providing their e-mail addresses. Teach them that e-mail is typically a simple text file that can be intercepted and read. You may also want to evaluate secure messaging solutions such as Omniva's Disappearing Email (www.omniva.com) Sigaba-Secure (www.sigaba.com), or Voltage SecureMail (www.voltage.com).

—Matthew D. Sarrel



superb Outlook 2003 client. Microsoft has significantly enhanced Exchange's messaging infrastructure, deployment tools, and administrative capabilities. But we wish its initial installation and ongoing management were easier—an area in which Microsoft has made significant strides with its separate Small Business Server platform for companies with less than 75 seats. It also falls short of Lotus in collaboration tools and customization.

Microsoft says that half of Exchange Server 5.5 sites have never upgraded to Exchange Server 2000, in part because of the difficulty in migrating from Windows NT to an infrastructure based on Windows 2000 and Active Directory. Although Exchange Server 2003 improves the upgrade picture, moving directly from 5.5 to 2003 isn't an option unless you upgrade to Exchange 2000 as an interim step. One potential benefit is server consolidation: Microsoft says Exchange 2003 supports a much larger number of users per server.

Performing the required preparatory tasks and installing Exchange Server was among the most time-consuming setup processes we encountered. After we set up a primary domain controller and Active Directory, we had to go through an installation check list and run diagnostic tools. But Active Directory brings some clear benefits, too. You can do things like create dynamic distribution lists based on attributes of your users. Once the server is up and running, you administer Exchange through the familiar MMC (Microsoft Management Console) interface. While this approach is standard for Microsoft's server products, we'd still characterize it as a mediocre user experience. Performing even routine tasks means navigating through several tree branches and menus rather than using a task-based interface that puts common functions front and center.

Interface aside, Exchange administration *has* improved. Security settings are tighter by default. Better antispam capabilities are built in. In addition to basic spam-fighting capabilities, like real-time blacklists, Exchange includes a new Intelligent Message Filter, which helps identify unwanted e-mail. A variety of third-party vendors make antispam and antivirus plug-ins for Exchange, too.

Improved queue management gives a clear snapshot of the server's current

before you upgrade

FIVE THINGS TO CONSIDER

If your company is like most, you've already got an e-mail system in place, and you may need to decide whether to upgrade now or wait until later. Here are some points to consider before you open your wallet.

▶ Just because it's old doesn't mean it's broken. Unlike physical assets, software doesn't crumble and rust over time. Don't let yourself be forced onto the upgrade treadmill. And even though something is newer, that doesn't mean you need it right now—especially for a mature product category like e-mail servers. Of course, older versions may not have the security, stability, and even simple bug fixes that newer versions offer.

▶ What's the return on investment? An upgrade can be a major expense. In addition to the cost of new software licenses, it often means beefing up hardware, taking time to test and roll out the new products, training staff, and migrating data. What will the impact be on all the stakeholders in the process, from end users to administrators? You'll likely have to justify the up-front costs, perhaps by finding savings associated with site and server consolidations, improved licensing terms, better scalability, and reduced maintenance requirements. Work up a cost grid comparing your current expenses with the upgrade.

▶ What resources will your IT team need to commit?

Don't forget to assess pain points, such as the time it will take to get comfortable with new infrastructure requirements. For example, you'll need to understand Active Directory if you're upgrading to Exchange 2003.

▶ What tools are available to help? If an in-place upgrade isn't possible, what kind of tools will your vendor provide to validate configuration of the new environment and to migrate your existing mailboxes, distribution lists, and shared content to the new system? What kind of support is available? Consider



third-party tools that can ease the process, too. What's your fallback strategy if something goes wrong?

▶ Trade-offs?

An inline upgrade offers a quick path for a time- and resource-limited transition team. If something goes wrong, however, you won't have the deployment flexibility and cleaner rollback that an incremental pace allows. An incremental migration path that allows for a period of coexistence is more conservative than a rip-and-replace strategy, but you should still make a plan to deal with the coexistence of users, messaging, and public folders in two differing systems.—*Sahil Gambhir*

state, and if something is amiss, you can freeze queues or stop outbound e-mail. With the new Shadow Volume Copy service, you don't have to stop Exchange to back up, and it can now restore individual mailboxes. We also like Exchange Server's ability to set policies for individual recipients or entire servers, and a wizard that makes delegating administrative rights easy.

Outlook 2003 is a superb corporate e-mail client, and using it with Exchange Server exposes its full range of collaboration and mail management capabilities. In

conjunction with Exchange, Outlook now performs more client-side caching. This and a reengineered MAPI protocol should improve remote performance. Exchange can also now support RPC over HTTPS, meaning your users can work securely from a remote location without needing a cumbersome VPN, though we found configuration dauntingly complex. You need not upgrade clients immediately, though, as Exchange will still work with Outlook 2000. The newest version of Outlook Web Access is impressive, with drag-and-drop editing, mail rules, and an integrated spell-

checker. Outlook 2003 also adds client-side spam-filtering capabilities, such as the ability to right-click to add a sender to your blacklist, which extend those

The Outlook Web Access client is the best Web client we've seen, with capabilities that include drag-and-drop.

available on the server side.

With the 2003 version, Exchange Server no longer includes corporate instant messaging; that feature is now available in the separate Office Live Communications Server product. On the other hand, the formerly separate Mobile Information Server has been rolled into Exchange.

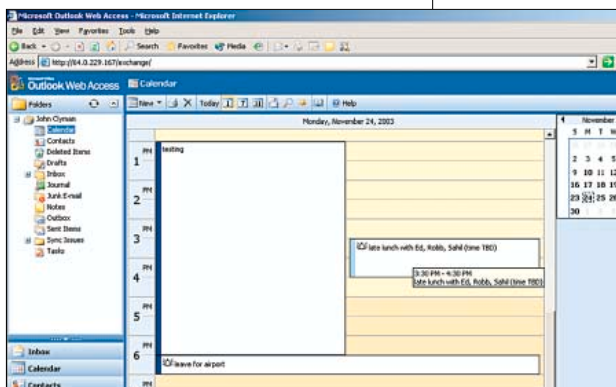
For many businesses with Windows-based servers, Exchange 2003 and Outlook 2003 is a winning combination.

Novell GroupWise 6.5

Client license, \$130 per user. Novell Inc., www.novell.com. ●●●●●

Novell GroupWise 6.5 is an end-to-end groupware system that combines a solid and scalable server platform with a capable and user-friendly e-mail client. GroupWise also includes document management and proprietary e-mail extensions, such as the ability to retract messages. But with relatively involved configuration and a dependence on Novell's eDirectory, GroupWise will appeal mostly to companies with an existing Novell-based infrastructure.

GroupWise most closely resembles



SUMMARY OF FEATURES

E-Mail and Groupware Servers

Download this table at
www.pcmag.com.

	CommuniGate Pro 4.1.7	IBM Lotus Domino 6.5	MailSite SE 6.0.6	Microsoft Exchange Server 2003	Novell GroupWise 6.5	SUSE Linux Openexchange Server 4.1
Typical pricing: 50 / 250 / 1,250 users (including servers and clients)	\$499 / \$1,999 / \$3,497	\$5,950 / \$29,750 / \$145,000	\$2,095 / \$6,993 / \$26,563	\$4,049 / \$17,449 / \$84,499	\$6,500 / \$32,500 / \$162,500	\$3,499 / \$10,749 / \$42,748
OSs supported	Solaris; Linux; Windows 95, 98, Me, NT, 2000, XP; FreeBSD; Tru64; MacOS X; AIX; IRIX; HP/UX; BSDi; UnixWare; AS/400; BeOS	Windows NT 4.0 (SP4), 2000; Solaris 8 on SPARC; AS/400, AIX 5.1 and 5.2; OS/400; IBM z/OS Linux	Windows 2000, Windows Server 2003	Windows 2000 Server, 2000 Advanced Server, Server 2003	Windows NT, 2000; NetWare 4.2, 5.1, 6.x	United Linux
Directory servers supported	Integrated, LDAP	AD (with ADSync), LDAP	AD	AD in Windows 2000 Server, Server 2003	NDS, eDirectory	Integrated server
INTEGRATED E-MAIL AND ADMINISTRATION						
Administrative interface:						
MMC snap-in/Command line	<input type="checkbox"/> ■	■ ■	<input type="checkbox"/> ■	■ <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> ■
Native GUI/Web-based	<input type="checkbox"/> ■	■ ■	■ ■	<input type="checkbox"/> <input type="checkbox"/>	■ ■	<input type="checkbox"/> ■
Distribution lists	■	■	■	■	■	■
By dynamic directory query	■	<input type="checkbox"/>	<input type="checkbox"/>	■	■	<input type="checkbox"/>
Auto-responders/Robots/Listservs	■ ■ ■	■ ■ <input type="checkbox"/>	■ ■ ■	■ ■ <input type="checkbox"/>	■ <input type="checkbox"/> <input type="checkbox"/>	■ ■ ■
Account aliases/quotas	■ ■	<input type="checkbox"/> ■	■ ■	■ ■	■ ■	■ ■
Diagnostic tools	■	■	<input type="checkbox"/>	■	■	■
Automatic server restart	<input type="checkbox"/>	■	<input type="checkbox"/>	■	■	<input type="checkbox"/>
View/halt all queues	■ ■	■ ■	<input type="checkbox"/> <input type="checkbox"/>	■ ■	■ <input type="checkbox"/>	■ <input type="checkbox"/>
Per-message logging	■	■	■	■	■	<input type="checkbox"/>
SNMP support	■	■	<input type="checkbox"/>	■	■	<input type="checkbox"/>
Delegated administration	■	■	■	■	■	<input type="checkbox"/>
Policy-based management	■	■	■	■	■	<input type="checkbox"/>
GROUPWARE AND ADVANCED CLIENT FEATURES						
E-mail search capabilities	■	■	■	■	■	■
Voice mail support	<input type="checkbox"/>	■	■	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Palm/Pocket sync	■	■	■	■	<input type="checkbox"/>	■
Supports shared:						
Calendars/Tasks/Folders	■ ■ ■	■ ■ ■	<input type="checkbox"/> ■ ■	■ ■ ■	■ ■ ■	■ ■ ■
Resources (like conference rooms)	■	■	■	■	■	■
Supports team rooms where you can define:						
Projects	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	■
Milestones	<input type="checkbox"/>	■	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Team documents	<input type="checkbox"/>	■	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	■
Members/Subteams	■ <input type="checkbox"/>	■ ■	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> ■
IM and real-time collaboration	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Follow-up flags	■	■	■	■	<input type="checkbox"/>	<input type="checkbox"/>
Unread e-mail view	■	■	■	■	■	<input type="checkbox"/>
Color coding of incoming messages	■	■	■	■	<input type="checkbox"/>	■
ANTISPAM						
DoS protection	■	■	■	■	<input type="checkbox"/>	<input type="checkbox"/>
Throttles outgoing SMTP	■	■	■	■	<input type="checkbox"/>	■
Creates custom blacklists	■	■	■	■	■	■
Creates custom whitelists	■	■	■	■	■	■
PROTOCOL SUPPORT						
ESMTP/Authenticated SMTP	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
S/MIME in native client	N/A	■	N/A	■	■	N/A
S/MIME in Web client	■	■	<input type="checkbox"/>	■	<input type="checkbox"/>	<input type="checkbox"/>
HTTPS (SSL) for Web client	■	■	<input type="checkbox"/>	■	■	■
RPOP	■	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SCALABILITY						
Clustering support	■	■	■	■	■	<input type="checkbox"/>
Splits mail stores across multiple files	■	■	■	■	<input type="checkbox"/>	<input type="checkbox"/>
Mailbox migration tools for:						
Exchange	■	■	■	■	<input type="checkbox"/>	<input type="checkbox"/>
Domino	■	<input type="checkbox"/>	■	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Novell	■	■	■	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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

IBM Lotus Domino 6.5 and Microsoft Exchange Server 2003. With basic collaboration, such as mail, calendaring, and task management, GroupWise is comparable to those products, except that GroupWise doesn't let you share personal contacts.

Setting up GroupWise was an involved process. As with Exchange Server, which also ties user administration closely into directory management, routine tasks such as adding users were more cumbersome than with other products here. But on the

plus side, both servers let you produce distribution lists from directory information, and compared with Exchange, GroupWise has a better track record for security.

GroupWise's server-side antispamming tools let you set thresholds for frequency of received messages to prevent mail-bomb attacks, and antivirus scanning is available via optional third-party plug-ins. We could right-click to add a message's sender—or an entire domain—to a list of trusted or blacklisted sites.

We like GroupWise's feature-filled yet uncluttered mail client, with niceties such as the ability to create titles for received messages, making them easier to find later. You can check whether recipients have viewed an e-mail and even retract it if they haven't. You can also recover information from your own mailbox backups, saving administrators time. If you'd still rather use Outlook, Novell has a MAPI plug-in for Outlook 2000.

Unfortunately, GroupWise Web

interview

IN THE MAIL-SERVER TRENCHES

As the chief technology officer and senior director of IT at the Mortgage Bankers Association (MBA), Sean Bagshaw oversees an e-mail system that serves 152 employees at the association's Washington, D.C., offices and handles regular traffic between 3,000 member companies. He estimates that more than 1.5 million e-mails are sent or received by the system each year. In December, he discussed his work as an e-mail administrator with *PC Magazine* senior writer Cade Metz.

PC Magazine: Is it safe to say that e-mail administration is far more difficult now than it was just a few years ago?

Sean Bagshaw: Absolutely. If you go back five or six years, spam wasn't a problem. Viruses weren't as widespread. An e-mail administrator did little more than add and delete users. Nowadays, you're forced to do far more work to ensure that mail is sent successfully and quickly, received successfully and quickly, that it's safe, that it's secure.

PC: Can you estimate how much spam you're getting?

SB: About 38,000 spam messages a month.

PC: Do many still slip

through into employee in-boxes?

SB: There have been a few instances where spam is coming through, where we haven't gotten the latest updates from Brightmail [an antispam service]. But this is very rare. There have been many cases where something came through that an employee thought was spam. But when we traced the message back through the chain, we found in most cases that the user signed up for, say, a newsletter and didn't realize that the message was from the same company.

PC: How about false positives?

SB: I know it sounds pretty incredible, but we haven't found one yet. Instead of merely blocking messages, we're redirecting them to a set of Exchange mailboxes and using Exchange rules to sort them. If users say they might have missed a message, we go back into these mailboxes to look for it. But also, on a weekly basis, we search for important messages, and we haven't found one.

PC: Do spam checking procedures ever slow things down?

SB: Not at all. Before installing IronPort [a mail server appli-

ance], we tested a couple of antispam software products that ran on top of our Exchange cluster. They added a fair amount of overhead to the system, and when they tried to do spam filtering, looking for keywords, they really put a drag on the system.

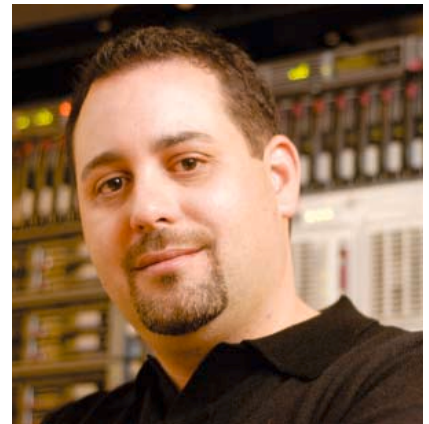
PC: How do you handle the virus threat?

SB: We use Sybari's Antigen. The antivirus game has gotten more and more difficult. You used to get your virus updates once a day and you'd be fine. Now, once an hour isn't always good enough. All it takes is one virus getting out and quickly propagating. We went with Antigen because it leverages multiple antivirus programs simultaneously, so if Sophos doesn't have an update for the latest virus, Kaspersky might catch it, and so on.

PC: Does this slow down your traffic?

SB: That hasn't been a problem. There's a little bit of a lag to it, but nothing like those spam apps we tested on our Exchange servers.

PC: Many businesses don't allow e-mail attachments. Do you?



SB: Yes. We send far too many attachments not to. All our press releases go out as attachments. We're constantly sending documents back and forth to our member companies. Our view is, we don't want to make anyone's job harder. As long as the attachment is scanned for viruses and it's in some standard format, we don't see them as a problem.

PC: Any advice for administrators who are just getting started?

SB: Do your research. We're constantly doing research to learn about new products. We're constantly making sure our technology is up to date. It's not "set it and forget it." It's something that needs to be refined and kept up to date. We spend a significant amount of time looking for anything new that may help us do our jobs or help our users.

Access lags behind the alternatives from Microsoft and IBM Lotus. While its features for managing mail are adequate and include filtering rules and a spell-checker, you'll want to stick with the installed client for real groupware functions. Instant messaging is new in this version of GroupWise, and many other enhancements in this latest version are hidden behind the scenes. A new API lets developers have programmatic access to the message store; componentization and modularization is promised for future releases. GroupWise supports clustering, delegated administration, and SNMP monitoring, and integrates a robust directory infrastructure.

The server currently runs on either NetWare or on Windows, with a Linux version due this spring. In late 2003, Novell announced plans to acquire SUSE, whose SUSE Linux Openexchange Server 4.1 is also included in this roundup; the companies have not yet finalized the merger or disclosed plans for its future groupware offerings.

Though there's no overwhelming rea-

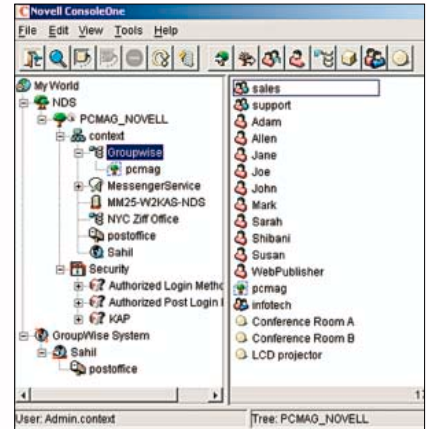
Administering a Novell GroupWise server means you'll have to become familiar with Novell's eDirectory.

son to switch from another groupware server to GroupWise, it delivers comprehensive features and remains a solid choice for Novell-friendly sites.

SUSE Linux Openexchange Server 4.1

Server, \$1,249 direct (including OS license); e-mail clients, free; groupware clients, \$249 and up for five users. SUSE Inc., www.suse.com. ●●●●●

SUSE Linux Openexchange Server 4.1's Web-based groupware capabilities are so good, your company might be able to use the Web interface exclusively. By doing this, you would avoid the cost and time of installing Microsoft Outlook and a plug-in on every employee's desktop. That's a distinct advantage over competing products in this roundup, such as CommuniGate and MailSite, neither of which has a viable Web-based groupware interface. What's more, installing and administering Openexchange is far



easier than with Microsoft Exchange or Novell GroupWise.

Openexchange is not without its limitations, however. The lack of a spell-checker in the Web client is a major omission. And larger or growing companies may be deterred by the absence of features like delegated administration.

Openexchange runs on Linux, but that alone shouldn't steer away administrators more accustomed to Windows. SUSE includes United Linux as an integral part of

Local

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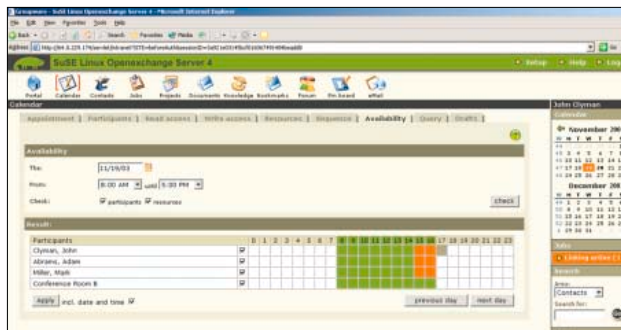


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SUSE Openexchange's Web interface offers access to extensive groupware capabilities, including shared calendaring.

bookmarks, and a pinboard for posting companywide notices. Openexchange lets you set granular permissions on items and link arbitrary items together to construct a simple Web-based knowledge management system.

Like CommuniGate Pro and MailSite, Openexchange includes an Outlook plug-in that lets you access groupware capabilities from within Outlook. But that means configuring each desktop in your organization individually, paying for Outlook licenses, and using only the groupware capabilities that Outlook supports—rather than the extra ones available via the platform-independent Web interface.

Openexchange includes a fax gateway, as well as an instant-messaging system of dubious usefulness, since it works only for Openexchange users within your company and can't interoperate with public IM networks. The server can also use SUSE's Samba interoperability programs to act as a file server for Windows clients.

For smaller companies that want Web-based groupware without installation and configuration headaches, or those seeking to adopt or expand a Linux-centric server environment, Openexchange deserves close consideration. ☰

the Openexchange package (the server's price of \$1,249 includes the underlying OS license), and the operating system is loaded and configured almost transparently at setup.

The Web-based administration interface puts most tasks and settings within easy reach, though some configuration, such as that for the included open-source antivirus scanner, requires you to edit text configuration files manually. While this is not overly difficult, it does imply a learning curve for administrators new to Linux. Similarly, the server's included Sieve filtering for antispam scanning requires you to construct rules manually.

Openexchange's Web-based client is excellent, even though it lacks slick interface extras, such as the DHTML in Lotus

Domino Web Access or the drag-and-drop you'll find in Microsoft's Outlook Web Access. When you log on, a portallike convenient summary of your personal information appears on a welcome page.

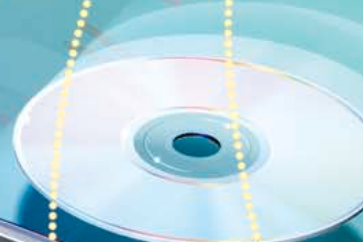
In addition to e-mail and groupware essentials like scheduling and shared contacts, Openexchange includes discussion forums, shared folders, project and task tracking, document versioning, shared

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- 3-D display
- MVA display
- IBM APS
- Synaptics SpeakerPad
- 9.5-mm DVD-RW
- 802.11 a/b/g wireless
- Dothan (Pentium M) CPU
- ExpressCard



What's New with Notebooks

BY BILL HOWARD • ILLUSTRATION BY NICK ROTONDO

Even when you're on the cutting edge of technology, as notebooks arguably are, entire system designs don't change overnight. Some of the biggest changes come in clusters, preceded by months of seemingly modest innovation.

Consider the first half of 2004 the calm before the storm. Incremental changes during these next few months will keep notebook technology moving along steadily. The Intel Pentium M processor will experience a speed increase, for example, and Intel will finally add 802.11a and 802.11g to its wireless offerings under the Centrino brand. More full-featured ultraportable notebooks that weigh less than 3 pounds will debut. And 9.5-mm optical drives will replace 12.7-mm ones, letting notebooks with such drives maintain a thickness of just 1 inch.

Later this year, things will get more interesting. A new chipset for the Pentium M, jam-packed with improvements and new technologies, will make its debut toward the end of the year. Intel will introduce a completely new bus architecture—something that happens only once or twice a decade. And a new protocol will finally put true meat on the bones of wireless security.

On the following pages, we take a close look at some of the most interesting and significant technologies that will rock the notebook world this year. In addition to the new Pentium M chipset and wireless security protocol, we look at cool innovations in displays, sound, and shock-proof computing. And we'll give you a peek at what's in store for 2005 and beyond. (If you're wowed by the battery life Centrino gives you, wait until you read this.)

IN THIS STORY • **98** A Faster, Better Processor and a Chipset that Does It All • **100** Wireless Reaches More and Gets a Security Boost • **100** ExpressCard: Superfast I/O • **102** Some Displays Get Brighter, With Better Viewing Angles • **102** Displays Go 3-D • **104** Rockin' and Rollin' Touch Pads • **104** IBM Hard Drives Stay Safe • **99** Beyond 2004: Seismic Shifts Ahead

A Faster, Better Processor and a Chipset That Does It All

Thanks to an ever-shrinking gap between notebook and desktop performance, more people are choosing notebooks. In fact, roughly one-third of home users will be using notebooks by 2007, according to research firm Gartner. And the performance gap is about to shrink even more with the arrival early this year of the second-generation Intel Pentium M notebook processor, code-named Dothan.

The first-generation Pentium M, code-named Baniyas, arrived early last year as the brains behind the much-hyped Centrino systems. Baniyas proved that an efficient mobile processor running at half the speed of a desktop CPU could generate impressive performance and battery life (upwards of 4 hours).

DOTHAN DIFFERENCES

The second-generation Pentium M, Dothan, will have the same chip packaging and bottom connectors as its predecessor.

Dothan, however, will use a smaller and more efficient manufacturing process with circuits just 90 nanometers wide, as op-

posed to Baniyas's 130-nm (or .13-micron) process. This lets Dothan's smaller circuits draw less power and run faster, because the distances signals travel are shorter.

Dothan's on-board Level 2 (L2) cache is 2MB, double that of Baniyas. The cache "speculates" what information the CPU will want next and draws that from the system memory. The Level 1 (L1) cache is the first place the CPU looks for and stores the most frequently used L2 material. There is a downside to ever-bigger caches: When the data isn't in the L1 or L2 cache, there's more cache to search before the computer looks elsewhere (system memory or the hard drive), and that means longer lag times.

POTENTIAL FOR CONFUSION

A sometimes overused determinant of processor performance is clock speed. Dothan's clock speed will be 1.7 GHz—the same speed at which Baniyas tops out, which means that both could be on the market simultaneously, with the same speed and the same name of Pentium M. But Dothan will perform better than Ba-

nias because of the differences in design.

Buyers will have to look carefully to tell the two CPUs apart. For any Pentium M chips that overlap in speeds, there will be an *A* suffix for Baniyas and a *B* for Dothan (for example, Pentium M 1.7A will indicate a Baniyas chip, and Pentium M 1.7B will signify Dothan). Expectations are that the Dothan version of the Pentium M will reach at least 2.7 GHz by the end of 2004. Dothan will also be identifiable by its increased cache.

A NEW CHIPSET

The Dothan notebooks that will begin shipping early this year will contain many of the existing Baniyas components, particularly chipsets and graphics adapters. But later this year we expect to see an even more powerful Dothan notebook, which will be armed with a new chipset code-named Alviso.

Alviso will support a new type of system memory called DDR2, which is estimated to support transfers that are one-third faster than those seen today—533 MHz compared with 400 MHz—although it may not reach those speeds initially in notebooks. Alviso also will debut a new system bus, or data path, called PCI Express, which is nearly twice as fast as the existing PCI bus. (For more on PCI Express, see page 100.)

Hard drives have quickly crept past 5,400 rpm to 7,200 rpm. Alviso will also be able to support these through a faster connection called Serial ATA (SATA), which is new in the mobile space.

Alviso will also have faster graphics subsystems built in. And in acknowledgment of the strong trend toward multimedia, Alviso will even provide surround-sound (not just stereo) audio.

MOBILE COMPETITION

In contrast to Intel's lead in shrinking circuitry from 130 nm to 90 nm, AMD will continue to forge ahead with 64-bit computing for the mobile platform. *64-bit* refers to the ability to process vastly more data and address far more memory than the current 32-bit microprocessors.










The AMD Athlon 64 came on the desktop scene in 2003, and the AMD Mobile Athlon 64 will make its way into more notebooks in 2004. Best for PC

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Centrino vs. Centrino

Intel will significantly build on its chipset this year.

2003 Centrino platform		2004 Centrino platform
Baniyas/855GM/GME/PM chipset DEBUT: March 2003		Dothan/Alviso chipset DEBUT: Second half of 2004
130-nanometer chip with 1MB L2 cache		90-nanometer chip with up to 2MB L2 cache
Intel Extreme Graphics 2		New engine for integrated graphics with optional discrete graphics
Memory with DDR support		Next-generation memory with DDR2 support
PC Card support		Next-generation I/O and expansion (PCI Express and ExpressCard)
Integrated 10/100 Ethernet		Integrated Gigabit Ethernet
Standard IDE hard drive support		Serial ATA hard drive support
Data Encryption Standard (DES)		Advanced Encryption Standard (AES)
Calexico wireless chipset with 802.11b capability		Calexico II wireless chipset with triband 802.11a, 802.11b, and 802.11g capability
AC '97 audio interface		Azalia audio interface

enthusiasts, gamers, multimedia mavens, and digital designers, this heavyweight chip is targeted more at desktop replacement PCs. The general problem with 64-bit computing is that there isn't much software to take advantage of it yet. The company's mobile mainstream 32-bit AMD Athlon XP-M won't change much until 2005, when it will shrink its circuitry to 90 nm.

Transmeta has carved out a niche sell-

ing low-power Transmeta Crusoe processors. That chip's successor, the Transmeta Efficeon TM8000 series, claims to come closer to the power of the Pentium M (Baniyas). The first chip in this series, the Efficeon TM8600, is built on a 130-nm process, runs at 1.1 GHz and offers an integrated graphics interface. Transmeta chips are found mostly in Europe and Asia, and the company's biggest challenge is to move into the mainstream, be-

yond small tablets, new ultrapersonal computers, and some blade servers.

The arrival of Baniyas last year, the improvements built upon it with Dothan this year, and the pending arrival of the new Alviso chipset have kept mobile processing moving along at an impressive clip. And healthy competition from AMD in the desktop replacement arena and Transmeta in the ultrapersonal computer space makes for interesting innovation.

Beyond 2004: Seismic Shifts Ahead

If notebooks are your primary computing choice, then the next few years will be good to you. In the 2005-to-2008 time frame, batteries will provide all-day power, a mini-renaissance in display technologies may be on the way, and a few other aspects of notebooks will shift radically.

FUEL FOR THOUGHT

All-day power has long been the Holy Grail for notebook computing. Toshiba has already demonstrated a prototype methanol fuel cell that can power a notebook for 5 hours. Such cells contain a small cartridge of methanol and convert chemical energy directly into electricity, with the byproducts being oxygen and water. Toshiba's notebooks will include these cells this year, and by 2005 or 2006 the cells will be able to run notebooks for 8 hours, Toshiba says. NEC has developed similar technology, with plans to ship this year.

Meanwhile, Neah Power Systems—with an investment from Intel—has developed a silicon honeycomb design for its fuel cell's electrode, which, by increasing power density, allows for a much smaller size than previous fuel cells. Shipping products should arrive next year.

On the far horizon, NEC has discussed advanced fuel cell technology for notebooks that could provide 40 hours of continuous power.

ON DISPLAYS

Imagine inexpensive, very cool notebook displays rendered on—of all things—plastic. Such displays are poised to arrive in notebooks in the next five years, thanks to organic light-emitting diode (OLED) technology. OLED displays use custom-designed organic molecules that sit on top of the screen, forming a film that enhances brightness and color by emitting light when an electric current passes through it.

Kodak is already shipping a digital

camera in Europe with a bright OLED display, and numerous other companies are working on such displays for portable devices. DuPont's Olight division has more than 200 scientists working on flexible plastic OLED displays. Meanwhile, players such as Cambridge Technologies and Universal Display Corp. have come up with OLED designs for plastic displays that pull out of a device as you might pull down a window shade, as well as designs for sliver-thin notebooks.

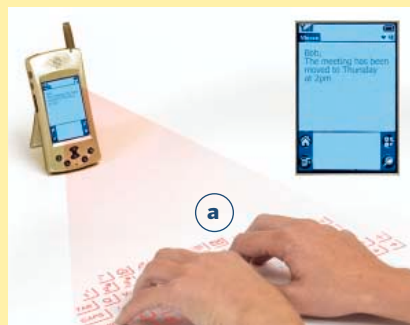
Part of the promise of OLEDs is notebook price reduction, but a less glamorous display technology may have the same effect before OLEDs arrive. Palo Alto Research Center (PARC), for Xerox, has developed a plastic semiconductor transistor array that is made using jet printing. The process involves depositing plastic or organic integrated circuits by spraying them onto a surface with an ink jet-like device.

Xerox claims the technology will significantly lower the cost of active-matrix displays by replacing vacuum deposition and photolithography. Rollable displays, which might be accompanied by a lightweight computing device, could also benefit from this technology.

EVER MORE PORTABLE

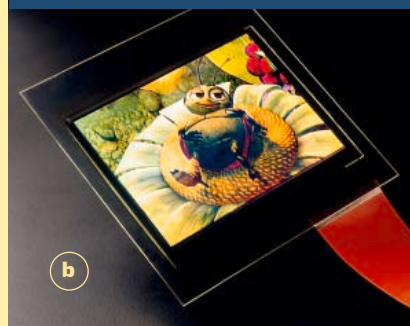
Some very exotic notebook technologies are also in the pipeline. Canesta, among other companies, is focusing on projectable keyboards, so that portable devices don't need physical keyboards. An image of a full-size keyboard is projected onto a physical desktop, and a sensor inside the portable device can observe which keys you press and communicate that information to software. As these technologies head out of the lab and into portable computers, they will help give notebooks even more market muscle to compete with desktop PCs—and so will increased storage capacities and svelte new designs.

—Sebastian Rupley



a. Let your fingers do the talking with a projectable keyboard.

b. Displays made from plastic will literally be paper thin.



Wireless Reaches More and Gets a Security Boost

BY BILL HOWARD & CRAIG ELLISON

From a wireless perspective, 2003 was a big year for notebooks. Though built-in wireless technology began appearing in notebooks in early 2002, it finally caught on last year, thanks in part to Intel's massive wireless campaign and launch of Centrino, the company's three-part wireless solution. This year, we will finally see Centrino—a late arrival to the party—get up to speed on wireless support. And more notebooks will include built-in support for all three wireless standards: 802.11a, 802.11b, and 802.11g.

Intel launched Centrino last year with an old technology, 802.11b, while other wireless chipset manufacturers, including Atheros, Broadcom, Globespan/Verata

(formerly Intersil), and Texas Instruments, were already providing notebooks with 802.11a and 802.11g technologies. These companies have long been providing chips and reference designs for 802.11a/b, 802.11b/g, or 802.11a/b/g designs for the internal Mini PCI form factor. Intel will make its first 802.11a/b solution available in the first quarter, 802.11b/g sometime in the first half of the year, and 802.11a/b/g in the second half of the year.

Also on the horizon is a faster wireless standard, 802.11n, which claims to double the speed of "g." This will show up first in PC Cards, then in Mini PCI cards.

Aside from just wireless capability, what consumers really need is technology that will connect them to whatever

wireless network they encounter, whether it's "a," "b," or "g." For those who can't wait for their preferred notebook manufacturer to provide built-in "a/b/g" capabilities, PC Card adapters supporting all three standards are already available.

Products with improved wireless security based on the 802.11i specification, which is expected to be ratified in mid-2004, will become available late this year or in early 2005. WPA (Wireless Protected Access) is the current interim security standard and is based on 802.11i. This will go away once 802.11i arrives. The good news for consumers is that the wireless chipsets that are already shipping will support the new security standards with simple software and firmware upgrades.

ExpressCard: Superfast I/O

The standard PC Card slot that has been found on the sides of notebooks since 1991 is wearing out its welcome. The PC Card has finally been surpassed by faster technologies, such as Gigabit Ethernet and FireWire. And the increasingly popular HDTV would choke on PC Card throughput.

Enter ExpressCard, a smaller, faster, cheaper solution. ExpressCard will have the theoretical maximum throughput to transfer data at a whopping 250 MBps (actually, 500 MBps total; 250 MBps to the computer in one direction and 250 MBps to the card in the other). This is in comparison to the now seemingly sluggish 132-

MBps PC Card standard.

ExpressCard's throughput is ideal for video transfers and uncompressed files. To compare it with throughputs you're familiar with: Gigabit Ethernet has a throughput of 125 MBps, FireWire 800 (seen only in new Apple notebooks so far) runs at 100 MBps, and USB 2.0 can reach 60 MBps.

SAME BUT DIFFERENT

There will be two sizes of ExpressCards, varying only by width: ExpressCard/34 (34 mm wide) and ExpressCard/54 (you guessed it: 54 mm wide). They'll both be 5 mm thick, as is the popular Type II PC Card. Two ExpressCard/34s or one

ExpressCard/54 will fit into a slot not much wider than the one a single PC Card occupies today.


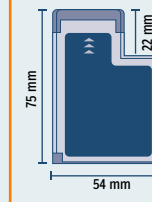
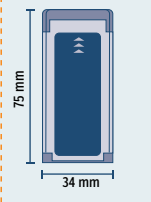
There's no mechanical ejector button like the ones on PC Card slots, which tend to snag and break. Instead, an ExpressCard will jut out a little over half an inch, so you can easily pull it out with your fingers.

WE GO TOGETHER

ExpressCard can't attain its top speed of 250 MBps without the upcoming PCI Express bus technology. This has the same bandwidth potential as ExpressCard: 250 MBps in each of two directions, reaching up to 4 GBps in future iterations. It succeeds PCI, which topped out at 132 MBps (total, both directions).

The ExpressCard specification requires connection compatibility with USB 2.0, which is standard on most current notebooks. This will be handy for external USB readers used with older notebooks. And a PC Card adapter for ExpressCard/34 only will be available for notebooks with PC Card slots.

On notebooks, PCI Express will be part of the upcoming Intel Alviso chipset. But some notebook manufacturers predict that systems containing all three—Alviso, PCI Express, and ExpressCard—won't be available until early 2005.

PC Card vs. ExpressCard	PC Card*	ExpressCard/54	ExpressCard/34
The differences in ExpressCard technology allow for much faster throughput in a design that is much slimmer than the PC Card.			
Size (HWD, in mm)	5 x 54 x 86	5 x 54 x 75	5 x 34 x 75
Connector pins (and port type)	68 (parallel)	26 (serial)	
Connector type	Pin in socket	Beam on blade	
Bandwidth	132 MBps	Via ExpressCard connector, 250 MBps each direction; via USB 2.0, 60 MBps	
Removal method	Mechanical	Manual	

* 32-bit CardBus, Type II.

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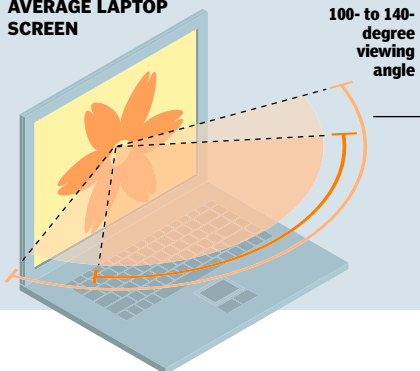
I shop online
after closing
my office door

Some Displays Get Brighter, with Better Viewing Angles

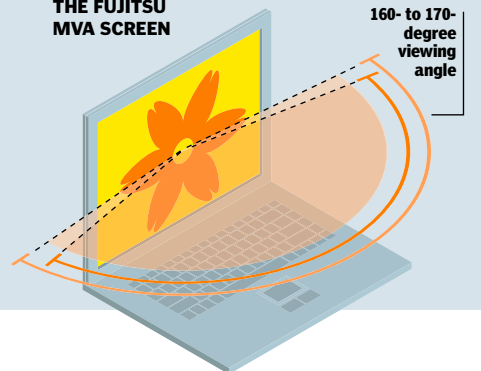
See To Believe

A typical notebook screen has a viewing angle of 100 to 140 degrees. With Multi-Domain Vertical Alignment (MVA) display technology, the viewing angle is wider, at 160 to 170 degrees. Screens with MVA display technology also produce crisper, sharper images.

AVERAGE LAPTOP SCREEN



THE FUJITSU MVA SCREEN



Some of the most frequent complaints about notebook displays have typically been poor viewing angles, inaccurate colors, and nonuniform brightness. A wide viewing angle is important, especially for people who are gathered around a notebook to view a presentation or watch a DVD movie. Fujitsu has developed one of the most promising screen technologies for bright, wide-angle viewing: the MVA TFT display, which the company has debuted in its Fujitsu LifeBook N Series notebooks. (Fujitsu licenses MVA to other manufacturers.)

TFT (*thin-film transistor*) is the most commonly used display type, sometimes called *active-matrix*. MVA (*Multi-Domain Vertical Alignment*) is a method of angling the liquid crystals in a TFT display so that the screen remains uniformly bright and the colors stay true over much more of the viewing angle—up to 170 degrees, or 85 degrees on either side of center. In comparison, other displays have viewing angles that range from 100 to 140 degrees.

Another tangible benefit of MVA is a relatively fast refresh rate of 25 milliseconds or less. Slow refresh rates result in smearing when you're watching videos or playing games.

The liquid crystal molecules are angled in more than one direction within the cells that make up each pixel, typically in two or four *domains*, or regions—hence the *Multi-Domain* part of the name. The *Vertical Alignment* part comes from a series of vertical ribs between the

LCD panel and the glass that help the crystals align. With molecules oriented in several directions, the image remains bright until you're almost looking at the side of the panel.

MVA technology is currently used only

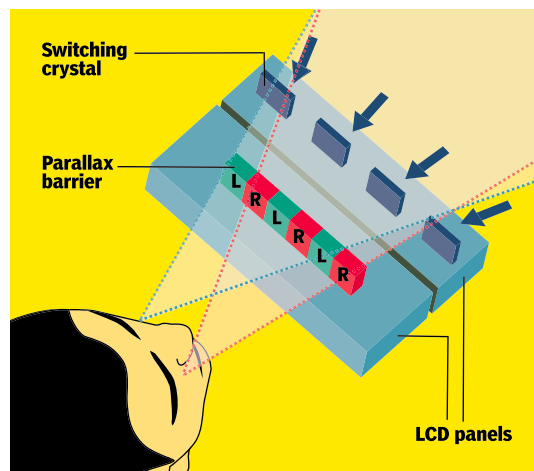
in heavier notebooks, like desktop replacements. There is a slight glare issue that hinders it from making its way into lighter, more mobile notebooks. But in a stable working environment, MVA displays outclass typical notebook screens.

Displays Go 3-D

Though it sounds unbelievable, you can now view crisp 3-D images on some notebooks—sans special glasses—without missing a pixel in 2-D. Sharp's proprietary technology, which debuted late last year on the Sharp Actius RD3D and will ship on other manufacturers' systems this year, lets you view images in 2-D or press a button and see them in 3-D.

To render 3-D images, a 3-D display uses two 15-inch LCD panels that sandwich a parallax barrier. (*Parallax* refers to the difference between what your left and right eyes see, which the brain interprets as 3-D information.) The front panel is a standard 15-inch XGA (1,024-by-768) color display, which is always in use.

To see images in 3-D, the rear panel, which is monochrome-only, must also be engaged. Odd-numbered pixels from 1 to 1,023 create an image for the left eye, while even-numbered pixels from 2 to 1,024 are



devoted to the right eye. The combination of these two sets of pixels, the parallax barrier, and the light path through them form a 3-D image. (For more on this, see First Looks, December 30, page 40.)

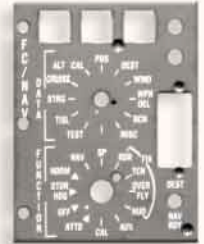
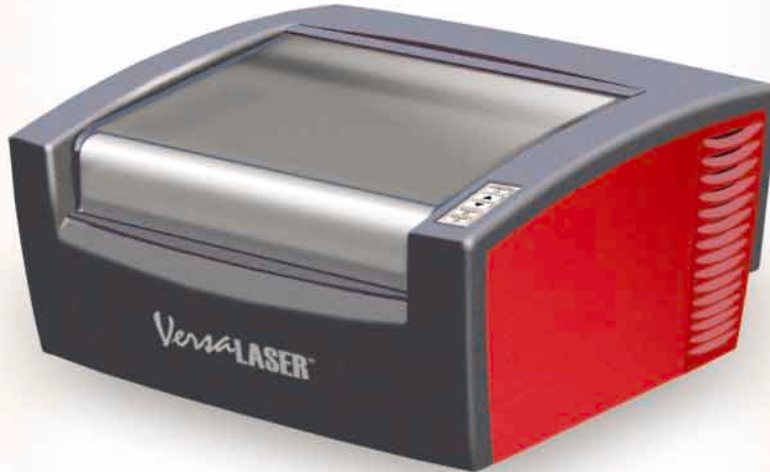
This technology is in its infancy; a notebook with a 3-D screen will cost more than a standard one. But the possibilities for artists, architects, doctors, and even gaming enthusiasts are endless.—BH

Our contributors: **Bill Howard** is a contributing editor of *PC Magazine*. **Craig Ellison** is director of operations at PC Magazine Labs. **Sebastian Rupley** is a senior editor. Associate editor **Jenn DeFeo** and PC Magazine Labs project leader **Joel Santo Domingo** were in charge of this story.

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Rockin' and Rollin' Touch Pads

The ongoing quest to downsize notebooks inevitably leads to sacrifices. Touch pad maker Synaptics doesn't think audio quality should be one of them. The solution: Let your touch pad double as a sound-radiating panel with two channels of audio. In other words, your touch pad becomes your flat-panel stereo speaker set; you can scroll and type with it while you're listening to MP3s, and the sound is impressive.

Appropriately dubbed the Synaptics SpeakerPad, this dual-purpose technology is likely to show up on ultraportables and thin-and-light notebooks this year. The underlying technology comes from NXT, a British firm known for its high-quality flat-panel desktop speakers.

The SpeakerPad is best described as a typical touch pad with a hidden flat speaker. But the speaker is not so typical; it sounds much better than your average tinny speaker found on such small systems. The magic is in its piezoelectric elements—crystals that vibrate when you apply electricity to them (or that give off electricity if you twist them). Such crystals are used for various types of technologies; for example, Epson printers use

them to force ink from the heads and onto paper.

In the case of the SpeakerPad, the crystals flex or vibrate to an audioelectrical signal. This produces sound waves that travel through not only the touch pad but also the surrounding palm rest. The result is radiating music, in stereo, from a speaker that takes up very little space. But be forewarned: Because the palm rest vibrates to create the music, your hands will experience a slight tingling sensation that takes some getting used to.

Though not as high-performing as traditional speakers in larger desktop re-

placement notebooks, the SpeakerPad is a big step up for ultraportables.

Synaptics' innovations with touch pads don't end with the SpeakerPad. The company is also breaking new ground in pointing technology with the Synaptics RoundPad, a circular touch pad. Modeled after the Apple iPod's scroll wheel, which Synaptics created, the RoundPad has a raised lip around the edge. Start at three o'clock on the lip and the screen scrolls up or down, depending on your finger's direction. From six o'clock, it scrolls wide screens left or right. From other positions, it functions as a touch pad.

IBM Hard Drives Stay Safe

Your hard drive is the keeper of all your information—data, programs, and everything else. The more mobile you are the better the chances that you could accidentally drop your system and damage it. But a new IBM technology promises to safeguard a notebook's hard drive—fractions of a second before it hits the ground.

All notebook hard drives are already shock-mounted on rubbery or gel-filled washers and corner pads, and energy-absorbing cases help cushion the blow of a fall. But these can only protect a hard drive if the drive head is parked and not in operation.

If a drive head is reading or writing data on the disk as a notebook is falling, it can scratch the disk and damage or destroy the data. That's where the IBM Active Protection System (APS), found on select ThinkPad R and T series notebooks, comes in: It anticipates disasters before they happen. A built-in sensor detects a notebook's sudden downward acceleration, and within a fraction of a second, it parks the drive head and shuts down all hard drive activity.

The technology smartly distinguishes between a momentary bounce and a sustained fall, and you can calibrate it to ignore bounces during, say, a turbulent plane ride or a drive down a bumpy road. That way, your hard drive isn't constantly shutting down throughout your trip.

So far, IBM hasn't said whether it will make the technology available to the rest of the notebook industry. A decade ago, it licensed its best-in-class TrackPoint pointing stick after competitors that tried to work around IBM's patent portfolio were giving all pointing sticks a bad name. So who knows? Failed APS knock-offs could lead this technology to become an industry standard in the future. Stay tuned. ☰



(top) The SpeakerPad uses a unique design to enable quality sound to come from your touch pad. (bottom) Some people find the RoundPad easier to navigate pages with.

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Maximum RAID 0 Capacity	2.5 Terabyte	3.0 Terabyte	3.0 Terabyte
Maximum RAID 1 Capacity	1.25 Terabyte	1.5 Terabyte	1.5 Terabyte
Maximum RAID 5 Capacity	2.0 Terabyte	2.5 Terabyte	2.75 Terabyte
Maximum Single Array Size	2.0 Terabyte	2.0 Terabyte	3.0 Terabyte
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Intel® Processors	Dual Xeon® 2.4GHz 533MHz FSB - 512KB Cache	Dual Xeon® 2.4GHz 533MHz FSB - 512KB Cache	Dual Xeon® 2.4GHz 533MHz FSB - 512KB Cache
ECC Registered Memory	2GB DDR266	2GB DDR266	2GB DDR266
RAID Environment	3ware® Escalade™ 8506-12	3ware® Escalade™ 8506-12	Windows® Storage Server 2003
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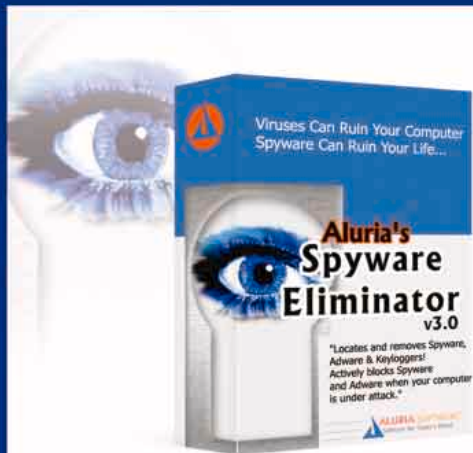
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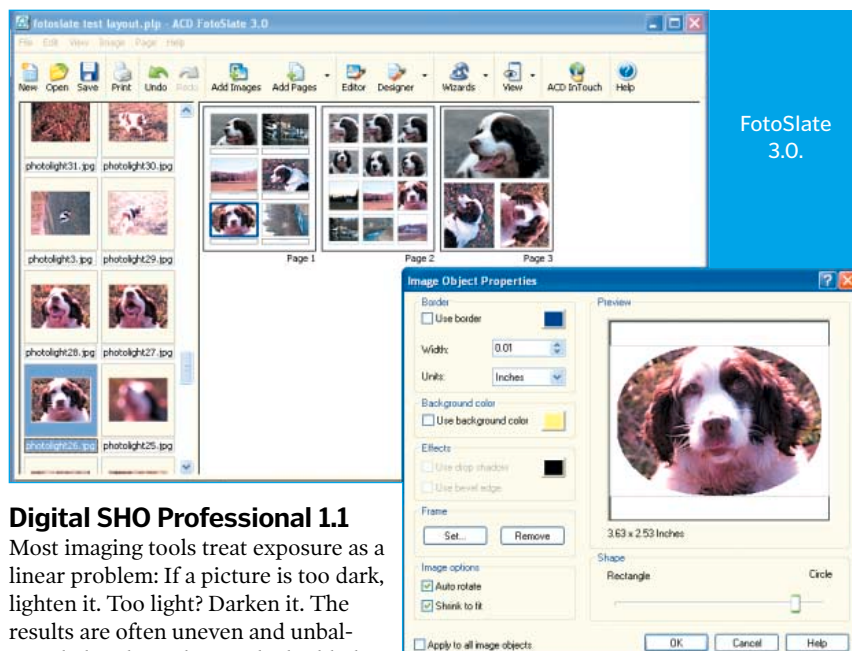
Photo Finishers

BY SALLY WIENER GROTTA

Most digital photographers, whether they are experienced or have just begun to experiment, eventually want to venture beyond the limited capabilities of the software that comes packaged with digital cameras. You can find plenty of standalone programs for the basics—editing, sharing, and managing—but there are also lots of software utilities available for snazzing up your digital photos, and more are appearing all the time. With such a dizzying variety, separating the valuable from the trivial isn't easy. To help you out, we've selected six of our favorites from this crowded field. Each provides useful tools that are not only easy to use but don't get in the way of essential tasks.



Digital SHO Professional 1.1



FotoSlate 3.0.

Digital SHO Professional 1.1

Most imaging tools treat exposure as a linear problem: If a picture is too dark, lighten it. Too light? Darken it. The results are often uneven and unbalanced; details are lost in the highlights and shadows, and visual noise can become excessive. Digital SHO Professional 1.1 (the newest version of the excellent Adobe Photoshop plug-in) avoids these problems by using sophisticated algorithms to tweak highlights and shadows independently.

Although the Help menu provides pragmatic guidance, you don't really have to understand how SHO works to use it effectively, and experimenting with the controls provides an intuitive lesson. Four sliders control the amount of

detail in shadows and highlights, how much of the light and dark areas are affected (threshold), and color saturation. The zoomable preview can show the original image, the current edit, or the black-and-white threshold view. A smaller view of the original image in the upper right corner helps you navigate when the preview is zoomed in. SHO handles the data from digital captures differently than scanned pictures originally shot with film, bringing out the best in each.

SHO transformed dark or dull pictures into vibrant, colorful, and superbly exposed images. Although the price is rather high, if you have important photos that you can't reshoot, Digital SHO Professional 1.1 works better than any other similar tool we've used. \$99.95 list; upgrade, \$49.95. Eastman Kodak Co., www.asf.com. ●●●●●

FotoSlate 3.0



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This may be a digital world, but people still want hard copies of their photos. Desktop printing can be frustrating, though; you must decide on the size of your print, then save a resized version of the photo. And to save money on ink and paper, you'll often want to print more than one photo per sheet. ACD Systems' FotoSlate 3.0 can help, delivering speed, convenience, and quality. The interface is easy to learn for novices and flexible enough for pros.

FotoSlate ships with over 450 page layouts for the most common photo sizes on various-size paper, as well as templates for projects such as note cards, calendars, and t-shirts. You can also design a page layout for any-size paper, with precise control over placement and size of the photo placeholders. You can decide whether to resize and rotate images or use artistic borders, beveled edges, and shadows in your prints. A slider lets you set the shape of the photo, from rectangular to curved corners and ovals.

To use FotoSlate, simply load the images you want to print, choose templates, and drag the photos into the placeholders. Print output is excellent even with automatic resizing, which in some other programs degrades image quality. FotoSlate is our personal favorite printing package for cranking out lots of photos. \$39.99 list. ACD Systems of America Inc., www.acdsystems.com. ●●●●●

ImageRecall 2.0



MAGAZINE
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Losing cherished digital photos is all too easy. One wrong move and that perfect shot might be gone forever. ImageRecall 2.0 is a simple but powerful wizard-driven utility that can recover images—as well as audio, data, and video files—from any kind of removable memory card. Recov-



ImageRecall 2.0

ered files are saved to a folder on your computer's hard drive or burned directly to a CD, while the original data on your media card is protected. This new version of ImageRecall can also check your memory card for errors and perform a secure erase to remove all data.

A similar program that also works well is LexarMedia's Image Rescue (\$39.95, www.lexarmedia.com). But ImageRecall is risk-free. Download the trial version from www.flashfixers.com;

it will recover up to ten images from a memory card. If the software does not work on your card, you can send it to FlashFixers Image Recovery Labs, which will attempt the recovery using more-advanced tools. The lab fees start at \$59.95 for a 16MB card, but if the lab fails, you're charged only \$10 for shipping and handling.

Of course, no image-recovery software is guaranteed to work every time, but ImageRecall gives you a fighting chance to save those important memories. \$39.95 list. FlashFixers, www.flashfixers.com. ●●●●●

PhotoLightning 2.5

One of the common difficulties people have with digital photography is getting pictures off their cameras and onto their computers. PhotoLightning 2.5 can automatically upload pictures from a camera or memory card and gives you control without fuss. For instance, you can designate where the pictures are saved, how the folder is named, whether uploaded pictures are deleted from the camera or card, and whether previously copied pictures will be prevented from being uploaded again.

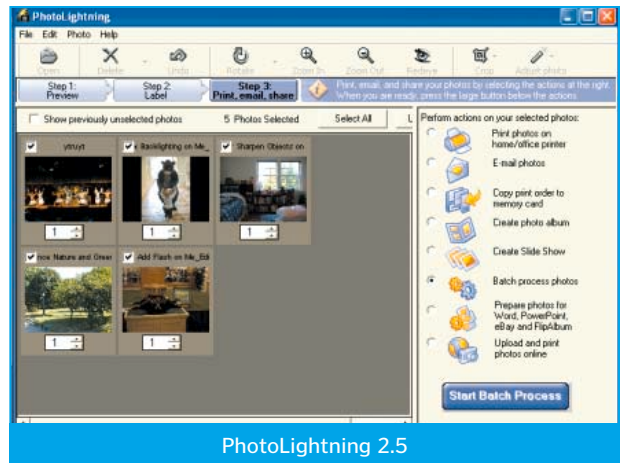
If that were all PhotoLightning did, it would be a worthy utility. But it also makes short work of other typical tasks. The main interface displays all your photos—or just those in a specific folder—in chronological order. Click on a thumbnail to display a large preview image, which you can quickly correct for exposure,

color, red eye, rotation, and sharpness. These one-click auto-fixes aren't high-level editing, but they work well for what they are.

You can easily prepare and resize selected photos for use in Microsoft Office, in FlipAlbum, on eBay, in print, in an e-mail, or in a slide show. But unfortunately, to do any kind of batch processing, you have to click over to a different area of the program rather than wherever you are making the change,

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PhotoLightning 2.5

which can be confusing. (The company plans to address this issue.) Currently, upgrades are free for registered owners.

In essence, PhotoLightning lives up to its name. It excels at speedily getting photos onto the computer, organizing them, and using them.

\$39.95 list. PhotoLightning, www.photolighting.com. ●●●●●

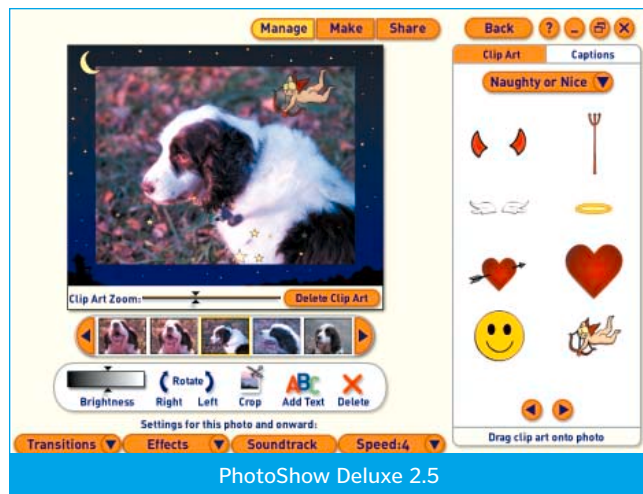
PhotoShow Deluxe 2.5

Even novices can make strikingly fun multimedia slide shows with Simple Star's PhotoShow Deluxe 2.5. The program also offers basic organization and editing tools, and navigating the program's three sections—Manage, Make, and Share—is a breeze.

When you start PhotoShow, it scans your computer (as well as connected memory cards and digital cameras) to import your photos, though it doesn't maintain nested folders. In the Manage section, you can caption photos and organize

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PhotoShow Deluxe 2.5

them by category and keyword for easy search and retrieval.

In Make, where you can order online printing and photo novelty gifts, you'll find simple slide show tools, including titles, frames, transitions, animated clip art, and music. In Share, you can e-mail links to your photos online (hosted free at www.photoshow.net), burn a CD or VCD, create a screensaver, save your photos to HTML, and create an EXE file that can be viewed by anyone.

The editing interface is basic, but it delivers most of what the amateur photographer needs. For home printing, PhotoShow lays out selected photos according to size as thumbnails on a proof sheet or on a number of Avery label sizes. Like everything else in PhotoShow, the print layout is very easy to use. Just don't expect your slide show to look like a Hollywood production. \$49.99 list; theme clip-art packs, \$9.99 each. Simple Star Inc., www.simplestar.com. ●●●●●

SoundPix Plus 2.0

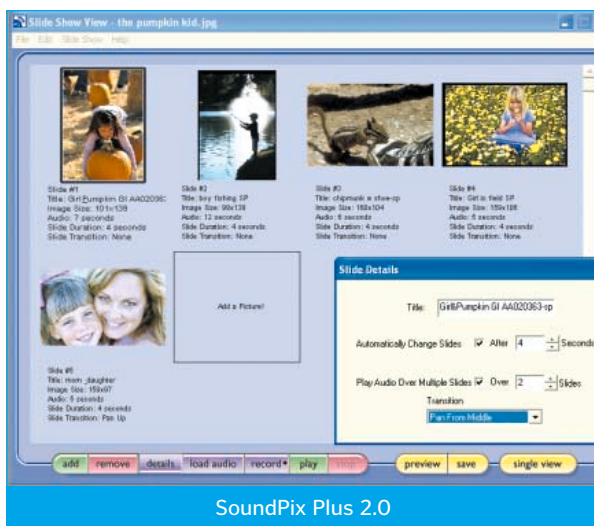
A picture may be worth a thousand words, but adding words, music, and other sounds really makes a photo come alive. Despite a few rough spots, SoundPix Plus 2.0 is an easy-to-use, fun application for embedding sound in photos and slide shows.

Start by loading one or several photos; the program accepts a wide variety of formats. You can record sounds yourself using the program's interface or import sound from a WAV, AU, or MP3 file. Then

the lower right corner of a photo, but only in black ink, which can be unreadable on a dark background. Although the interface is intuitive, it suffers from the lack of a Help menu (which is promised for Version 2.1).

Slide shows are saved as complex JPEG files with embedded sound. Of course, the audio inflates the size of the files. One option lets you compress the sound, which shrinks the file size by half, but the downside is that you must do this for each picture, one at a time.

If you e-mail a slide show, the recipient gets a link to download the required



SoundPix Plus 2.0

Internet Explorer plug-in for viewing and listening to the show.

The advantage of SoundPix over other ways of coupling of sound with pictures is the single resulting file for both media. Unfortunately, the program's simplicity doesn't allow enough control over effects, fonts, and hyperlinks.

\$39.95 list. SoundPix, www.soundpix.com. ●●●●●

you associate the sound with a specific photo (or series of photos if you are making a slide show). Transition effects are limited, although continuous looping is available. You can add a caption in a white box under each photo, but you have no control over the color or font. And you can add hyperlinks to

QUICK CLIPS

Homeworld 2

This real-time strategy game is more of a refinement of the original than a full-blown sequel. Graphically, the two are worlds apart, as Homeworld 2 is sublimely gorgeous. Although the single-player storyline is not very powerful, replayability is salvaged by an intense multiplayer mode. This is a solid release.—Ari Vernon

\$44.99 list. Sierra Entertainment Inc., <http://homeworld2.sierra.com>. ●●●●●



Wildlife Park

In Wildlife Park, kids 12 and older can build a park from 20 different open habitats, ranging from sea to tundra. Populate your park with furred, finned, or hooved beasts from about 45 species. As in similar games, the goal is to keep animals and employees happy and healthy—and keep the public coming through the gate.

Wildlife Park makes a nice addition to a sim collection.

—Carol Ellison

\$29.99 list. Encore Inc., www.encoreusa.com. ●●●●●



Max Payne 2: The Fall of Max Payne

The bullet-riddled, hyper-noir fun is as engrossing as ever in this sequel to the original third-person shooter. Ingenious level design is the game's hallmark: You'll be diving, dodging, and shooting with even more intensity than in the first game. Too much emphasis on the slow-motion feature drags the rhythm a bit, and the game seems awfully short. Still, 10 hours with a game this satisfying is time well spent.—Rich Brown

\$50 street. Rockstar Games, www.rockstargames.com. ●●●●●

GEAR & GAMES

Lots in Storage

Most types of gadgets are getting smaller, but the **Digitalway MPIO HS 100** portable memory device bucks the trend. Slightly larger than an old-fashioned cigarette lighter, it packs a whopping 1.5GB of storage space. That's because inside is a 1-inch Cornice Storage Element. Even though it's larger and heavier than a flash memory USB device (1.7 by 3.3 by 0.6 inches, HWD; 2 ounces), the MPIO is still very portable, and we were able to transfer 128MB of MP3 files onto it in just 41 seconds.—*Richard Fisco*

\$199.99 list. Digitalway, www.mpio.com. ●●●●●



Digital House Music

Imagine being able to play all your MP3 and WMA files on any speaker system in the house. You won't need to imagine this with the pioneering **Creative Sound Blaster Wireless Music**. It's a tiny stereo receiver that plugs into any speaker system with analog or optical inputs and plays music transmitted from a PC attached to your 802.11b or 802.11g network.

Other products offer similar capabilities, but none match the Wireless Music's powerful RF remote. Its oversize LCD and intuitive interface let you organize your music library, choose songs, and even generate playlists as though you were using a handheld MP3 player.—*Don Labriola*

\$250 street. Creative Labs Inc., www.creative.com. ●●●●●

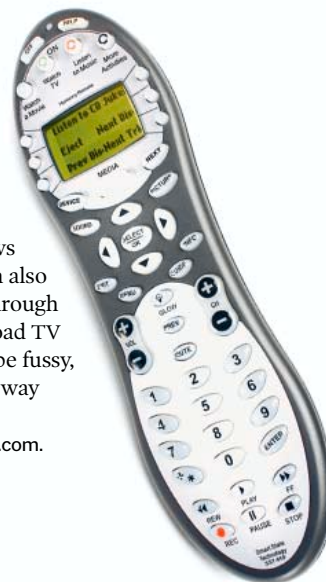


Near-Perfect Harmony

Finally, a universal remote that programs itself. Plug the **Intrigue Harmony SST-659** into your PC's USB port and specify which TV, DVD player, and AV receiver you're using and the remote programs all the keys. It even creates simple macros, such as

Watch a Movie, which turn on and tune in your devices automatically. Want to play DVDs from a Sony PlayStation 2 on a Panasonic LCD TV? The Harmony knows how. The database of preprogrammed electronics devices is enormous (and it can also learn from other remotes), a Help key steps you through minor programming mishaps, and you can download TV listings. Two minor downsides are that setup can be fussy, and the six-line LCD is small. Still, the Harmony is way ahead of any other \$200 remote.—*Bill Howard*

\$199 direct. Intrigue Technologies, www.harmonyremote.com. ●●●●●



Blue Streak

The **Sony Ericsson CAR-100** is a zippy little toy sports car you can control with any Sony Ericsson Bluetooth phone. (You can also control it with other phones, but you need a Sony Ericsson phone to charge the car.) Sure, it costs a bundle, but it's a classic geek indulgence. The car turns on a dime and speeds over wood floors and carpeting with ease. We needed considerable skill to dodge the giant, predatory cats chasing our car, but then we realized that's the best game you can play.—*Sascha Segan*

\$99 list. Sony Ericsson Mobile Communications AB, www.sonyericsson.com. ●●●●●



BACKSPACE

OLIVES, BOMBS, AND DOWN COMFORTERS.... WHAT AN INTERESTING WORLD!

Edited by Don Willmott



▲ Backspace on the Road: Tifton, Georgia, a city with at least two things going for it.

▼ It's either a very small horse or a very big house.
(HotPOP site)

Which of the following pets do you have in your home?

- | | |
|--|---------------------------------|
| <input type="checkbox"/> Reptiles/Snakes | <input type="checkbox"/> Dogs |
| <input type="checkbox"/> Fish | <input type="checkbox"/> Birds |
| <input type="checkbox"/> Horse | <input type="checkbox"/> Rabbit |

► Just how many olives comprise a year's supply?
(Unidentified spam)



Kensington® Wireless PocketMouse™ Pro With Retractable Cord

Now optical technology goes wherever you do. This mobile optical mouse has a retractable cord that stores inside it, so you can use it wherever you want. Optical technology offers precise tracking — no cleaning required. Small size fits neatly into notebook

▲ Ah, yes, that pesky wireless cord makes yet another appearance.
(Office Depot online)

U.S. Planes Drop Bombs Inside Pakistan

Fri Sep 19, 10:14 AM ET

By AHSANULLAH WAZIR, Associated Press Writer

WANA, Pakistan - U.S. warplanes taking part in the anti-terrorism campaign in Afghanistan ([news](#) - [web sites](#)) dropped three bombs that landed about 50 yards inside Pakistani territory on an empty field, residents and Pakistani intelligence officials said Friday.

ADVERTISEMENT



▲ Noisy bombs!
(Yahoo! News)

▼ Sure, we'd love a new comforter, but we're not sure why we'd shop for one at this particular store. (Yahoo! Shopping)



Pacific Coast 5 Diamond Klamath Down... 
by Pacific Coast 5 Diamond Klamath Down Comforter, Queen - prostatestories.com
Product Guide Pacific Coast 5 Diamond...
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expensive.**

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Notebook Essentials – Budget Friendly – Starting at 72 lbs.**

- Intel® Pentium® 4 Processor at 2.40GHz*
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- Integrated Intel® Extreme Graphics
- 65Whr Li-Ion Battery (8-Cell)
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- Productivity Pack including WordPerfect® and Money®
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for qualified customers
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The Inspiron 1100 notebook. It's hard to take your eyes off this stylish little number. And its beauty isn't only skin deep. Inside you'll find an Intel® Pentium® 4 processor clocking speeds up to 2.40GHz! That kind of performance never goes out of style. But its most stunning feature? Check out the price. And, of course, it's backed by Dell's award-winning service and support. Order one today and soon you'll be creating quite a stir.

Dell recommends Microsoft® Windows® XP Professional for Business

Best Budget Notebook

Inspiron 1100

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Options. Options. Options.



Dell recommends Microsoft® Windows® XP Professional for Business



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- 32MB DDR ATI's MOBILITY™ RADEON® 7500 AGP 4X Graphics
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MOBILE TECHNOLOGY



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