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MICHAEL J. MILLER

Forward Thinking

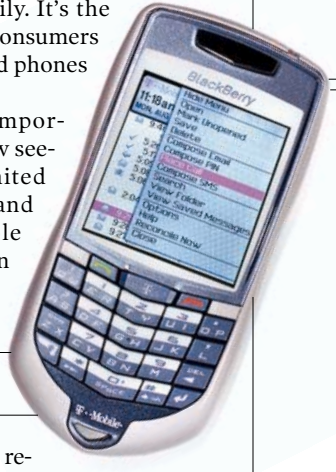
The next step will be CPUs with multiple processor cores on a single chip, something AMD and Intel have been talking about for years.

E-Mail Wherever You Go

If you live on e-mail, like me, you want to get your mail wherever you go. To help you do just that, we review the latest smart phones in our cover story, starting on page 92.

I've been a fan of the palmOne Treo 600 because I need a keyboard. But such devices, along with their wireless services, have been priced too high for consumers. So I'm glad to see a couple of new phones that handle e-mail with aplomb and are affordable for consumers. One such phone is the T-Mobile Sidekick II, also known as the Danger Hiptop. It flips open to bring up a keyboard and offers POP3 e-mail, Web access, and even AOL Instant Messenger and a camera. It has a nice color screen and a simple user interface, although it is bulky for a phone.

Another impressive mobile phone is the BlackBerry 7100t, also from T-Mobile, which is shaped like a conventional mobile phone. Its keyboard has multiple letters on each key, and it uses intelligent lookup to help you find the right words. I found it fairly easy to use. This BlackBerry appeals to people who are phone-centric but want to receive and send mail easily. It's the best solution I've seen for consumers and is part of a trend toward phones with keyboards.



But perhaps the most important trend is that we are now seeing deals that offer unlimited e-mail, Web browsing, and messaging for a reasonable price. That's a major step in making wireless e-mail a reality for everyone.

A New Game Plan for Longhorn

Microsoft recently announced big changes in its plans for the Longhorn release of Windows (see Pipeline on page 25). It's now set to ship in the second half of 2006 instead of 2007 but will be missing a key component: the new WinFS file system. Around the same time, the Avalon graphics subsystem and Indigo communications system will be available for Windows XP and Windows Server 2003. This news could have significant implications over the next few years. First, it means that a new Windows OS will be available in 2006. And, by making Avalon and Indigo available for XP, developers can get moving on those technologies in 2006 rather than waiting for Longhorn to reach a large installed base. In many respects, this approach is similar to what Microsoft did with the .NET Framework: we're already seeing some applications, such as ACT! 2005, using .NET well before Longhorn ships. But it also may mean that fewer people will need Longhorn, even with the promise of an improved interface and better search tools.

WinFS poses real compatibility challenges for developers. Microsoft has been working on an integrated data store for a very long time. It was supposed to ship in the mid-nineties but is taking much longer than expected.

Two Cores Are Better Than One

For years Intel and AMD have been battling to increase processor clock speed and performance. But along with increased megahertz comes increased heat. The next step will be CPUs with multiple processor cores on a single chip, something both AMD and Intel have been talking about for years.

AMD recently scored a coup, being the first to demonstrate a dual-core chip publicly, with a server running dual-core Opteron chips. Its server and workstation chips should be out by mid-2005, and Intel should be right behind, offering dual-core Pentium and Xeon chips sometime next year.

Forward Thinking

MICHAEL J. MILLER

HP's Carly Fiorina Talks Tech

Recently, I had the chance to speak with Hewlett-Packard CEO Carly Fiorina at the company's recent introduction of several new products. The full interview is available on our Web site at *www.pcmag.com/interviews*. Here are some excerpts.

MM: *You're introducing all sorts of new products, from cameras and printers to music players and televisions. What differentiates HP from competitors in the consumer electronics market?*

CF: This isn't about simply standalone products. It's about digital experiences that are fun, that are easy, that are affordable. The intellectual property that we can bring to this field ranges all the way from imaging science to what it takes to store, manage, and retrieve digitally based information.

"Every process, whether it's content creation, distribution , or enjoyment, is going to be digital, mobile, virtual, personal."

MM: *There's been a lot of talk about convergence. What is HP's vision?*

CF: We have entered an age now where every process and all content will become digital, mobile, virtual, personal. That means any kind of analog content you can imagine will become digital. Every process, whether it's content creation, content distribution, or content enjoyment that goes on in a home, is going to be digital, mobile, virtual, personal.

MM: *I've heard you talk a number of times about the importance of invention. Which of the recent product introductions really show off HP's unique inventions?*

CF: The first one I'd pick is the home theater; it's an example of why only HP can do this. It's an example of taking imaging technology and computing technology and engineering experiences, not just products. The second example I'll pick is the DJammer prototype from HP Labs. The DJammer is a wireless device that will mix digital and analog music. You can get scratching effects, tempo changes, and pitch changes, all by literally moving a device. It's not a product yet, but it gives you a sense of what's possible.

MM: *How is invention a core part of HP?*

CF: One of the things that we've really tried to emphasize in the past several years is the importance of innovation and invention, and we are proud of the fact that we are now one of the top ten innovators in the world. We weren't five years ago. We're proud of the fact that we are generating 11 patents a day. Five years ago we didn't count. And two years ago, it was only 3 a day. But we do focus our innovation. The way we describe it internally is we talk about focusing our innovation in areas where we can make a unique contribution and lead. And we partner for the rest.

MM: *Does HP have any interest in Linux as a desktop operating system?*

CF: I think eventually, yes. We have a couple of pilots in the developing world around Linux on the desktop. We're doing some work around Linux in China. And we have a pilot program called 441 in South Africa. It's called 441 because four users are leveraging the capabilities of one system. It is Linux-based and therefore much more affordable in the context of a developing world. I think it will take a long time, and I think that, of course, Windows will continue to innovate.

MM: *Satisfaction with technical support among our readers is significantly down in the past year, and I hear complaints about offshoring. Is there something that HP can do differently to improve its technical support?*

CF: I think a lot of the frustration is because technology isn't in the back office anymore. It's not just for the geeks; it's for everybody. Of course, outsourcing is in and of itself a difficult and emotional topic. And, as has been the case with some of our competitors, some people's outsourcing experiences have been poor. Obviously, the quality of our tech support is an area of great focus and great concern. And in a digital, mobile, virtual, personal world, more and more tech support can be provided virtually—not all of it, but a lot of it.

One of the innovations we have delivered for small and medium business is online tech support. It basically allows a small and medium business owner who doesn't have access to a bunch of folks to use expert systems in a digital environment to get support. I think we can bring technology and innovation to tech support just as we bring technology and innovation to managed services. For us, it's not just a people business; it's a technology business.

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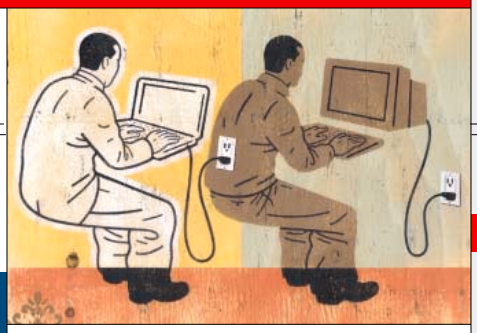

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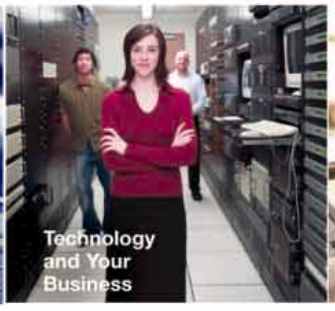

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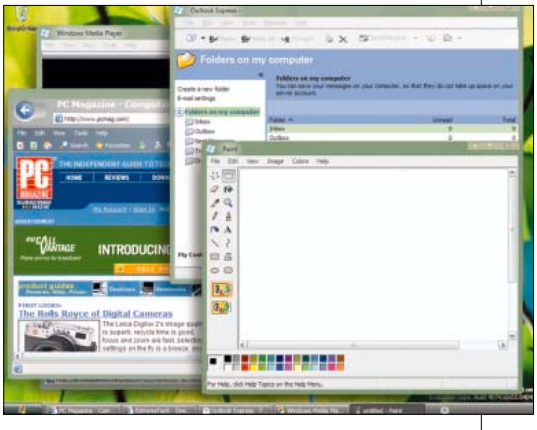
PIPELINE

TECHNOLOGY TRENDS & NEWS ANALYSIS

Shift in Windows' Road Map

Microsoft's Longhorn OS will ship earlier than expected—minus a core piece.

BIG CHANGES ARE AFOOT for the next version of Microsoft Windows, code-named Longhorn. Microsoft confirmed in late July that it is now targeting late 2006 as a shipping date. The company had previously targeted 2007. In addition, Microsoft announced that WinFS, the much-awaited new file system and storage subsystem slated to be in Longhorn, won't arrive until after the release of the operating system.



A beta version of WinFS will be available when Longhorn ships, but releasing the operating system without it is a major decision. The company is marketing WinFS as a tool for getting applications to work together better, helping people organize data more efficiently, and enabling applications to take advantage of greater storage capacity.

WinFS combines the existing file system (NTFS) with a database subsystem slated as the next version of Microsoft SQL Server (Yukon). One major expected benefit of WinFS will be the ability to take files and associate them with metadata to enhance how files and applications work together.

"While we're not shipping the full WinFS component in Longhorn that would allow for a programmatically exposed relational store," says Greg Sullivan, lead Windows product manager, "we will build in intuitive, full-text system search—along the lines of what you see in a product such as X1."

Sullivan says that WinFS may ship as a Windows Service Pack or as a downloadable component. The announcement comes on the heels of months of rumors that WinFS would be scrapped altogether.

It's good news that after years of waiting, a major update to Windows will arrive earlier than expected. But it's now confirmed that it will arrive in two parts.—*Sebastian Rupley*

Living Color

Sony has some new televisions with truly unique color attributes. The company has announced two Qualia LCD TVs that use LEDs (light-emitting diodes) for their backlights instead of the traditional cold-cathode fluorescent lamps (CCFLs) used in LCD monitors and TVs.

The new backlight design promises much more colorful displays. Solid-state LEDs produce a range of light that more closely matches the color filters used on LCD panels, resulting in a larger color gamut. Because they match sRGB standards, displayed images resemble printed output more closely. The LED-based *TV*s are also easier on the environment, because LEDs, unlike CCFLs, don't use mercury.

Lumileds makes the LEDs. Stay tuned.—*Alfred Poor*

JETCAR Bose has developed an electronic vehicle-suspension system, powered by a 750-MHz Pentium III chip. In a demo, a car moving at 30 miles per hour flew—literally flew—over a six-inch-high obstacle. See "Bose Reimagines Auto Suspension" at *www.pcmag.com*.

On Newsstands in Space

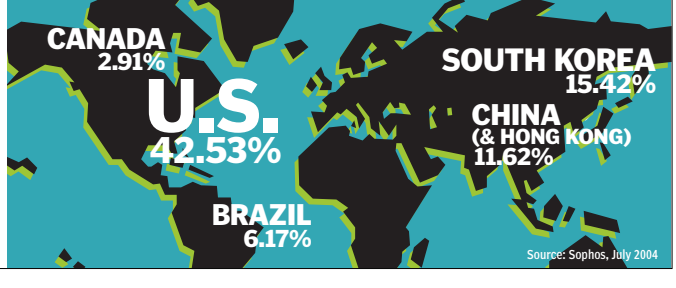
PC MAGAZINE is hitting new heights—literally. Zinio Systems, which produces digital versions of popular magazines, has announced that the astronauts living onboard the International Space Station are receiving *PC Magazine* in digital form to read on their notebook computers. "The sky's the limit when it comes to reading digital magazines," quipped Scott Kauffman, Zinio's CEO. Flight engineer Mike Fincke is one reader. And he doesn't have to worry about littering those annoying little subscription cards all around the space station, either.—*SR*

ILLUSTRATION BY RICH LILLASH

Who Is Sending All That Spam?

The United States qualifies as the leading spam-producing country in the world, responsible for nearly half of junk-mail messages. South Korea—the most broadband-connected country—has also become one of the top producers.

Top 5 Spam-Producing Countries (percent of total spam)



Source: Sophos, July 2004

Software Switcheroo

Businesses making significant hardware upgrades often encounter headaches when they port their existing applications to a new platform. But if one company has its way, software redeployment may change dramatically.

Transitive Corp.'s QuickTransit hardware virtualization software is designed to let any app compiled for one processor and OS run on another processor and OS, with no source code or binary changes.

If the system works, a business could take older apps written to run on Alpha

workstations and transfer them to newer Itanium systems without having to waste IT resources porting programs over. "We think we can bring any application, from CAD/CAM to mail servers" across from one platform to another, says Bob Wiederhold, Transitive's CEO. He concedes that computationally intensive programs may take a performance hit.

Initially, QuickTransit will work only for a few platforms, including MIPS, x86, and PowerPC systems, and only with Linux- or Unix-based operating systems. So versions of the software will support Apple's OS X, but Windows users will have to face upgrade headaches on their own.—*John R. Quain*

HP Eyes Entertainment

HEWLETT-PACKARD is up to some new tricks. At a Miami event in late August, CEO Carly Fiorina announced a variety of new products, including printers, cameras, TVs, and HP's own version of the Apple iPod. Fiorina discussed how the announcements support her vision of a world that is "digital, mobile, virtual, and personal."

HP's version of the iPod, shipping in September, looks just like Apple's, except for the HP logo beneath the Apple logo on the back of the device. The biggest difference is probably HP's ability to add Tattoos, removable skins that wrap around the iPod (see the photo). HP will offer the printable tattoos as a package with special printing media for all iPods. You'll be able to download specially designed pictures of particular artists, or print your own pictures to personalize the device.

Fiorina said she expects the holiday season to be big for digital entertainment, with particular focus on the ever-growing digital music market. She anticipates a $360 billion market for digital entertainment products by 2007. For more details on this, and on the company's entry into the television market with a suite of new plasma and LCD flat-panel sets, see "An HP iPod and More" at *www.pcmag.com.—Michael J. Miller*

SERIOUS MUSCLE Orion Multisystems, a Silicon Valley startup, is putting clustered computing, typical of giant data centers, into single boxes. The firm has a 12-node desktop workstation designed to offer up to 36 gigaflops of performance, and a 96-node workstation that reportedly peaks at 300 gigaflops.

The 96-node workstation houses up to 192GB of memory and 9.6TB of storage. Systems can carry price tags of up to $100,000, but that's far cheaper than the supercomputers they compete with, which often cost from $500,000 to above seven figures.

Microsoft at the Mic

IN AN INCREASINGLY competitive digital-music arena, Microsoft has entered the fray with the prerelease version of its MSN Music service. Over 500,000 songs are available at *http://beta.music.msn.com.* Final release is slated for mid-October.

The basic policies for the MSN Music service are similar to those of its competitors' offerings, such as Apple's market-leading iTunes music store. Songs cost 99 cents and albums $9.99. Microsoft has over one million tracks licensed, plus agreements with 3,000 independent labels. Songs purchased through the service can play on over 70 Windows Media–compatible music players, including new Portable Media Centers.

Microsoft cites existing MSN services and online traffic as advantages to its service. "We have over 350 million people who come to MSN.com each month," says Christine Andrews, a lead product manager. "We're also integrating MSN Music with existing assets, such as MSN Messenger, search tools, and other applications."

In addition to Web access, MSN Music is available from Windows Media Player 10 (shown here), automatically loading songs into the media library.

With over 70 percent market share, Apple still rules music downloads. Sounds like entertainment is the new battlefield for the longtime rivals.—*SR*

NET BETS Online gambling is now big business, and who's doing it may surprise you. Global revenues for 2003 were over $6 billion, says Christiansen Capital Advisers, LLC. CasinoFortune.com, a leading site, also reports that over half of its gamblers are women.

ILLUSTRATION BY RICH LILLASH

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EX-Z30
3.2 MEGAPIXELS

EX-P600
6.0 MEGAPIXELS

*2.5 times the battery life of current CASIO cameras (comparison between EX-Z4U and EX-Z40)
*CIPA standard for battery life indicates 360 photos on a single charge. Image on camera LCD simulated

CASIO

COMING ATTRACTIONS

Apple Tops Itself—Again

Apple bills its beautiful **Apple iMac G5** as "the world's thinnest desktop computer"—the entire PC is 2 inches deep. The entry-level model, with a 17-inch LCD screen and 1.6-GHz PowerPC G5 processor, comes with a 533-MHz front-side bus. The mid-level system jumps to 1.8 GHz with a 600-MHz front-side bus and includes a SuperDrive DVD-RW burner. Both have an 80GB Serial ATA hard drive. The top iMac has a 20-inch LCD and 160GB hard drive. All models include Bluetooth and 802.11g.

$1,299 to $1,899 direct. Apple Computer Inc., www.apple.com/imac.

Record Direct to DVD

The **Sony DCR-DVD301 DVD Handycam** will record directly to 3-inch DVD-R/-RW discs, which play in most current home and PC DVD players. The 3.5-inch SwivelScreen LCD minimizes display washout even in bright sunlight and can rotate up to 270 degrees for multiple viewing angles. The camcorder also features the ability to take 1-megapixel digital still images.

$1,100 direct. Sony Electronics Inc., www.sonystyle.com.

Lightweight, High-Output Projectors

The **Epson PowerLite 740c** and the wireless-enabled **745c** are the first 2,500 ANSI lumens projectors with XGA resolution to weigh less than 4 pounds. The 745c's 802.11g uploads presentations at blazing speeds, and both can project photos in slide shows directly from digital cameras or via USB memory or external hard drives.

$2,900 street. Epson America Inc., www.epson.com.

Find Your Way Home

The **Suunto X9** is the smallest GPS unit on the market, and it comes equipped with thermometer, date/time, compass, altimeter, and barometer. The Track Back function retraces your steps; program a starting point and it directs you back to your "Home." With access to Suuntosports.com's online community, it's a must-have for adventure enthusiasts.

$769 list. Suunto USA, www.suuntousa.com.

Portable Video Player

The Archos Gmini400 portable media player is a lightweight, ultra-slim device that can hold up to 300 hours of music, 200,000 digital photos, or 80 hours of MPEG-4 video. Built around a 2.2-inch color LCD screen, the unit features a built-in CompactFlash reader for transferring photos and data and even a selection of games.

$399.95 list. Archos, www.archos.com.

Take a Memo

The NexConcepts Mobile NoteTaker is a wireless, pocket-size device that digitally captures up to 50 pages of handwritten notes. Just clip the device to any sheet of paper (up to 8.5 by 11 inches), and start writing with the digital pen (which can also be used as a traditional pen). Notes and illustrations can be uploaded to a PC via a USB connection.

$149 list. NexConcepts, www.nexconcepts.com.

For more new products see **www.pcmag.com/productbulletin.**

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EDITORS' CHOICES

OCTOBER 5–OCTOBER 19, 2004

In the market to buy? Here are our latest Editors' Choices in the leading technology categories—the products we've picked as the best from the hundreds that PC Magazine Labs has been testing. For links to the complete reviews, including dates of publication, visit www.pcmag.com/editorschoice.

DESKTOP PCs & SERVERS

GAMING DESKTOPS
- Falcon Northwest FragBox Pro
- Falcon Northwest Mach V
- Velocity Micro Vision FX

MULTIMEDIA DESKTOPS
- Apple Power Mac G5 Dual 2 GHz
- Dell Dimension 8400

MEDIA CENTER PC
- HP Media Center PC m1050y

VALUE PC
- eMachines T3092

SMALL-BUSINESS PC
- IBM ThinkCentre A50p

CORPORATE PC
- IBM ThinkCentre S50

ENTRY-LEVEL SERVER
- IBM eServer xSeries 306

ENTERPRISE SERVER
- Dell PowerEdge 2850

PORTABLE PCs

BUSINESS NOTEBOOKS
- Acer Travelmate 8000
- HP Compaq nc6000

ULTRAPORTABLE NOTEBOOK
- IBM ThinkPad X40

MULTIMEDIA NOTEBOOKS
- HP Pavilion dv1000
- NEW Toshiba Qosmio E15

GAMING NOTEBOOK
- Dell Inspiron XPS

VALUE NOTEBOOKS
- Apple iBook
- Averatec AV3225HS
- HP Compaq Presario R3000Z

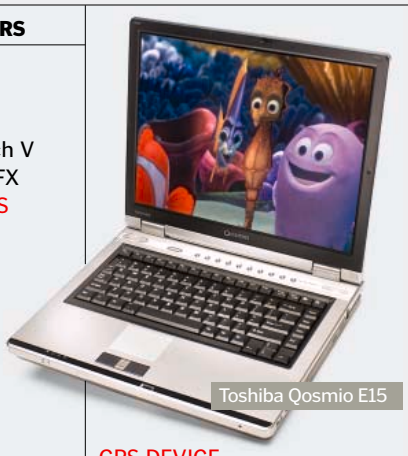
TABLET PCs
- Motion Computing M1400
- Toshiba Portégé M205-S809

MOBILE DEVICES

PDAs
- HP iPAQ Pocket PC h4350
- palmOne Zire 72

PHONE/E-MAIL DEVICE
- BlackBerry 7100t

PHONE
- NEW Nokia 6620



Toshiba Qosmio E15

GPS DEVICE
- TomTom Bluetooth GPS Receiver

HOME ENTERTAINMENT

MEDIA HUBS
- Creative Sound Blaster Wireless (music)
- Prismiq MediaPlayer
- Turtle Beach AudioTron AT-100 (music)

DIGITAL VIDEO RECORDER
- SnapStream Beyond TV 3

HDTVs
- NEC PlasmaSync 61XM2+/S
- Sharp Aquos 37-inch LCD TV

CAMERAS

ULTRACOMPACT
- Sony Cyber-shot DSC-T1

COMPACT
- Canon PowerShot S60
- Casio Exilim Pro EX-P600
- Kodak EasyShare LS743

SUPERZOOM
- Olympus Camedia C-765 Ultra Zoom

ENTHUSIAST
- Konica Minolta DiMage A2
- Leica Digilux 2
- Olympus C-5060 Wide Zoom
- Olympus C-8080 Wide Zoom

DIGITAL SLR
- Nikon D70

ENTRY-LEVEL DV CAMERA
- Sony DCR-HC40 MiniDV Handycam

DIGITAL IMAGING

FLATBED SCANNER
- Microtek ScanMaker 6100 Pro

IMAGE EDITORS
- Adobe Photoshop CS (pro)
- Adobe Photoshop Elements 2.0 (consumer)

PHOTO ALBUM SOFTWARE
- Adobe Photoshop Album 2.0

PHOTO SHARING
- OurPictures
- smugmug

PHOTO-PRINTING SERVICE
- Shutterfly

DIGITAL AUDIO & VIDEO

VIDEO EDITORS
- Adobe Video Collection 2.5
- Ulead VideoStudio 8 (consumer)

CD/DVD-BURNING SUITE
- Roxio Easy Media Creator 7

DVD AUTHORING
- Sonic MyDVD 5.2 (consumer)
- Ulead DVD WorkShop 2 (pro)

SLIDE SHOW CREATOR
- Arcsoft DVD SlideShow

PORTABLE AUDIO
- Altec Lansing inMotion
- Apple iPod
- Apple iPod Mini
- Belkin Digital Camera Link
- Delphi XM Roady2
- iRiver H140
- Samsung Yepp YP-T5

SOUND CARD
- Creative Sound Blaster Audigy 2 ZS

SPEAKERS
- Creative Gigaworks S750
- Klipsch ProMedia GMX D-5.1

PC MEDIA PLAYER
- Microsoft Windows Media Player 10

MUSIC STORE
- Napster 2.0

WEBCAM
- Logitech QuickCam Pro

MOUSE
- Logitech MX1000 Laser

Nokia 6620

PRINTERS

PERSONAL PRINTERS
- Brother HL-5140 (laser)
- HP Deskjet 5150 (ink jet)
- Lexmark C510n (color laser)

PERSONAL AIOs
- Brother MFC-3420 (ink jet)
- Brother MFC-8420 (laser)
- Canon MultiPass MP390 (ink jet)

PHOTO PRINTERS
- Canon i9900 Photo Printer
- Epson Stylus Pro 4000
- HP Photosmart 7960

NETWORK PRINTERS
- HP Color LaserJet 4650n
- HP LaserJet 9000dn
- Xerox Phaser 4500DT
- Xerox Phaser 7750DN

DISPLAYS & STORAGE

BUSINESS DISPLAYS
- Envision EN7220
- IBM ThinkVision C220p
- NEC MultiSync LCD1960NXi

BUSINESS PROJECTOR
- Sony VPL-CX85

GAMING GRAPHICS CARD
- ATI Radeon 9800 XT

MAINSTREAM GRAPHICS CARD
- PNY Verto GeForce 5700 FX Ultra

DVD BURNERS
- BenQ DW830A 8X DL
- HP DVD Movie Writer dc4000
- Memorex True 8X External Dual Format Recorder
- Pioneer DVR-A07XL

EXTERNAL DRIVES
- Transcend 1.8" Portable Hard Drive
- Western Digital Media Center
- WiebeTECH Fire800

REMOVABLE STORAGE
- Iomega Rev 35

EDITORS' CHOICES

OCTOBER 5–OCTOBER 19, 2004

NETWORKABLE STORAGE
- Buffalo LinkStation Network Storage Center

PORTABLE PHOTO STORAGE
- Micro Solutions RoadStor

PRODUCTIVITY SOFTWARE

OFFICE SUITE
- Microsoft Office 2003

OCR
- ScanSoft OmniPage Pro 14 Office

PDF CREATION
- Adobe Acrobat 6.0
- FinePrint pdfFactory PRO 1.57
- Jaws PDF Creator 3.0

DOCUMENT MANAGEMENT
- ScanSoft PaperPort Pro 9 Office

DESKTOP PUBLISHING
- Adobe InDesign CS

FINANCE & ACCOUNTING
- Microsoft Money Premium 2005
- QuickBooks Premier 2004

WEB SITE CREATION
- NeoVerve StoreSense

WEB RESEARCH
- NEW Amplify
- NEW enLighter Retriever
- Onfolio Professional

MEDIA CREATION SUITE
- Roxio Easy Media Creator 7

E-MAIL CLIENT
- Microsoft Outlook 2003

VIDEOCONFERENCING
- SightSpeed Video Messenger
- VidiTel

WEB COLLABORATION
- NEW Intranets.com

DATABASE
- FileMaker Pro 7

D-Link DCS-5300G 802.11g Internet Camera

BLOG/WIKI TOOLS
- EditMe
- Socialtext Workplace 1.0
- TypePad

UTILITIES

ANTIVIRUS
- Norton AntiVirus 2004

FIREWALLS
- Norton Personal Firewall 2004
- ZoneAlarm Pro 5

SECURITY SUITES
- Norton Internet Security 2004
- ZoneAlarm Security Suite 5

ANTISPYWARE
- NEW Ad-Aware SE Plus 1.0.2
- SpySweeper 3.0

ANTISPAM
- Cloudmark SpamNet 2.5
- MailFrontier Desktop 4.0
- Qurb

POP-UP BLOCKER
- PopUp Cop

INSTANT MESSAGING
- MSN Messenger 6.1

FILTERING/MONITORING
- Cybersitter 9.0
- Spector Pro 5.0
- The Children's Internet

FILE COMPRESSION
- PKZip 8.0 for Windows
- StuffIt Deluxe 8.0

BACKUP
- IBackup
- Retrospect Pro 6.5

ROLLBACK
- Norton GoBack 3.0

DISK IMAGING
- NEW Symantec Ghost 9.0

PARTITIONING
- PartitionMagic 8.01

DEFRAGGERS
- Diskeeper 8.0 Pro
- PerfectDisk 6.0

REMOTE ACCESS
- LapLink Everywhere 2.0

FILE MANAGER
- Novatix ExplorerPlus 6.1

MIGRATION
- Alohabob PC Relocator Ultra Control
- Desktop DNA Pro 4.7

TOOLBARS
- Dogpile
- Google Toolbar

DESKTOP CUSTOMIZATION
- Object Desktop 2004

DOWNLOAD MANAGER
- DownloadStudio 1.0

3Com Office Connect Wireless 54Mbps 11g Travel Router

SCREEN CAPTURE
- SnagIt 7.0.3

FILE VIEWER
- IrfanView 3.85

VIRTUAL PC
- VMware Workstation 4.5

PASSWORD MANAGER
- AccountLogon 2.5

ENTERPRISE SOFTWARE & DEVELOPMENT

NETWORK ANTIVIRUS
- Trend Micro Enterprise Protection Strategy

ENTERPRISE ANTISPAM
- BrightMail Anti-Spam 5.1
- Postini Perimeter Manager

E-MAIL SERVER PLATFORM
- IBM Lotus Notes and Domino 6.5

WIRELESS PLATFORM
- GoodLink 3.0

WEB FILTERING
- Websense Enterprise 5.1

CRM
- salesforce.com Enterprise Edition

DATABASE
- Oracle 9*i* Database

WEB CONFERENCING
- WebEx Meeting Center

ENTERPRISE DEVELOPMENT
- Borland JBuilder 9
- IBM WebSphere Studio Device Developer 5.6 (mobile)
- SQL Anywhere Studio 9 (mobile)

WEB SITE DEVELOPMENT
- NEW Macromedia Contribute 3
- Macromedia Studio MX 2004

WEB SITE ANALYSIS
- WebSideStory HBX
- WebTrends 7 Enterprise

VULNERABILITY SCANNER
- Retina Network Security Scanner

NETWORKING

SERVER OS
- Microsoft Windows Server 2003 Enterprise Edition

WIRELESS INFRASTRUCTURE
- Cisco Aironet 1200
- NEW D-Link DCS-5300G 802.11g Internet Camera
- Hawking HWPS12UG (print server)
- Linksys Wireless-G WRT54GS (802.11g)
- Netgear ProSafe-FWAG114 (802.11a/g)
- NEW 3Com Office Connect Wireless 54Mbps 11g Travel Router

SECURITY APPLIANCE
- ServGate EdgeForce

REMOTE-ACCESS APPLIANCE
- Neoteris Access 1000

GAMES & EDUCATIONAL SOFTWARE

SIMULATION
- Microsoft Flight Simulator 2004

ACTION/COMBAT
- Battlefield Vietnam
- Far Cry
- Halo: Combat Evolved
- Orbz 2
- Savage: The Battle for Newerth

SPORTS
- Madden NFL 2004

REAL-TIME STRATEGY
- Rise of Nations: Thrones and Patriots

VIRTUAL WORLD
- Second Life
- NEW The Sims 2

ONLINE GAME
- EverQuest: Evolution

EDUCATION
- eMedia Beginner Guitar Method 3.0
- Math Mission: The Race to Spectacle City Arcade, The Amazing Arcade Adventure
- Vtech V.Smile Learning System, Smartbridge Library
- Zoombinis Island Odyssey

MOBILE GAME
- Bejeweled

REFERENCE & HOBBIES
- Coin Collector's Assistant Plus
- Microsoft Encarta Reference Library 2005
- Visual Thesaurus

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Crystal Reports 10

Which edition of Crystal Reports® is right for you?

	Report Author/IT Editions		Bundled Developer Editions		Full Developer Editions	
	Standard	Professional	.NET Edition [2]	Java™ Edition [3]	Developer	Advanced
Report Creation						
Visual report designer for rapid data access and formatting	●	●	● [1]	● [1]	●	●
Customizable templates for faster, more consistent formatting	●	●			●	●
Repository for reuse of common report objects across multiple reports [4]		●			●	●
Data Access						
PC-based and Microsoft® ODBC/OLE DB for MS Access and SQL Server	●	●	●	●	●	●
Enterprise database servers (ODBC, native)		●	● [1]	● [1]	●	●
Custom, user-defined data through JavaBeans™				●	●	●
Custom, user-defined data through ADO and .NET			●		●	●
Report Integration						
Report viewing APIs (.NET and COM SDKs)			●		●	●
Report viewing APIs (Java SDK)				●	●	●
Extensive report viewer options (DHTML, ActiveX, Java Plug-in, and more)					●	●
APIs for run-time report creation and modification						●
Report Parts for embedding report objects in wireless and portal apps	●	●			●	●
Report Deployment						
Crystal Reports components for report viewing, printing, and exporting:						
a) Java reporting component				●	●	●
b) .NET reporting component			●		●	●
c) COM reporting component					●	●
Full featured report exporting		●			●	●
Report server (Crystal Enterprise Embedded deployment license)						●

1 Limited functionality. 2 Bundled with Microsoft® Visual Studio® .NET and Boland® C#Builder™.
3 Bundled with BEA WebLogic Workshop™ and Boland® JBuilder®. 4 This feature is available on the Crystal Enterprise CD, included in the Crystal Reports 10 package.

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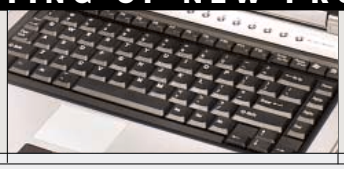
36 SMC SMCWTK-G Wireless Traveler's Kit
38 3Com OfficeConnect Wireless 54Mbps 11g Travel Router



38 Toshiba Qosmio E15
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Spot (and Stop) the Spies

THE MAGAZINE WORLD'S LARGEST COMPUTER-TESTING FACILITY

PC LABS

BY JOHN CLYMAN

Antispyware tools seem to be proliferating nearly as fast as spyware itself. Choice is usually a good thing—as long as you make the right one. So for this story we tested two antispyware utilities we hadn't encountered before, as well as a significantly revised version of Lavasoft's perennially popular Ad-Aware, which looks better than ever. • Our testing also gave us an opportunity to confirm that Windows XP Service Pack 2 indeed raises the bar for built-in defense against adware and spyware programs that attempt to infiltrate your system. For the best spyware protection, we recommend installing SP2 and actually heeding the warnings issued by Internet Explorer—and then backing up that defense with a dedicated antispyware tool like the new Ad-Aware SE Plus 1.0.2 (reviewed here) or our other Editors' Choice, Webroot's Spy Sweeper 3.0 (First Looks, September 7). Both of these tools are comparable in terms of what they block in real time, and both are far ahead of any others we've tested in this regard (though still not perfect). Likewise, their detection and removal performance is very good (though definitely imperfect).

Ad-Aware SE Plus 1.02

PC MAGAZINE EDITORS' CHOICE

Lavasoft's Ad-Aware SE series expands the capabilities of this long-established antispyware tool. With its more effective real-time blocking and even more granular configuration options, this is a product that power users are likely to flock to.

Ad-Aware's Ad-Watch real-time blocking did reasonably well in our testing. In contrast with the other tools reviewed here, whose notifications during downloads of suspect software were spotty at best, Ad-Aware popped up warnings about virtually every dangerous product we installed. In some cases, though, having Ad-Aware attempt to block the installation wasn't entirely effective; the installations proceeded partially and sometimes left the browser crash-prone afterwards. Despite this problem, few products we've seen have been as consistent about providing immediate feedback about potential threats.

Ad-Aware was also fairly effective at detecting and removing existing spyware. Unlike Spyware Doctor and SpySubtract, it managed to eliminate the bulk of the annoying pop-up ads appearing while we surfed on one test bed system, for example, but it did leave a few suspect objects running in our system tray.

On the interface side, we particularly like that Ad-Aware offers both a summary view and a detail view of the detected programs, along with useful threat-specific information. Right-clicking on a suspect program or trace brings up a large menu of options for selecting exactly what to quarantine, delete, or ignore, or to perform functions like jumping into a Registry editor to examine a spyware trace in detail.

Power users will delight in Ad-Aware's extensive array of configuration options, logs, and statistics. Ad-Watch even lets you build custom rules to ignore events tied to specific Registry keys and values.

Ad-Aware's prevention and removal weren't perfect, but we have yet to see an antispyware product that is. As a weapon against the ever-growing nuisance of spyware and adware, this version looks better than ever.

Ad-Aware SE Plus 1.02

$26.95 direct. Lavasoft, www.lavasoftusa.com.

●●●●○

AD-AWARE'S FINE real-time blocking and good malware detection and removal are made more useful by the program's thorough, informative reporting on the threats it finds.

SpySubtract 2.5

InterMute's SpySubtract provides a fair degree of antispyware capability, but not enough to make it a compelling alternative to competitors such as Ad-Aware and Spy Sweeper. Although it showed modest success in blocking, detecting,

PHOTOGRAPHY BY THOM O'CONNOR

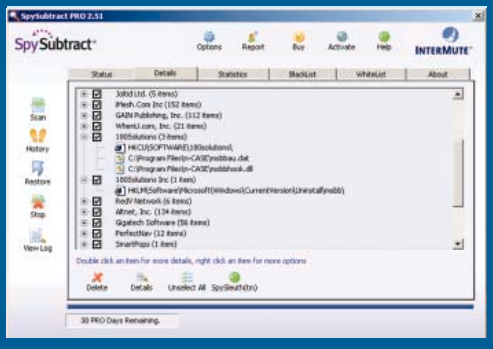
L O O K S

WHAT THE RATINGS MEAN: ●●●●● EXCELLENT | ●●●●○ VERY GOOD | ●●●○○ GOOD | ●●○○○ FAIR | ●○○○○ POOR

45 Basecamp
45 Groove Virtual Office, Professional Edition,Version 3.0
46 Intranets.com
48 Barca
48 Bloomba Personal 2.0.1
50 Qnext
52 Panasonic PV-GS120, VDR-M50
52 Kyocera Finecam SL400R
52 Nikon Coolpix 3200, Coolpix 4100

54 Canon PIXMA iP4000, Oki B6200n
54 Canon PIXMA iP1500, iP2000, iP3000
56 Macromedia Contribute 3
56 Zend Studio 3.5
RED denotes Editors' Choice.

and removing adware and spyware during our testing, the protection it provides is far from complete. Also, SpySubtract's lack of threat-specific details about the nature and severity of sus-pect programs (to help you make informed decisions) is disappointing.



SPYSUBTRACT'S UI is uncluttered and easy to use, though its performance was disappointing.

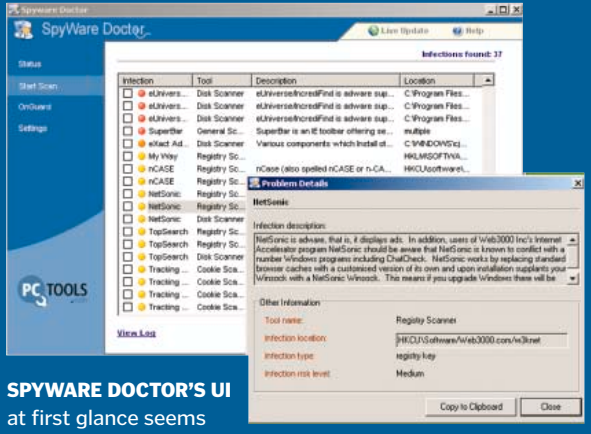
SpySubtract's colorfully named Venus Spy Trap—its real-time blocking component—had some success at identifying attempted adware and spyware installations as they occurred, catching some suspect processes and identifying attempts to hijack the browser home page. But it managed to do this for only about half the suspicious programs we tried installing, in contrast with Ad-Aware's Ad-Watch, which warned us about nearly all of them. SpySubtract's effectiveness in identifying and removing threats during full system scans was similarly mixed. While it did locate a number of infestations, it also missed many.

One unique component that SpySubtract does offer is SpySleuth. If you analyze a suspect file, SpySleuth will try to tell you what application it's associated with, the URL it was downloaded from, or other files that were installed around the same time—all of which could, in principle, provide clues as to how your system got infected. While this is an interesting idea, we didn't find it to be all that useful in practice. And we did miss the threat-specific descriptions provided by Ad-Aware and Spyware Doctor.

While we like SpySubtract's simplicity, its performance in the critical capabilities of spyware blocking, detection, and removal don't help it stand out in a crowded field.

SpySubtract 2.5

$29.95 direct. InterMute Inc., www.intermute.com. ●●◐○○



SPYWARE DOCTOR'S UI at first glance seems straightforward but becomes a tedious, mazelike experience when you need to configure advanced settings.

Spyware Doctor

Given the other strong antispyware options on the market today, PC Tools' Spyware Doctor left us underwhelmed. Its OnGuard real-time blocking capability did little to prevent infestation in our testing. Spyware Doctor's best feature is the detailed and informative descriptions it provides for the malware it detects, but that bright spot isn't enough for us to recommend it over a well-rounded and more effective product like Ad-Aware SE or Webroot's Spy Sweeper.

After completing a scan, Spyware Doctor displays a dialog box to warn you about running processes that it considers risky and recommends that you terminate them—an all-or-nothing decision, as there's no mechanism for selecting individual processes. Oddly, we found that Spyware Doctor sometimes identified *itself* as a pest, and that electing to terminate it would close the application.

Spyware Doctor then organizes other traces it finds in a cramped listview. Unlike Ad-Aware and SpySubtract, it provides no easy way to select all the traces associated with a single malware component. Seeing enough of the description to make an informed decision requires double-clicking on a list item. The payoff is that the data you get from doing so is quite informative.

Spyware Doctor identified and successfully removed a number of adware and spyware threats. It even managed to remove the browser toolbars that many other antispyware products leave behind. But it missed enough that we were still confronted by a constant stream of pop-up ads while we surfed.

Spyware Doctor offers a wide variety of real-time blocking options, but configuring them requires navigating a variety of confusingly arranged panes. Real-time scanning also placed significant demands on the system: When we tried setting its detection interval to the shortest possible value (5 seconds), it began consuming almost all of our CPU cycles and slowed the machine to a crawl. And in the end, turning on all the real-time blocking capabilities had little apparent effect on our test machine's susceptibility to infestations.

Spyware Doctor

$39.95 direct. PC Tools, www.pctools.com/spyware-doctor. ●●○○○

The Traveler's New Best Friend?

BY CRAIG ELLISON

Techie road warriors tend to travel with lots of gadgets, but one item has eluded their carry-on size requirements: the wireless router. Previously, going untethered in a broadband-enabled hotel room or sharing the connection meant lugging along a full-size router. Not anymore. Netgear, SMC, and 3Com are each selling 802.11g-based wireless travel devices that, at about the size of a deck of cards, are designed specifically for the mobile professional.

The products from Netgear and 3Com are nearly identical in size, though they differ a bit in features. Both can be configured as either a router (for sharing a broadband connection) or as a simple access point. Both contain an SPI (Stateful Packet Inspection) firewall, MAC access control, a list of attached stations, and VPN (IPsec and PPTP) pass-through—a must for corporate travelers. The SMC product is a somewhat different beast and can act only as an access point or bridge, with no routing capabilities.

For security, all three support WEP encryption and SSID broadcast suppression, so you remain invisible to strangers seeking an AP. The SMC and 3Com devices support WPA.

Being forward-thinking early adopters, we'd like to see a wired Ethernet port built into the devices. Without one, those traveling with VoIP (Voice over IP) telephone adapters are out of luck. For the vast majority of road warriors, though, one of these devices will be a welcome addition to your travel arsenal.

NETGEAR WGR101

Netgear was first out of the gate with the Netgear WGR101 802.11g travel router, which has the basic features to satisfy most road warriors. Like 3Com's entry, the WGR101 has a switch with four positions. But unlike its competitor, it uses only the first three positions for now. Missing in the Netgear device is an Ethernet client mode—a minor omission, since you're unlikely to be bridging an Xbox (or the like) to an existing wireless network in your hotel room.

In switch position 1, the WGR101 acts as a single-client access point, whereas the 3Com product can support multiple clients. But limiting use to a single client can be beneficial on the road, since it prevents others in adjacent rooms from connecting to the hotel's network through your AP. (Multiple connections might result in an additional Internet usage charge.)

If you need to use the WGR101 as an AP for multiple systems, you can set the switch to position 2 for router mode. In router mode, the WGR101 lacks some of the advanced features found in the 3Com travel router, such as port forwarding and Dynamic DNS. These features aren't generally needed for a travel router, but more advanced users might prefer to have them. In terms of security, the Netgear travel router lets you disable SSID broadcast but provides only basic WEP encryption (though

THE NETGEAR WGR101 is easy to carry and easy to use.

THE SMC entry is more a travel AP, not a router.

that's probably adequate for most travelers).

On our tests, the WGR101 averaged 17.5 Mbps of throughput at close distances in 802.11g mode and fell off to about 3.9 Mbps at 80 feet. While it didn't perform as well as the 3Com travel router, its performance is still much faster than most hotel Internet connections and shouldn't slow you down.

Netgear WGR101

$99.99 list. Netgear Inc., www.netgear.com. ●●●○○

SMC SMCWTK-G WIRELESS TRAVELER'S KIT

Compared with 3Com and Netgear, the folks at SMC went in a different direction with the SMC SMCWTK-G Wireless Traveler's Kit. Unlike the other products, the SMC device lacks any routing capability. Thus, all of the traditional router functions such as NAT, an SPI firewall, and a DHCP server are missing. You'll therefore be relying on the host network for your IP address. You'll also be unable to share a single IP address with multiple computers in your hotel room.

Instead, the SMC product functions as a traditional access point and provides a number of modes you wouldn't expect in a device targeted at travelers. For example, it can be configured as a repeater, as an Ethernet client, or as either a point-to-point or a point-to-multipoint bridge.

All the functions on the SMC device are configured via software, instead of a switch. By default, the SMCWTK-G comes up in access-point mode and, like the other products reviewed, it will work—sans security—as soon as you plug it into your hotel room's broadband connection. Keep in mind that each computer associated with the device in AP mode will present its MAC address to the hotel billing sys-

SUMMARY OF FEATURES

Wireless Travel Routers

■ YES □ NO	Netgear WGR101	SMC SMCWTK-G Wireless Traveler's Kit	3Com OfficeConnect Wireless 54Mbps 11g Travel Router
List price	$99.99	$99.99	$89.99
Weight (ounces)	2.9	2.2	2.9
Size (inches)	4.0 x 2.8 x 0.9	3.4 x 2.5 x 0.8	4.0 x 2.8 x 0.9
WPA/SPI firewall	□■	■□	■■
PPTP and IPsec pass-through	■	□	■
SSID broadcast disable	■	■	■
Show attached devices	■	■	■
MAC address access control	■	■	■
Virtual server and port forwarding	□	□	■
DSL modem support (PPPoE)	□	□	■
Powered by USB port	□	■	□
AP/Router user limit	1 / 16	20 / 0	16 / 16
Repeater/DDNS	□□	■□	□■
PTP/PTMP bridge	□□	■■	□□
Ethernet client mode	□	■	■

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tem, so you might get billed for anyone sharing your connection. To prevent this, you must enable security and limit access to only your own MAC address. In our testing, the SMCWTK-G performed very well. It delivered 23-Mbps throughput at close range and a solid 5 Mbps at 120 feet.

If you need the advanced bridging modes offered by the SMCWTK-G, this is the device for you. But if you need just the more traditional road warrior features from your portable wireless traveling companion, you're better off buying the 3Com OfficeConnect Travel Router.

SMC SMCWTK-G Wireless Traveler's Kit

$99.99 list. SMC Networks Inc., www.smc.com. ●●●○○

3COM OFFICECONNECT WIRELESS 54MBPS 11G TRAVEL ROUTER

PC MAGAZINE EDITORS' CHOICE

At first glance, the 3Com OfficeConnect Wireless 54Mbps 11g Travel Router appears almost identical to the Netgear WGR101. But additional features—as well as the $10 lower list price—make the 3Com entry a better buy and earn it our Editors' Choice.

The 3Com router has four modes of operation, controlled by a sliding switch. In position 1, it acts as a traditional wireless access point. In position 2, it acts as a router with traditional router features such as NAT (Network Address Translation), an SPI firewall, and a DHCP server to provide you with an IP address, port forwarding, and even a DMZ and DDNS capabilities.

Position 3 is reserved for configuration. In this mode, the OfficeConnect intercepts your first Web page request and redirects you to the configuration page of the device. This greatly simplifies setup. Switch position 4 puts the device into Ethernet client mode, allowing you to connect with an existing wireless network.

If you are unconcerned with wireless security, you can just plug in the travel router to your hotel room's broadband connection (in either AP or router mode) and connect without further configuration. But for the security-conscious, the 3Com device supports WEP and WPA, as well as a MAC control list and disabling of SSID broadcast.

THE LOWEST-PRICED router we tested, the Office Connect, is also the most full-featured.

On our tests, the OfficeConnect achieved slightly better than 20 Mbps of throughput at close distances and 11.5 Mbps at 80 feet—certainly more than adequate range for most hotel rooms.

3Com OfficeConnect Wireless 54Mbps 11g Travel Router

$89.99 list. 3Com Corp., www.3com.com. ●●●●○

Toshiba's Multimedia Dream Machine

BY CISCO CHENG

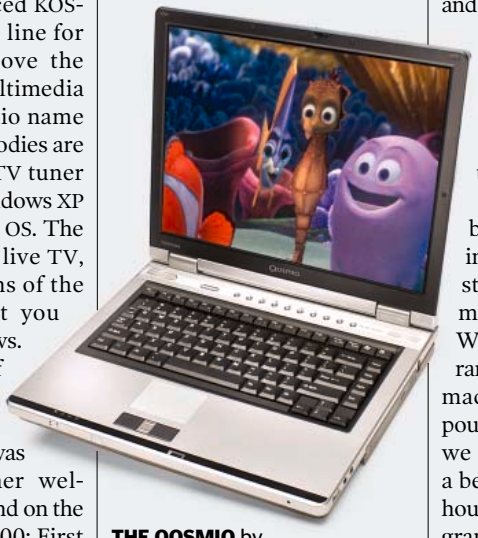
PC MAGAZINE EDITORS' CHOICE

If you had to invent the ultimate multimedia dream portable, Toshiba's new Qosmio line would be the blueprint. The **Toshiba Qosmio E15** takes you on an AV journey and delivers features that will send chills down your spine.

Qosmio (pronounced KOS-mi-o) is a brand-new line for Toshiba, slotting above the Satellite family of multimedia portables. The Qosmio name indicates all the AV goodies are present, including a TV tuner and the Microsoft Windows XP Media Center Edition OS. The tuner lets you watch live TV, and the PVR functions of the operating system let you pause and record shows.

The centerpiece of the E15 has to be the bright 15-inch screen. Our DVD experience was mesmerizing. Another welcome feature (also found on the new HP Pavilion dv1000; First Looks, October 5): You can watch a DVD movie or play a music CD without having to boot into the OS.

The Qosmio's features seem to be endless. In addition to a coaxial dongle, Toshiba also throws in a dongle for component video (HDTV) and a standard RCA jack video-in hookup. There's also an S/PDIF jack, a 3-in-1 (XD, SD, MS) memory card reader, four USB 2.0 ports, and a FireWire port. Toshiba has partnered with Harman Kardon for the internal speakers. The Qosmio also supports the SRS surround-sound audio codec.



THE QOSMIO by Toshiba is a PC, PVR, DVD burner, and multimedia center in one.

The river of multimedia keys is a great addition. Toshiba has included several quick-play keys that launch the TV tuner and DVD player. A composite-in key allows for fast switching to your connected camcorder or Xbox, while the TV-out button routes images from the notebook to a monitor or TV.

The E15 has the chops to back up its multimedia intentions. Its Business Winstone 2004 (19.5) and Multimedia Content Creation Winstone 2004 (22.5) scores rank as very good for a mobile machine. Given that the 7.8-pound system is fairly portable, we would have liked to see a better BatteryMark score (2 hours 14 minutes). The E15's 3D graphics performance was not earth-shattering, but its scores of 820 on our 3DMark03 test and 30.8 frames per second on the Serious Sam demo test indicate that it will get you some good gaming time.

No portable we've seen yet matches the E15 feature for feature. The Sony VAIO VGN-A190 offers a similarly bright screen and comparable performance, but the E15 delivers more. That said, if you don't need the TV tuner or Media Center OS, you can save a few hundred dollars and opt for the HP Pavilion dv1000, our other Editors' Choice among multimedia portables.

So what's behind that funny name? The Qosmio E15 is a personal computer, an LCD TV, a PVR, a DVD recorder, and an island for AV connections. The price might be a little steep for most, but considering what you get, it's very fairly priced.

Toshiba Qosmio E15

With Intel Pentium M 735 (1.7 GHz), 512MB DDR-SDRAM, 80GB hard drive (5,400 rpm), nVidia GeForce FX Go5300 graphics, 15-inch LCD, DVD±RW drive, 802.11g wireless, Microsoft Windows Media Center 2002. $2,699 direct. Toshiba America Information Systems Inc., www.toshiba.com.
OVERALL ●●●●◐ Music: 75 (out of 100); Photos: 79; Video: 76; Gaming: 71

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Ghost 9.0 Modernizes Backups

BY EDWARD MENDELSON

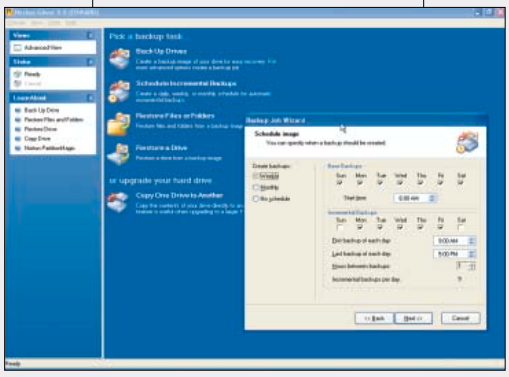
PC MAGAZINE EDITORS' CHOICE

Symantec's Norton Ghost has a long history of saving Windows systems by creating backups of a full drive that could be stored on—and restored from—another partition on a hard drive, removable media, or even across a network. Ghost got the job done, but its technology lagged behind the rival Drive Image.

With **Norton Ghost 9.0,** the program finally catches up with Drive Image—because it essentially *is* Drive Image, which Symantec picked up when it acquired PowerQuest last year. This enhanced release's features include incremental backups, the ability to restore a system to the state it was in at a specific time, and a file browser that can pluck individual files and folders from backup images.

Ghost 9.0 drops the gloomy gray interface of earlier versions for a bright, wizard-based one in which you create backup images either manually or on a preset schedule of full and incremental backups. You can make manual backups to any storage medium, including removable drives, but scheduled backups can be made only to your local hard drive or to network drives. When you need to restore, you start up from the bootable CD, built on Microsoft's Windows PE (Preinstallation Environment), which slowly but surely finds network drives from which to restore images.

The new version can also restore backup images created by earlier versions of both Ghost (thanks to the inclusion of Ghost 2003 in the package) and Drive Image. It retains Drive Image's ability to load a backup image as if it were a real drive with a drive letter.



GHOST 9.0'S MORE INVITING UI includes wizards for common tasks, such as setting up backups.

Overall, we slightly prefer Ghost 9.0 to our previous Editors' Choice in this category, the Acronis True Image 7.0. Although Acronis is still excellent, Ghost 9.0 gets the nod thanks to its ability to put a Windows preboot environment on startup disk so that you get the same networking and hardware support on the emergency disk that you get inside Windows (Acronis uses a Linux-based emergency disk). Ghost also has the ability to mount an image file as a drive letter. So all things considered, Ghost 9.0 is the essential tool for rescuing a complete system. It belongs in every serious PC user's toolbox.

Norton Ghost 9.0

$69.95 direct. Symantec Corp., www.symantec.com. ●●●●◐

Microsoft Works 8: Too Simple?

BY EDWARD MENDELSON

Microsoft never stops trying, and with the **Microsoft Works 8** productivity pack, the company is still trying to bring the power of an Office suite to home users. The latest version of this all-in-one suite (word processor, spreadsheet, database, and various templates for each) doesn't quite succeed. Many of its individual parts are impressively elegant, but the overall product feels more like a grab-bag of parts than an integrated whole.

The heart of the Works package is its traditional set of easy-to-use, Office-style applications. The word processor supports footnotes, endnotes, columns, tables, and automatic spelling corrections. It also offers expertly designed "palettes" of coordinated fonts and coordinated colors that can be applied to a whole document with a click on your selection in a format gallery.

A simple calendar application supports multiple calendars for different family members, with the option of sharing appointments among more than one calendar. Also provided is an elegant small-scale photo album program that can print or mail collections or individual photos with a mouse click.

ONE STRONGPOINT IN WORKS 8 is the wide range of useful templates, all housed in a cheery interface.

Microsoft tries to make the programs accessible to novice users through a cheerfully graphics-rich Task Launcher. The Launcher includes prebuilt templates for common documents, such as instructions for babysitters. The Projects area collects multiple templates that can be used together to, say, plan a family reunion or school schedule, or to organize a fantasy sports team.

The trouble with Works templates is that you can't modify them; the fax template always says "Company Name" when you start it up, not your real company's name. After you replace the boilerplate text, you can follow complex instructions to save a new copy of the template with the name you want already in it, but the new copy gets saved in a special "Personal Templates" category, not in the "Letters & Labels" template with the standard fax template.

If you're looking for an inexpensive, easy-to-use office suite, you'll get more power and better programs in Corel WordPerfect Family Pack 5 ($79). Or you can try the slightly less friendly OpenOffice.org 1.1.2 (*www.openoffice.org*), which is highly compatible with Microsoft Office.

Microsoft Works 8

$49.95 direct. Microsoft Corp., www.microsoft.com ●●◐○○

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MSN Music Still a Work in Progress

BY TROY DREIER

The emerging area of online music shopping has seen tremendous growth lately, with innovations cropping up from iTunes, Musicmatch, and RealPlayer. Now Microsoft has entered the arena and has brought, well, the Microsoft name. The **MSN Music** site, now in public preview and set for its full-featured debut in mid-October, instantly makes Microsoft a major player in the field, although the store has a decidedly me-too feel about it right now.

When we tested it, MSN Music offered over 500,000 tracks; it should have one million by its official launch date, putting it on a par with Apple's iTunes Music Store. One welcome innovation: Users can access the store through a browser—or via the excellent Windows Media Player 10 multimedia jukebox app (First Looks, October 5)—and get the same clean white-themed interface in each. Purchased tracks are 160-Kbps variable-bit-rate WMA files, and buyers can play them on up to five different machines or burn a playlist seven times.

THE MSN MUSIC EXPERIENCE looks and feels the same whether you arrive via a browser or Media Player 10.

The UI is clean, but almost too much so: The store has a bare-bones feel to it. The front page offers current selections, as well as links for concert tickets and music news. You can browse within 20 different genres, looking at the top albums, top songs, and editors' picks for each. Album pages have brief reviews and links to related artists. A handy rating feature lets you rate any song from one to five stars and see other people's ratings. You can also read user reviews, although that requires clicking to a different page.

MSN Music's helpful search page gives you results in three sections—albums, artists, and songs—so that you get complete results for every search. We also like the free radio options, which mimic the playlists of radio stations around the country.

Beyond that, there isn't much to MSN Music. There are no audio books, gift certificates, or allowances. You won't find Billboard charts, an online magazine, or a community forum, and there are no ways to share your finds with your friends. That makes browsing dull—and makes it hard to find interesting new artists.

Microsoft says it will be adding such features in the coming year, as the service matures. Until it gets there, try Napster or the ever-excellent iTunes Music Store.

MSN Music

99 cents for most tracks, $9.90 for most albums. Microsoft Corp., http://beta .music.msn.com. ●●●○○

The Sims 2 Proves Grown-Up Games Still Live

BY TROY DREIER

PC MAGAZINE EDITORS' CHOICE

If first-person shooters don't exactly knock you dead and racing games make you feel like you're going around in circles, we have good news: The Sims are back—and they're better than ever.

For those unfamiliar with the PC world's most popular game ever, the Sims is an alterworld in which you create characters and live their lives for them, guiding their careers, looking for romance, and upgrading their homes. The original spawned several expansion packs as well as console, handheld, and online versions.

Now those virtual people have made a giant leap forward with **The Sims 2.** We're happy to say that it's as much fun as it is great-looking. The first things you'll notice are the cinematic graphics and the ability to change the viewing angle in any way, including zooming in or out. Creating new Sims is a blast with the completely customizable controls, which let you get the exact look and personality you want. Create a family and the kids will inherit genetic traits from their parents. Sims now grow old and eventually die.

THE NEW WANTS AND FEARS PANEL in The Sims 2 lets you gain points by fulfilling short-term goals.

You choose from five aspirations for your Sims—wealth, knowledge, family, romance, or popularity—that give you targets to strive for and stop the game from feeling random. Your aspirations determine what you'll see on the new Wants and Fears Panel, which provides short-term goals. Fulfilling wants also improves your Sims' mood.

The game includes three neighborhoods: Pleasantview (which houses the Goths, a Sims staple), Strangetown (the place for UFO encounters and unusual medical experiments), and Veronaville (where a familiar romance has bloomed between two teens in the feuding Capp and Monty families). There are dozens of odd characters to play if you don't feel like creating your own.

Starting up The Sims 2 is slow, since there's so much information to load, and the system requirements are high. But we found it just as addictive as the original. Now bring on the expansion packs.

The Sims 2

$49.99 direct. Electronic Arts Inc., http://thesims2.ea.com. ●●●●◐

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Collaboration for the Masses

BY CADE METZ

Do you spend your day trying to collaborate with faraway people via phone and e-mail? Is your business spread across multiple offices? Does it work closely with outside clients? If you answered yes to any of these questions, it's high time you adopted an Internet collaboration tool—a set of graphical applications that lets you easily interact with colleagues via your own private network.

There are plenty of enterprise-level solutions aimed at Fortune 1000 companies, and now a growing number of affordable Web-based services are aimed at small to midsize companies. We tested three to see how they compare. 37signals, a Chicago-based Web design firm, recently debuted **Basecamp,** a simple, inexpensive collaboration tool. And after a few facelifts, two of the more advanced tools, **Groove** and **Intranets.com,** are more impressive than ever.

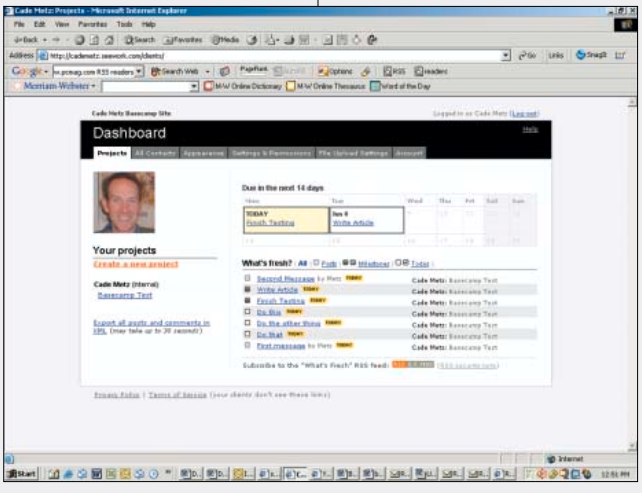
Whichever you choose, it's time to make the switch. When it comes to long-distance collaboration, phone calls and e-mails just don't cut it.

Basecamp

When 37signals started designing Web sites in 1999, it began each project by setting up an extranet—a private network that allowed easy communication between a company and its clients. Colleagues could post messages to this extranet, set up to-do lists, schedule meetings, and even upload and download files. (Full disclosure: Ziff Davis Media recently hired 37signals to review the *PC Magazine* Web site.)

Soon, the company built a Web-based application that could build these extranets on the fly, so designers wouldn't have to code each one from scratch. Somewhere along the way, it realized that such a tool could be useful to almost any business—especially to businesses that do regular work for outside clients.

Enter Basecamp. This slick, simple project management application is billed as a "client extranet tool for creative-services firms," but its audience is much broader. It's also used by accounting firms, banks, public schools, and wedding planners, and it needn't be limited to extranets. It can also build intranets (private networks for use within a small to medium-size business).



THE UNCLUTTERED DASHBOARD view in Basecamp lets you see tasks, message threads, and more at a glance.

There really isn't much to this tool—but that's the point. It's so simple that anyone with a passing familiarity of the Web can quickly set up a private site. In our hands-on trial, we were up and running in no time, and we found it a much better way to organize projects than the endless threads and subfolders that people have to contend with when using e-mail as their project collaboration tool.

Basecamp gives users the basic tools needed to post messages, tasks, and schedules. You can quickly add and remove users. You can customize the colors and basic layout of your site. You can even adorn each page with a small company logo. One interesting feature power users will like: Basecamp lets you export items to an XML file, which can be used with other sites and applications. You can even arrange for Basecamp to send updates to an RSS reader each time your site changes.

The service does have its limitations. Basecamp lacks some higher-end collaboration features, such as whiteboards and chat. And you need to set up your own FTP server if you want to be able to share files. That said, the price is certainly more attractive than that of full-blown collaboration sites. A free version lets you set up a site for managing a single project (but doesn't allow for file uploads), while the basic plan ($19 per month) lets you create up to ten extranets.

Basecamp

Introductory plan (one project, no file uploads), free. Basic plan (10 projects, FTP file upload), $19 per month. Plus plan (25 projects, FTP file upload), $39 per month. Premium plan (unlimited projects, FTP file upload), $59 per month. 37signals LLC, www.37signals.com.

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Groove Virtual Office, Professional Edition, Version 3.0

Groove Virtual Office, now in Version 3.0, takes a slightly different approach to online collaboration. Instead of creating a traditional intranet or extranet accessible from a Web browser, it sets up what the company likes to call virtual workspaces: customizable windows where people can not only share information but interact in real time. Some workspaces, for instance, have chat clients built right into them, letting you instantly trade text messages with collaborators. You can even communicate via Voice over IP.

With Groove, unlike with Basecamp and Intranets.com, you have to install a 40MB software client before you can start collaborating, and you'll need an additional 60MB for storing data. That makes it less ideal than the others for dealing with outside clients (as opposed to inside employees). Groove operates like a peer-to-peer network: All data is stored on your machine and the machines of your collaborators—not on third-party servers. When you first start the app, up pops the Groove LaunchBar, a sliver of a window where you set up, manage, and launch your various workspaces and maintain an interactive list of the people you're collaborating with.

You can create a new workspace simply by clicking on a link at the top of the LaunchBar. A wizard lets you choose what type of workspace you'd like to create, and just like that, the workspace pops up on your desktop. You can create a *standard* workspace with a discussion forum and a tool for sending files back and forth across the Net. You can create a special *file-sharing* workspace that lets multiple people edit

the exact same file across multiple machines, automatically synchronizing changes from each user, or you can create a *custom* workspace, drawing from 15 different templates.

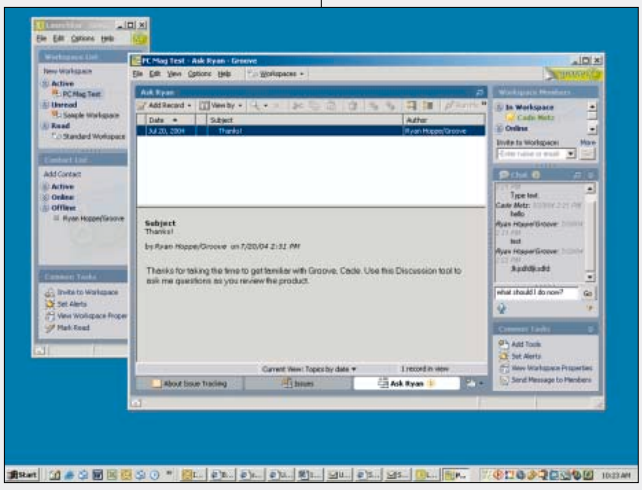
Once your workspace is up and running, you can add all sorts of new tools at your leisure. As noted, you can add chat or VoIP clients. You can add a whiteboard that lets you sketch out ideas in freehand. You can add a Pictures tool that lets you instantly display digital images in the workspace. You can add notepads, calendars, or forms, and the list goes on.

Bringing in new collaborators is a breeze. Those who are already Groove users can be seamlessly sent an invitation to your workspace over the Groove network. Those who aren't can be sent an e-mail from either your workspace or your LaunchBar with instructions on how to download and install the application.

Even when you're not using a workspace, Groove runs in the background, and when someone comes online or posts new information, you can arrange for various alerts to pop up on your Windows taskbar. Simply clicking on an alert will then take you to the appropriate workspace.

Groove does take a bit of learning. You'll likely need a few days before you get the hang of the basic process, and even then you won't know all its various tricks. But in the end, it's more powerful than Basecamp and Intranets.com, and it's competitively priced. You can purchase the full Professional Edition of Groove Virtual Office for a one-time fee of only $179. A less expensive version of the product, the File-Sharing Edition ($78), lacks certain high-end features, such as the ability to conduct Web conference–style virtual meetings, to design and customize forms, and to integrate with Microsoft's virtual workspace product, SharePoint.

If you're an experienced computer user and you work with other experienced users, Groove is the way to go. Just make sure you're all running fairly new PCs. Though the company has improved the app's performance, it can still put a slight drag on older systems. If you're less comfortable with PCs and PC apps or need to invite a rotating list of outside clients to collaborate, you'll be perfectly happy with Basecamp or Intranets.com.



THE VIRTUAL WORKSPACES in Groove are customizable windows where people can share information and interact in real time.

Groove Virtual Office, Professional Edition, Version 3.0

$179 direct. Groove Networks Inc., www.groove.net. ●●●●○

Intranets.com

PC MAGAZINE EDITORS' CHOICE

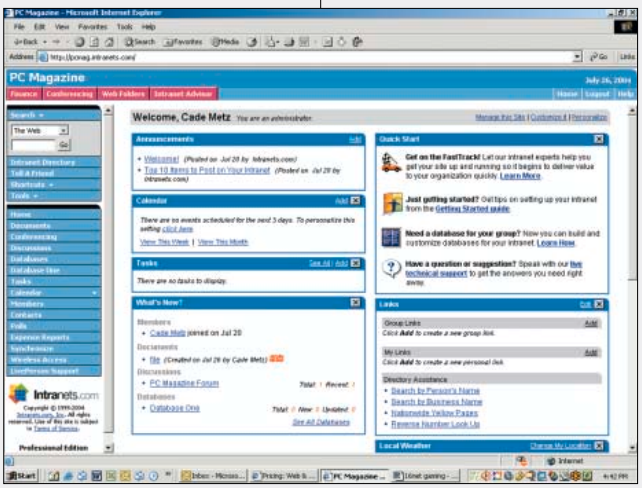
As the name implies, Intranets.com is ideal for collaboration within your company. But it works just as well as an extranet, letting you interact with outside clients. In addition to sharing to-do lists, calendars, and files, you can set up and manage your own online databases. You can even do Web conferencing à la WebEx, giving others a live view of PowerPoint presentations and other documents and applications running on your PC.

Much like Basecamp, Intranets.com runs inside your Web browser, and you can register for the service and get your own private site up and running easily. Each of the app's many tools can be accessed from a toolbar running down the left side of your browser window. A Document link lets you post files to your site, a Discussion link lets you organize online discussion forums, and so on.

All the tools—including the one that builds online databases—are wonderfully intuitive, and once you get the hang of them, you can use a convenient shortcut menu to take care of particularly common tasks in half the time. Should you have trouble learning the ins and outs of these tools, a whole suite of help utilities is available from your site's home page. You can even chat live with a support technician during business hours.

The service is preferable to Basecamp, if only because you can share files without setting up your own FTP server, but its high-end tools tip the balance even further. We're especially impressed with the new Web conferencing tool. Not only can you share your desktop across the Web; you're also given your own 800 number for arranging a concurrent conference call.

Naturally, such tools are going to cost you a bit more. Your basic site would cost anywhere from $59.95 per month for five users to $4,000 a month for 1,000 users, and you'll have to pay extra for Web conferencing. A $149.95 monthly fee lets you hold conferences with up to 25 people, and phone service will cost 12 cents per minute per line. Of course, when you compare this with the prices you'd pay to use WebEx or LiveMeeting, it's an absolute steal.



WITH ITS WEALTH OF TOOLS and features, the Intranets.com user interface grows a little more cluttered than the others, though learning to navigate is easy enough.

Intranets.com

For five users, $59.95 per month and up; for Web conferencing, $149.95 per month; for audio conferencing, 12 cents per minute per line. Intranets.com Inc., www.intranets.com. ●●●●◐

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E-Mail Clients Best Outlook in Some Ways

BY JIM LYNCH

Plenty of folks use Microsoft Outlook or Outlook Express as their e-mail and PIM (personal information manager) program. But there's much more to choose from than just Microsoft's software. **Barca** and **Bloomba Personal 2.0.1** offer similar functions to Outlook and OE. Both are solid alternatives for anyone not happy with Microsoft's offerings.

Barca

If you're already an Outlook user, you'll feel right at home with Barca: Pretty much all of Barca's PIM functions are eerily reminiscent of Outlook. In addition to housing your e-mail, Barca offers a calendar, a contact manager, a planner, a notes area, and a task pane.

Barca also has robust e-mail features that include the usual kinds of accounts (POP, IMAP, and Authenticated POP, as well as newsgroups), message and spam filters, a quote bar, emoticons, a spell checker, and quite a bit more. It also offers flexible attachment handling: Attachments can be previewed within the message, extracted upon receipt of the message, or left encoded within the message.

Barca uses the same e-mail engine as its sibling, the well-known PocoMail client ("Can E-Mail Survive?" February 17). Its interfaces are fairly similar to Outlook's, though we think that Barca has a cleaner look and feel. Functions such as Today, Calendar, Inbox, Drafts, and so on are all accessible via the left frame or, in some cases, from the toolbar at the top of the application window.

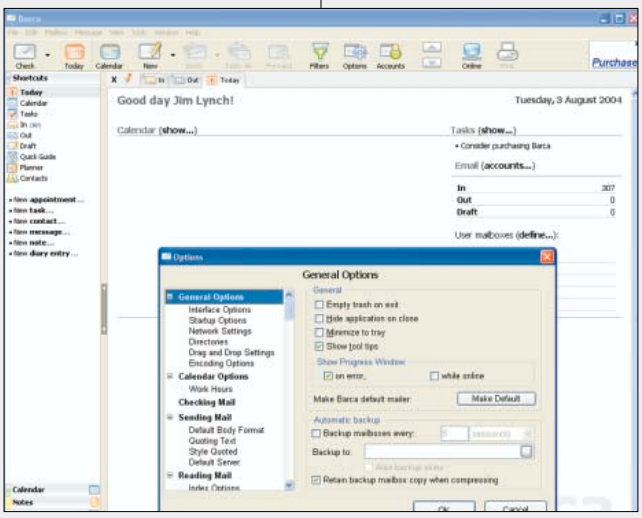
If you're moving from another program to Barca, you can import your e-mail messages (Outlook Express, Netscape, Eudora, Pegasus, EML files), calendar (ICS and VCS format), tasks, and address book (Netscape, Eudora, or CSV files). Unfortunately, you can't currently import e-mail from Outlook, and you can't import the Windows Address Book files used by Outlook Express.

In addition to the usual Notes feature, which lets you create electronic "sticky notes," Barca includes a Diary function. This lets you write notes using more advanced text formatting, such as colored text, boldface, and various fonts.

Given all of the recent virus activity on the Internet, security is extremely important for any kind of e-mail client. Barca takes an unusual but effective route to ensure the security of your e-mail: Instead of using an Internet Explorer component to preview HTML messages, it has its own built-in HTML viewer. And it doesn't use VBScript or JavaScript, relying instead on its own highly focused PocoScript. Barca includes the ability to launch your virus scanner to check for standard viruses. It also lets you strip out all HTML from an e-mail message or neutralize any potentially dangerous HTML tags in the message. Overall, we are very pleased with Barca's ability to maximize security for its users while still remaining flexible for those who prefer a lower level of security.

Barca is a fine option for anyone looking for an alternative to Outlook and OE. If you're not sure you can live with the few shortcomings in this 1.0 release, you can try the 45-day evaluation edition for free. It's well worth the download.

Barca
$59.95 direct. Poco Systems Inc., www.pocosystems.com. ●●●●○



BARCA'S INTERFACE is reminiscent of Microsoft Outlook's UI, though we found it a bit cleaner overall.

Bloomba Personal Edition 2.0.1

Like Barca, Bloomba has all that a PIM needs to replace Microsoft Outlook and Outlook Express. It has the usual features such as a calendar, contacts, and e-mail (with a spell-checker), and its interface and overall look and feel remind us of Outlook Express.

Unfortunately, it lacks a planner as well as the sticky notes found in Barca. It has Barca beat when it comes to easy viewing of your data, however. For example, Bloomba's calendar is set up to make seeing your schedule for that day easy—even while you're reading and replying to e-mail. The calendar is viewable at the bottom of the left frame while you continue to work in the right frame.

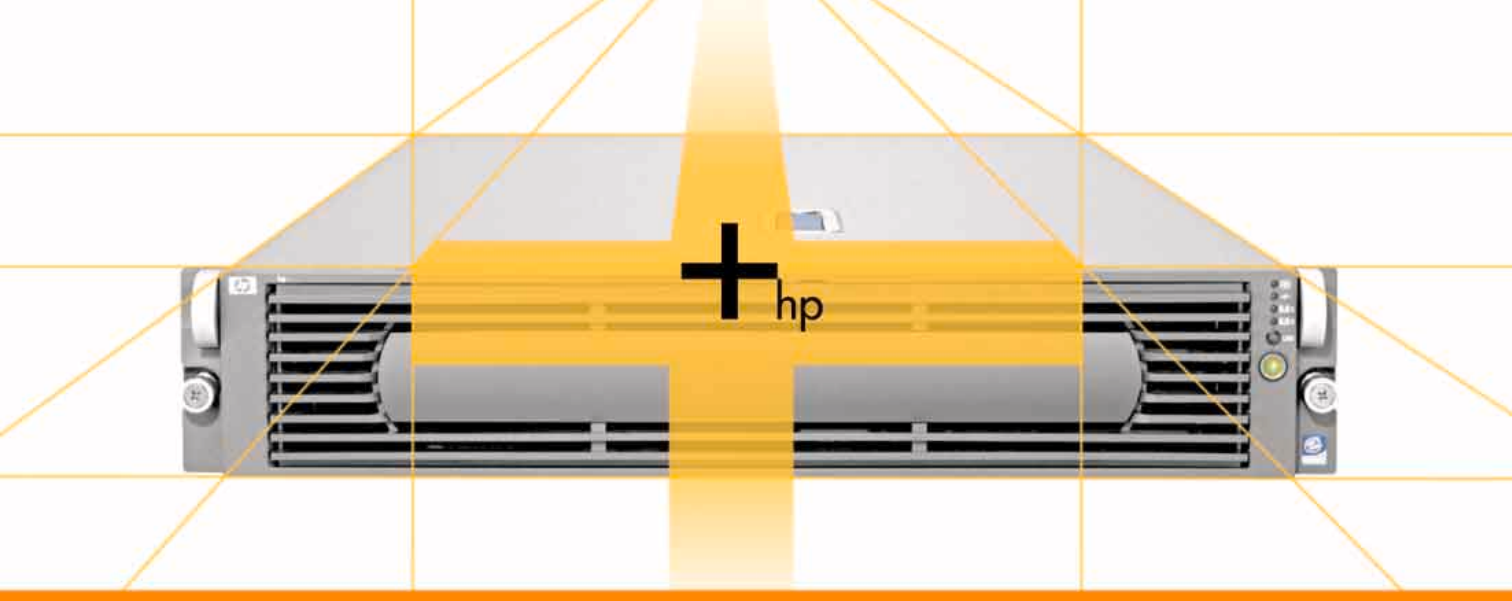
Another plus: Bloomba offers a built-in RSS newsreader, a very handy and unexpected feature. And Bloomba Professional (the more advanced version of the software) lets you share your calendar easily and sync your appointments with the calendars of coworkers, friends, and family. You can also schedule and confirm meetings with coworkers in your office or remotely.

Folders, Saved Searches, and Smart Groups are all easily accessible via the left frame in the UI. Subject headers and message text appear in the right-hand frame. Unlike Barca, Bloomba lets you import directly from Outlook. You can also import from Netscape, Outlook Express, and Eudora, as well as Vcard, Mbox, and iCalendar formats.

Unfortunately, Bloomba lets you export mail only in Mbox format and doesn't have a mechanism for exporting Calendar entries or Contacts. Barca's export feature currently offers more options than Bloomba's. And whereas Barca supports multiple e-mail account types, Bloomba works only with POP3 accounts.

One feature we really like in Bloomba is Smart Groups, which let you manage mailing lists, RSS feeds, and customized incoming messages with ease. We could opt to move Smart Group messages out of our inbox immediately, move them after a specified time, or simply delete them after a certain number of days. If you're on a high-traffic mailing list or if you subscribe to lots of RSS feeds, you'll find the Smart Groups feature very useful indeed.

The newsreader offers some



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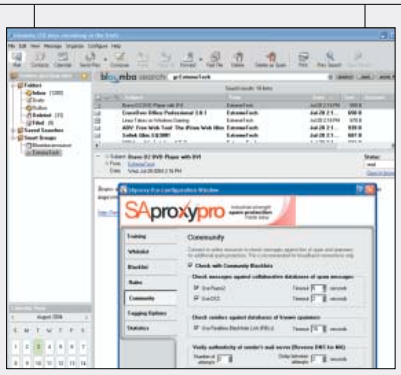
useful features. You can customize your RSS feeds to download as often as you like. You can also have your RSS feed messages moved automatically into a folder, and you can opt to have them deleted automatically after a set number of days or leave them until you decide to delete them manually.

But Bloomba's defining feature is its search tool, which is perfect for e-mail pack rats who never delete anything. It lets you search attachment contents as well as message text, and you can save your searches. There's also a one-click search option that lets you click on an icon next to a sender's name or on the subject header of an e-mail to pull up a complete list of e-mail from that sender.



BLOOMBA USES SAproxy Pro to provide strong spam control that lets you customize the way spam is blocked.

The advanced search function offers even more customization options than Google's impressive (but still beta) Gmail service (First Looks, August 17). You can search individual folders or search by status, category, or date range. Keyword searches can be done anywhere in the text or in the subject line of a message. And you can also filter your searches based on From/To/CC, lines, and more.

Another important feature is Bloomba's built-in, industrial-strength spam protection (via Stata Labs' SAproxy Pro). You can employ whitelists or blacklists and customize your tagging options and rules. If you're on a broadband connection, you can also opt to check your messages against community blacklists—a very powerful tool for keeping up with spammers.

Although Bloomba lacks some of the bells and whistles that Barca offers, it holds its own as an e-mail client. Its search features are excellent and its Smart Groups are very helpful. The program is worth taking a look at if you're in the market for a new e-mail client with basic PIM capabilities.

Bloomba Personal 2.0.1

$59.99 direct. Stata Laboratories Inc., www.statalabs.com. ●●●◐○

Qnext Does IM Better

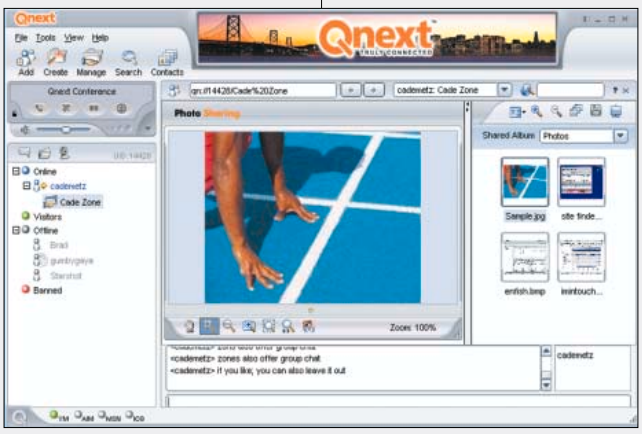
BY CADE METZ

Think of **Qnext** as the Swiss Army knife of Internet communication tools. With this slick suite of applications (available free from the Qnext Web site), you can send and receive instant messages, set up group IM chats, initiate audio chats, start a video conference, and take part in online gaming. You can also send and receive large numbers of files and photos, and even log on to a distant machine and do full-screen remote control (much as you could with a remote-control program such as GoToMyPC). All told, the public beta we tested (the official first release is slated for fall) is impressive.

When you launch Qnext, it looks like any of the popular IM clients. But despite all the new tools woven into the Yahoo! and MSN messengers, including audio and video conferencing and online games, Qnext is far more powerful than any other IM client on the market. For one, your friends and colleagues needn't be running Qnext to trade messages with you. Qnext serves as a universal IM client: It can trade messages with any of the leading clients. If you're already using one of those, Qnext will import your existing buddy list.

Qnext can also operate much like a private Web server, giving friends and family access to files and photos sitting on your hard drive. You simply select the files and photos you wish to share and post them to what Qnext calls a *zone*, a virtual drive that can then be accessed by anyone with the proper permission. Currently, zones can be accessed only through Qnext, but the company plans to allow access through an ordinary Web browser.

And then there's the remote-control tool. It isn't quite as fast or as slick as GoToMyPC Personal ($19.95 per month), but it gives you full access to a remote desktop. Once Qnext is loaded on your system and you turn on the QnextMyPC tool, you'll be able to log onto the system from any Java-enabled browser on the Web. QnextMyPC (and the QnextPhoto sharing features) are free now and for a limited (but unspecified) time after Qnext launches; after that, they will be paid premium services.



FREE FOR NOW, the QnextPhoto service lets you share photos on your hard drive with others.

Built with Java, Qnext operates as a true peer-to-peer service. When you first log on, it briefly talks to the company's servers, but after that, it communicates directly with the client PCs. When you send an instant message to another Qnext client, for instance, the message travels straight from your system to theirs. The same goes for files, photos, audio and video streams, and the next move in your online game.

Unfortunately, only one online game is currently available (a version of the old Chinese game Go), but the company has more on the way. The only rub is that the client doesn't run all that well on older machines. You'll need at least a 500-MHz Pentium III, 128MB of memory, and maybe more.

Qnext is worth downloading, if only for the universal IM client. You can try out the other services for free and then make an informed choice about which ones are worth the freight once the meter starts running.

Qnext

Free download (advanced services free only for a limited time). Qnext Corp., www.qnext.com. ●●●●○

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Three CCDs at an Affordable Price

BY GLENN MENIN

With its three-CCD video and 1.2-megapixel still-image capture, there's a lot to like about the handy, surprisingly affordable **Panasonic PV-GS120** MiniDV camcorder. The three-CCD setup, combined with a Leica Dicomar 10X optical zoom lens, helps the PV-GS120 produce sharp, well-exposed video with accurately reproduced colors.

The PV-GS120 fits comfortably in the right hand. Users have easy access to zoom and basic operating controls. The generous 2.5-inch articulated LCD panel flips out 90 degrees and can swivel 270 degrees.

The PV-GS120 captures raw digital video to Mini-DV tape and provides AV ports for analog streaming via component connection to a TV or other video device. It also has a FireWire port for transferring video to a computer, a USB port for moving still images, and a Secure Digital card slot.

The PV-GS120 can capture still images rather than simply grabbing and deinterlacing 720-by-480 video frames. But its 1.2MP JPEG images (1,280-by-960) fall short in terms of quality when compared with those of 1.2MP digital still cameras. In testing, our still-life capture (in simulated daylight) showed a poorly exposed, grainy image with a blue cast and soft focus.

GOOD VIDEO QUALITY makes the PV-GS120 worth a look.

As for video quality, we could easily see the unit's improvement over the single-CCD Panasonic VDR-M50 DVD camcorder. The three-chip camera reproduced colors well and properly reproduced the color temperature of our simulated daylight lighting. On our EIA video resolution chart, the camcorder scored a good 325 lines. The PV-GS120 also performed well on our action sequences; the auto-focus was quick to adjust for movement. Audio fidelity was good, too.

Panasonic PV-GS120

$699.95 list. Matsushita Electric Corp. of America, www.panasonic.com. ●●●◐○

DVD Camcorder Is Convenient, But...

BY GLENN MENIN

The **Panasonic VDR-M50** is a single-CCD subcompact video camcorder that records directly to DVD media. If you want a device that will produce DVDs you can pop into your DVD player and watch on a TV, you'll find the VDR-M50 convenient. But if you want to record to the higher-quality DV format (as opposed to MPEG-4), this isn't the camcorder for you. Both the video and the still images leave something to be desired.

We've tested DVD camcorders from Sony and Hitachi in the past, but the VDR-M50 is the first one we've run through PC Magazine Labs' new suite of video tests (*www.pcmag.com/insidepclabs*). We selected the DVD-RAM output for our quality tests, as it allows for a higher bit rate (3 to 10 Mbps). Our jurors scored the VDR-M50's sharpness as good, but they were less impressed by its exposure and color realism. The colors appeared too warm and oversaturated. Shadowy areas were very dark and did not afford as much detail as others we've tested.

IT MAKES DVDS, but the VDR-M50's video quality is subpar.

The VDR-M50 scored an acceptable 350 lines on our EIA video resolution chart. It also compensated well in low-light conditions. Still-image capture ability was a bust, though: Our simulated daylight shot appeared dark and muddy, with a magenta cast, and details in the 640-by-480 JPEG were fuzzy.

If you lack the motivation or equipment to off-load video to a PC for editing, and instead plan on just shooting to DVD, you may find this an acceptable (if expensive) device. Enthusiasts, however, will be disappointed.

Panasonic VDR-M50

$799.95 list. Matsushita Electric Corp. of America, www.panasonic.com. ●●◐○○

IN SHORT

Kyocera Finecam SL400R

Pros: Stylish design. Speedy, with a great burst mode. Rich point-and-shoot feature set. Easy-to-understand menu system.
Cons: No lens cap makes this shirt-pocket shooter not so pocketable. No optical viewfinder. Produces only mediocre sharpness, with some exposure problems in both flash and daylight conditions.
Bottom line: This camera gets full marks for fun factor, style, and performance, but has worse image quality than its 3.2MP predecessor. The lack of a lens cap is worrisome.

$399.99 list. Kyocera Corp., www.kyocera.com. ●●○○○

Nikon Coolpix 3200

Pros: Focuses well in low light. Easy to use. Abundant scene select/scene assist modes (with guides).
Cons: Slow. No shutter or aperture priority modes. No selectable ISO. Unimpressive video mode.
Bottom line: The Nikon Coolpix 3200 is an entry-level compact digital camera that's easy to use, with an emphasis on scene select modes for foolproof shooting. The camera's image quality is acceptable for an entry-level camera.

$299 list. Nikon USA, www.nikonusa.com. ●●◐○○

Nikon Coolpix 4100

Pros: Images show good detail.
Cons: Slowest recycle time of any camera we've seen. Shutter lags enough that you'll miss many photo opportunities.
Bottom line: Despite its ease of use, the Coolpix 4100's performance should send even casual shutterbugs looking elsewhere.

$299.95 list. Nikon USA, www.nikonusa.com. ●●○○○

www.pcmag.com/cameras

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Not for Photos Only

BY M. DAVID STONE

Unlike some printers in the PIXMA line, the **Canon PIXMA iP4000** is clearly a photo printer: Its five inks include both a pigment-based and dye-based black, with the dye-based version aimed primarily at improving photo output. But like other PIXMA models, the iP4000 offers an impressive combination of speed and output quality for business applications as well.

Measuring 6.8 by 16.5 by 11.3 inches (HWD) and weighing in at 14.9 pounds, the iP4000 is the biggest of the PIXMA printers. It offers both a USB 1.1 and a parallel port for connection to your computer, as well as a second USB connector in front for printing from a PictBridge camera. It can duplex and has two 150-sheet input trays.

The iP4000's speed is impressive—and then some. On our photo suite, it averaged 1 minute 5 seconds for 4-by-6 photos and 2:36 for 8-by-10s. Among ink jets tested to date, only the $500 Canon i9900 (First Looks, June 22) has scored faster on our photo suite (at 30 seconds for 4-by-6 photos and 1:05 for 8-by-10s). The iP4000 also tied the iP3000 on our business applications suite, at 15:48. As a point of comparison, the Brother MFC-3420c AIO ("All-in-Ones: One for All," August 17) qualified as speedy for standard ink jets at 20:24.

Output quality is better overall than for most ink jets. The photo rating is nearly excellent, held back only by a slight tint in our monochrome test photo and in one color photo. Text and graphics are both a bit better than good. More than half of the test fonts are easily readable at 4 points. Graphics show just a hint of posterization and moderate banding in default mode. This level of output combined with the extraordinary speed could easily make the iP4000 your photo printer of choice.

THE CANON PIXMA IP4000 is a solid all-purpose printer.

Canon PIXMA iP4000

$149.99 direct. Canon U.S.A., Inc., www.usa.canon.com.
OVERALL ●●●●○ Text ●●●◐○
Graphics ●●●◐○ Photos ●●●●◐

Among the Best in Its Class

BY M. DAVID STONE

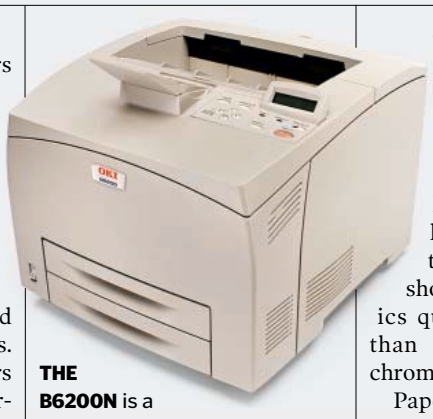
Oki Data laser printers often boast better speed than the competition. And the **Oki B6200n** ($700 street) is no exception. Whether you pick it based on the low price or the 25-page-per-minute (ppm) engine, the B6200n is way out in front. It also delivers better graphics and photo quality than most lasers. Any one of these three factors would make the printer interesting; the three together make it well worth your attention.

Network setup and driver installation are easy enough, so you don't need to know anything about networks. The setup program can find the printer on the network and take care of the rest of the installation without help. Oki Data says the printer will work with HP's WebJet Admin, Lexmark's MarkVision, and Xerox's CentreWare for remote management as well as Oki Data's own software.

Speed is one of the better arguments for the B6200n. The printer's total time on our business applications suite was just 7 minutes 19 seconds (using QualityLogic's equipment, *www.qualitylogic.com*). By comparison, the 27-ppm Lexmark E332n took 8:44.

Text quality was a bit low for a monochrome laser but good enough to earn a rating just short of very good. Graphics quality is good—better than that of most monochrome lasers.

Paper-handling options let you add duplexing and boost the B6200n's 400-sheet input capacity to a total of 1,500 sheets. Add in a 75,000 page-per-month duty cycle, and the result is an attractive choice as a medium-duty workhorse.



THE B6200N is a workhorse for the small office.

OKI B6200n

$700 street. Oki Data Americas Inc., www.okidata.com.
OVERALL ●●●●○ Text ●●●◐○
Graphics ●●●○○ Photos ●●●◐○

IN SHORT

Canon PIXMA iP1500

Pros: Low price. Faster than many standard ink jets for business applications as well as for photos.
Cons: No memory card slots. Ink cartridges hold little ink, making the printer suitable only for light-duty printing.
Bottom line: The $50 Canon PIXMA iP1500 photo printer offers an impressive combination of photo speed and quality for the price, along with acceptable speed and quality for text and graphics.

$49.99 direct. Canon U.S.A. Inc., www.usa.canon.com. OVERALL ●●●◐○
Text ●●●○○ Graphics ●●●◐○
Photos ●●●●◐

Canon PIXMA iP2000

Pros: PictBridge support for printing from cameras.
Cons: Relatively low-capacity ink cartridges make the printer suitable only for light-duty printing.
Bottom line: The iP2000 offers a good combination of performance and quality for the price, but it's hard to argue against spending another $20 for the Canon PIXMA iP3000.

$79.99 direct. Canon U.S.A. Inc., www.usa.canon.com. OVERALL ●●●◐○
Text ●●●○○ Graphics ●●●◐○
Photos ●●●●◐

Canon PIXMA iP3000

Pros: Fast performance for both photos and business applications. Duplex printing. Two input paper trays.
Cons: No memory card slots.
Bottom line: The Canon PIXMA iP3000 is the rare photo printer that boasts high speed for everything: photos, graphics, and text. Solid output quality makes the iP3000 a good choice as an all-purpose printer.

$99.99 direct. Canon U.S.A., Inc., www.usa.canon.com.
OVERALL ●●●◐○ Text ●●●○○
Graphics ●●◐○○ Photos ●●●●◐

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Content Management for Smaller Shops

BY SAHIL GAMBHIR

PC MAGAZINE EDITORS' CHOICE

Contribute has always been true to its core audience: small businesses and groups that need to maintain sites but that don't have extensive Web design and coding resources. The new **Macromedia Contribute 3** delivers more features as well as solid content management.

Contribute 3 comes with dozens of slick, professional-looking site templates. Users edit a site by opening the page in an embedded Web browser and using a standard arsenal of formatting tools. New in Version 3 are image-editing functions and an international spell-checker. You also get a Google search bar widget.

With its built-in Dreamweaver MX 2004 engine and full support of CSS rendering, Contribute 3 can serve as a complete site-building tool as well, assuming your design needs are fairly basic. Contribute 3 works with FTP, SecureFTP, local networks, or WebDAV in order to connect to your Web server and coordinate the distributed editing process.

EDITING PAGES in Contribute 3 is a snap. The toolbar offers several publishing and approval options.

Contribute 3's new workflow features are impressive. User roles with associated editorial privileges are a snap to set up. Granular locks ensure that only a user with edit rights for a Web asset can make changes, and only a user with publishing rights can sign off on a page sent for review. A shared assets repository refines management even further by allowing the administrator to manage Web pages, images, and Flash movies from a central location.

As in previous iterations, Contribute 3 can embed PowerPoint, Excel, and Word files into your workspace—a clear productivity boon and a standout feature. Contribute also continues to shine in its handling of printable documents. Building on the success of FlashPaper, a tool that lets site editors convert almost any document into a Flash file, FlashPaper 2 now supports links and searching. The result is a sexy, PDF-like interface for your new Web site asset.

We also appreciate the Help section, an oft-overlooked feature in software. Knowing the technical sophistication level of its readers, Contribute's documentation speaks in a simple and lucid manner.

Contribute 3 is aimed squarely at smaller operations; you won't find the kind of strict approval workflow or dynamic Web site management as you would in upmarket products like Interwoven or Vignette. But in an organization where site updates are frequent and the management chain is fairly straightforward, Contribute 3's solution is an excellent choice.

Contribute 3

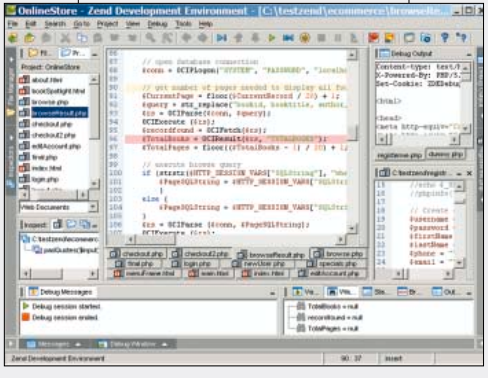
$149; upgrade, $79. Macromedia Inc., www.macromedia.com. ●●●●◐

PHP Makes Play for Prime Time

BY RICHARD V. DRAGAN

The lean and mean spirit of PHP—an open-source Web-scripting language—has led to its adoption on millions of domains. The new **Zend Studio 3.5** provides a capable developer environment with easy debugging and script profiling, plus support for the new PHP 5 version of the language. Although it's still a notch or two less powerful than comparable tools for Java or .NET, at just $249 (direct) this new release puts serious PHP development into reach for companies of all sizes.

PHP 5 beefs up the language's support for objects, including the ability to use language features familiar to C++/Java developers, like abstract classes, exception handling, and destructors. A major improvement is the ability to use references to objects, instead of introducing potential errors by copying objects. PHP 5 also adds support for XML (called SimpleXML) and SOAP for consuming and running Web services.



ZEND STUDIO 3.5 gives PHP developers a powerful IDE that's a good all-around performer.

Zend's IDE is packed with useful features. Source code syntax highlighting and slick, on-the-fly code completion for all installed PHP modules reduce coding chores. But development in Zend is still very much code-centered; don't look for visual editors, HTML designers, or wizards as with tools like Microsoft Visual Studio .NET, Borland JBuilder for Java, or Macromedia Dreamweaver. We also missed an integrated browser for viewing HTML output within the environment.

On the plus side, though, the IDE is nicely functional and ranks favorably next to any other tool on the market in general polish and ease of use. We tested very successfully with a set of scripts for a PHP-powered online B2C store, enhancing several screens and modifying database functionality with ease. The integrated debugger has all the features you'd expect in a contemporary dev tool, including breakpoints, pop-up and standard watch windows, and good control over stepping through code. Support for code analysis scans your code and suggests improvements. Enterprise developers will appreciate the support for integrated VCS, a must in a corporate setting. The ability to treat FTP servers as part of the file system within the IDE is another plus for faster real-world Web development.

Zend Studio 3.5

$249 direct (includes 1 year of updates and support). Zend Technologies Ltd., www.zend.com. ●●●●○

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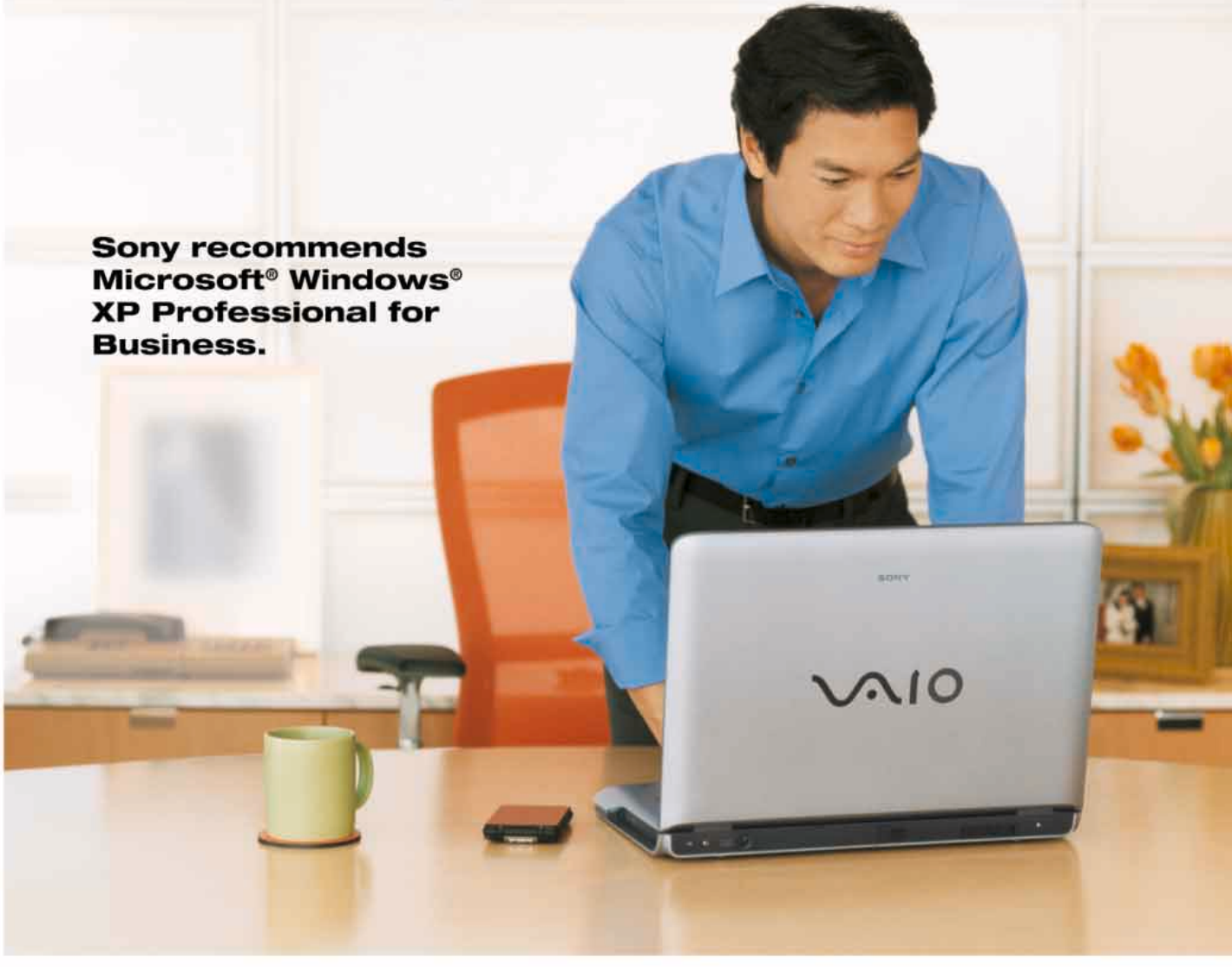

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FEEDBACK

> The "warez" scene affects not just companies like Microsoft; it also harms independent developers.

PLAYGROUNDS: HIS AND HERS

Bill Machrone's column (September 7, page 57) bemoaning the existence of a "man's room" is at odds with his many previous columns in which he described his wood shop, metal shop, and generally tech-infested basement, and in which he has never described his wife as being a partner. In a house in which there are rooms and a budget for these passions, there is no need for dual use for all spaces, and hopefully his wife also has her own spaces where she can have fun and find her own satisfaction. Even in the best marriages, each partner can (and should) have passions that do not need to be duplicated by the spouse. Machrone is off target in lamenting men who want a tech playground for themselves—he has his own such playground, and should rejoice in people of either sex who have found a fulfilling playground that can exist in the same house as the rest of the family. Cohesion is wonderful, space is essential, and both are vital in a family. Tech can be a part of anyone's space and still provide a function for the family—it need not be the same space for every family member to be a positive influence.

TAD MARSHALL

THE REALITY OF INFLAMMATORY COLUMNS

I would like to express my dismay at John Dvorak's article "The Myth of Disruptive Innovation." Mr. Dvorak's intent seems to be more to inflame than inform. A little research on Google reveals that Christensen's theories of disruptive innovation are a living body of research that is constantly being tested in real-world environments. In particular, Christensen's work came to prominence in part based on his successful consulting with Andy Grove at Intel, which led to the launch of the Celeron product line (see *www.forbes.com/forbes/1999/0125/6302088a.html* for more details). Many of Mr. Dvorak's comments about disruptions that "didn't replace anything" are answered in Christensen's latest work, *The Innovator's Solution* (2003; written in collaboration with Michael E. Raynor). Among other advances in the thinking, this book distinguishes between new-market and low-end disruptions (Mr. Dvorak's article makes reference only to *The Innovator's Dilemma*, published in 1997). Other important concepts introduced there suggest a more nuanced and useful theory of innovation than Mr. Dvorak seems to have time for. In summary, I love a good debunking as much as the next guy, but this article fails to meet *PC Magazine*'s standards for accurate and well-researched analysis.

MICHAEL PUTZ

SOFTWARE PIRACY HURTS SMALL DEVELOPERS

After a year of hard work during weekends, I finally managed to achieve a longtime dream: getting my software covered by such an established magazine as *PC Magazine* (June 8, page 122). However, my dream was shattered within a few days of being published. I was shocked to find my prized creation's serial number on a Web site (www.crackz.ws) after doing a Google search on the phrase "YazaaWeb iBrowser" to look at my app's progress.

I could think of no other way to fight these people than to contact your publication in an effort to create public awareness. The "warez" scene no longer affects only companies like Microsoft; it also harms independent developers who are trying to supply alternative solutions that may even be better than what's currently available. I am still speechless and stunned when I stumble across such a Web site. I cannot grasp how these organizations (and there are many) exist due to some minor legal technicality.

My software developing dream has ceased to exist. Whenever I open my development suite, I am reluctant to start coding due to the chilling fact of what happened. I can feel only sadness when I am confronted with the reality, which seems the destiny of many young developers like myself: failure.

PHILLIP C. DE BRUYN

STOP, THIEF!

I couldn't help feeling disgusted when Musicmatch's CEO Dennis Mudd all but endorsed what RealNetworks is doing with its Harmony software (Pipeline, September 21, page 23). One of the key reasons the iPod is so successful is because its MP4 AAC files can be played only on Apple-compatible devices, which the music industry loves. It's the ultimate form of copyright protection. The minute you give anybody the ability to break it, everything gets shot to hell. What RealNetworks is doing is no different from what the old Napster did, and we all know what happened to the latter. Harmony encourages theft, and it needs to be stopped.

REUBEN K. ABELLANA

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Corrections and Amplifications

■ In "Asterisk Foils VLOOKUP" (User to User, September 7, page 78), in the penultimate sentence, a formula was printed with two spurious spaces, after the first asterisk and after the second comma. The correct formula should read as follows: Replace A2 with SUBSTITUTE(A2,"*","~*").

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I can say without reservation that I have never received better support. Everything you did was timely and error-free. - Bob

I just wanted to tell you how pleased I am with the software, training, and speed. It was much easiier than I thought, and I could not be happier! Thanks! - David

I'm really impressed with the fast service you guys provide and the polite way you deal with what must seem very basic questions to you. Brilliant service! Thanks! - Sarah

I now have a few sites with you guys and believe me, I know the quality of your service, and it is a pleasure dealing with you. Your company is tops. Thanx again. - Dusty

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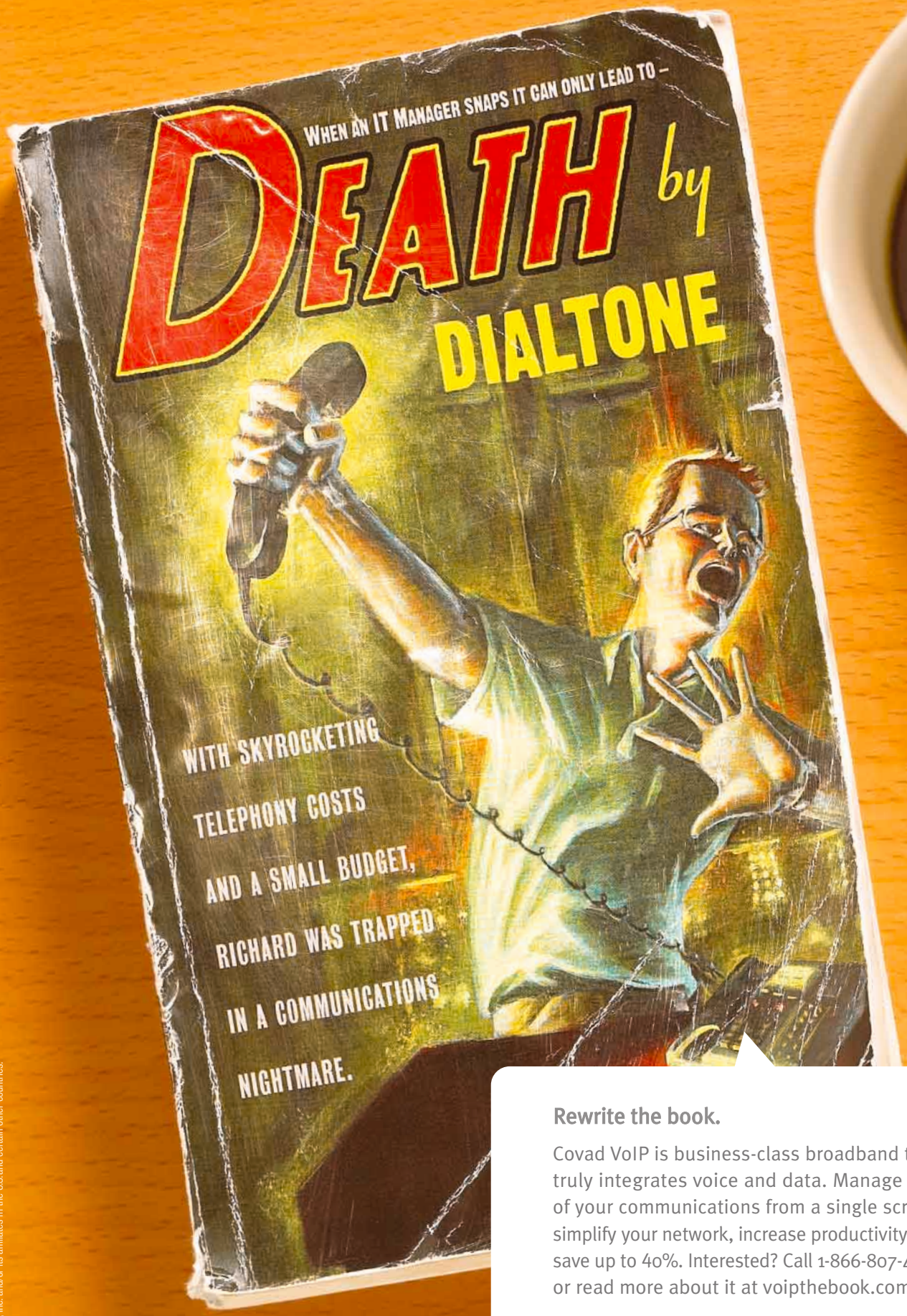

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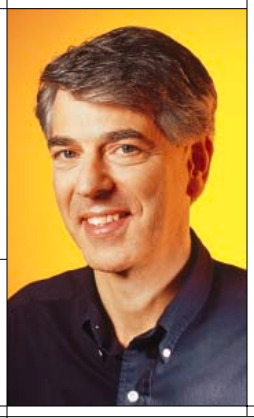
Bill Machrone



DVD Authoring and the Indomitable Spirit

Maybe it's just me, but every time I touch a DVD-burning program, something goes horribly wrong. Or nothing happens. Or a combination of the two occurs.

It all started when my son, Andrew, needed to reformat his laptop. He had a number of episodes of a defunct TV show on his hard drive and didn't want to lose them. I didn't have a DVD burner at the time, but I was reviewing Iomega's excellent little REV 35 removable hard drive backup device. We copied the contents of his drive to the 35GB cartridge and set it aside until we had the proper hardware and time to burn the episodes to DVD.

I then acquired a Micro Solutions Backpack drive, which has USB 2.0 I/O and writes all four major DVD formats. I also had accumulated a handful of DVD-R and -RW discs. In my usual mood of techno-optimism, I told my son, "Hey, instead of just burning the AVI files, why don't we use a DVD-editing package to put the shows into a format you can watch on TV? We can create a menu so you can select the episodes you want to watch."

He thought that was a great idea, and we started working on it one evening. I knew the DVD-RW discs would cause a minor inconvenience, because the player in our home theater rack was an older model that couldn't read them. But I had another player for testing that could read all formats. I plugged it into a spare set of inputs.

Never having tried to create a DVD chapter menu before, I was surprised to discover that many of the software packages couldn't do it. The SpeedyCD/DVD program that came with the Backpack couldn't, nor could Sonic MyDVD, another popular bundled program. I had used Ulead VideoStudio 8 successfully to create a slide show and thought I'd find success there. We found that three shows fit comfortably on the disc and that we could rearrange them on the timeline. The Create Chapters function correctly identified the beginning of each show as a chapter, and we checked the Create Menus box. The title screen, however, had only one entry on it—for the entire disc's contents. We couldn't make it create a menu entry for each chapter. But when we burned a -RW disc, we could fast-forward to each chapter with the buttons on the player.

That was good enough for archival purposes, so Andrew substituted a -R disc and attempted to reburn the project. No deal. It refused to write to the disc. We had to back up several steps in the creation process; then it burned the disc. Unlike with the -RW, however, we were unable to skip to the next chapter/episode.

We then decided to try some different software. Staying in the Ulead family, we downloaded the trial version of DVD Movie Factory, since it seemed more in line with what we wanted to do. We dragged three episodes to the timeline and were rewarded with a proper disc navigation menu with the opening scene from each show on it. We were able to edit the title of each menu entry and select any frame we wanted from the show as the menu scene.

Feeling courageous, I burned a DVD-R and popped it into the home theater player. The menu appeared on the TV, and the theme music we had chosen blared from the speakers. I pressed the Play button on the remote, but nothing happened. Undaunted, I went to the arrow keys to make a selection on the navigation window. There was no apparent response. But when I pressed Play again, I got gray video and couldn't get back to the navigation menu.

Figuring that my older DVD player just couldn't handle the disc, I popped it into the newer, plays-everything player, which proceeded to lock up hard. I cycled the power, but neglected to remove the disc from the drawer, whereupon it locked up again. When I retrieved the disc, only about a quarter of it appeared to have been burned, and the menu may have been the only thing on it.

That's where we stand right now—able to produce either multichapter menuless discs or engaging menus that don't do anything. We're seeking a compromise. Among the packages we are considering for the next round are Roxio Easy Media Creator 7, Ulead DVD Workshop 2, and Pinnacle Studio 8.

My glow of techno-optimism has become a discouraging fog, as I contemplate endless days of loading DVD-authoring packages onto my computer, importing the content, waiting for it to render, and burning the discs, only to find some new, weird wrinkle. But my faith in technology is strong. I know that somewhere, someone is successfully burning DVDs with menus. It gives me hope.

My faith in technology is strong. I know that somewhere, someone is successfully burning DVDs with menus.

MORE ON THE WEB: *You can contact Bill Machrone at* Bill_Machrone@ziffdavis.com. *For more Extreme Tech columns, go to* **www.pcmag.com/machrone.**

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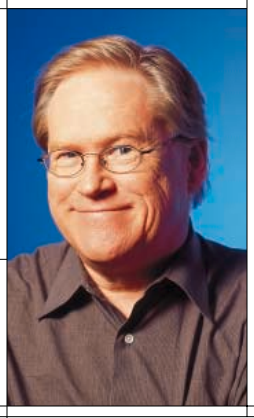
John C. Dvorak



False Promises, Failed Initiatives

Five years ago, all the research suggested that by now DSL would be the dominant broadband technology, easily passing cable and other competitors. There were also a number of high-speed DSL initiatives—various VDSL and XDSL specifications—that would deliver 10 Mbps or more to the home. What happened?

It's hard to say why DSL has ended up being less than exciting, in both its debut and its lack of improvements. In fact my early DSL provider, Northpoint Communications (now bankrupt), provided me with a faster connection in 1999 than I get today. Unless I hook up a cable modem, of course. Oh, wait. I still can't get cable, despite years of promises to the contrary.

I specifically recall being told that I could get cable modem access in my area in 2000. As we head to 2005, there's still nothing. My only alternative is a pricey DSL connection. In many parts of the country, they actually sell 128- and 256-Kbps DSL and call it broadband.

The situation gets worse. Some years back, Sprint rolled out its Sprint Broadband Connect, a system that works with point-to-point dishes, delivering varying speeds throughout the day. A couple of years ago, Sprint stopped selling it, though it kept the old service running on a maintenance basis. Why? It seemed to work. Well, the company didn't like the point-to-point, line-of-sight approach. A couple of different companies with a better wireless broadcast method popped up, and Sprint said it would implement that and phase out the line-of-sight architecture. Years go by, and still nothing. What happened?

You really begin to miss the aggressive technology rollout of the nineties. There is nothing going on anymore.

But let's forget this gem. Remember those dozens of companies producing equipment to make a "grid" or a "mesh"? This has been going on for close to a decade, from what I can tell. I even recall the little rooftop transceivers that Nokia invented. You put these on the roof and entire cities could be lit up with connectivity. Yeah, right. There were proposals to put these devices on telephone poles too.

And here's another dead end. Around 1998, I attended a networking confab in Monaco and saw all this data about how the world had changed because of wave-division multiplexing on fiber, and how by 2004 we should have WAN connectivity speeds greater than LAN speeds. Because of this structural change, LANs would go away and we'd all be on one big, happy, super high-speed WAN. A look at the crossover points on these charts made this seem as plain as day! Hmm.

The only thing that has developed since 1999 is 802.11b/g, which was not intended to be the answer to anything except light LAN use. My ISP was down recently, and I had to get an e-mail. I grabbed my notebook with its built-in 802.11b wireless and fired it up. It logged on to some nearby default Wi-Fi hub, and I jumped on the Net, got into my IMAP mailbox, and got the message. Great, I have to poach a connection from a neighbor, because the network providers can't keep the network running right.

The worst aspect of this is that it's not impossible to give the public universal high-speed connectivity. Korea has it. I remember going to an event in 1993 in Korea and staying out in Taejon near Korea's World's Fair. It was like pulling teeth to get online. I eventually had to cheat the connection with one of the acoustic couplers I used to carry around when traveling. Within a decade, the Koreans went from that misery to 75 percent broadband penetration—all at high speeds. And we've done what in the USA? DSL at 256 Kbps and call it broadband?

And of course, we can't forget fiber-optic cable to the home. The people who provide fiber to the home have pretty well decided that fiber may go into a few new subdivisions but will not be retrofitted into anything anytime soon. There is also the initiative to put in direct Ethernet to the home. Forget phone signaling. Just go with Ethernet. I've heard about this for years. Apparently most of these ideas are ways of inducing investment bankers to part with some money and nothing more.

It's been one disappointment after another. The list is endless. I don't even have space in this column to go into the problems with the services that were promised to come with broadband, such as video on demand and phone service. Where are all the phones that are supposed to run through the cable modem lash-up? I've heard of one or two, but have seen zero. Much of this has to do with corrupt politics creating roadblocks to progress. Pathetic.

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.

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Inside Track

Suspicious Battle Dept.: The Blu-ray disc standard continues to battle with the HD-DVD standards in the **back alleys** of Asia. The final spec for HD-DVD should appear early next year. Though the Blu-ray group has a final standard, they are now adding to it. This process of creating constant additional standards within standards **makes a mockery** of the concept of standards.

This problem is rampant in the current crop of DVD players—in case you haven't noticed. These incorporate different sound standards and playback schemes, and some DVD players can read writable discs while others cannot. It's amazing that these things manage to work at all. Most work poorly. The latest twist with Blu-ray is that it has now incorporated **Microsoft's VC-1 video codec.** There is some scheme afoot here. I sense that all of this will unfold slower than anyone wants to imagine. The blank media itself is part of the problem for both systems, too.

The hope is that everyone with a DVD collection will **have to replace** it with HD or Blu-ray discs. You know, kind of the way we all had to replace our vinyl records with CDs. I am not sure that everyone will want to do this. Unlike with vinyl, there is some hope that a new HD player will also play the older discs. Samsung already has a DVD player that **up-converts** the image to 720 pixels, although it will only send that signal out of a DVI port because of Hollywood restrictions.

Anyway, here is **the status** of the new battle and what you need to know about it at this point. Blu-ray, already standardized (sort of), is already shipping (too expensive: players $2,700, discs at $68), supported by HP, Panasonic, Pioneer, Sony, and others. Blu-ray discs contain 50GB **of dual-layer data** and can hold 4.5 hours of HD video or up to 63 hours of analog video.

Meanwhile, HD-DVD seems like a long shot, with backing by NEC, Toshiba, and the DVD Forum, which seems peculiar. HD-DVD's claim to fame is that it is easier to use old gear to make the discs. The discs' capacity is only 30GB, and the rest of the specs are still up in the air, it would seem. The only thing that gives this standard an edge is its backward disc-making compatibility. Given its late start and its odd partners, I cannot see how HD-DVD will be able to win this battle. That's unless, for some reason, **China decides to adopt it.** China is always looking for the cheaper solution, without regard to the rest of the world. China, as you'll recall, was heavily into the VCD market when few others cared about it, so there may be more to this battle than meets the eye.

The consumer electronics companies in Japan hate it when China goes completely on its own. If they can lock down the patents and licenses for this alternate technology, it might be **impossible or fruitless** for anyone to try to develop a third methodology for HD recording. This seems to be the only explanation for the fact that the DVD Forum approved the HD-DVD initiative in the first place. All of the members of the Blu-ray group **are also in the DVD Forum,** after all.

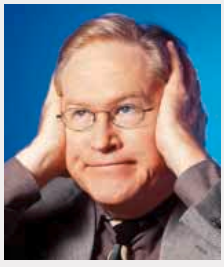
If the **Chinese can be kept busy** cranking out discs (real and bootleg) in a format not used by the U.S. and Europe, then Hollywood will be happy as a clam. Makes sense to me.

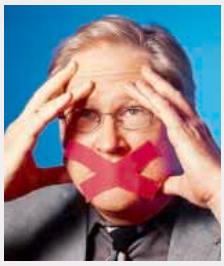
Creating a Monster Dept.: While on the subject of **piracy,** remember that Norwegian kid, Jon Lech Johansen, who busted the uncrackable CSS encryption in his **spare time?** He was then hounded by the authorities over what should have been seen as an invention. He now has a blog up at *www.nanocrew.net/blog/*, where you discover that he has been **churning out** all sorts of cracks and following the scene so closely that you have to wonder exactly why the RIAA or the MPAA or some IP company didn't hire him years ago to help them protect their schemes.

I am not saying that hackers should be developing exploits in order to find a job, but coders who obviously think differently than the rest of us are **incredibly rare.** I'm certain that if someone dropped a million-dollar check in Johansen's lap, he would quickly jump ship. Instead, tens of millions have been spent fighting against him and his comrades. And most of those hackers are judgment-proof, because they have no money. It's both pointless and baffling.

Amusing Aside Dept.: On the Microsoft developers' Web site, the company has made the rationale for the development of a new file system called WinFS fairly clear: *Storage today can have almost unlimited capacity, but users still have outdated methods for organizing and accessing hundreds or thousands of files. It is simply too hard for users to organize and find data that is spread across multiple drives, network shares, and other storage media. To improve the storage experience, that data needs to be complemented by useful metadata that users can find, relate, and act upon. "WinFS" is designed to answer that need.*

You immediately see that the company is in some other dimension when it even **suggests** that users are having trouble finding data among **"hundreds" of files.** Huh? Even "thousands" hardly touches the surface. Tens of thousands is more like it. Get with it, boys!





Microsoft is in some other dimension when it suggests that users are having trouble finding data among "hundreds" of files.

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Bill Howard

Rent, Don't Rip

It's time for a change. I'm ready to rent, not own. After years collecting hundreds of vinyl LPs, CDs, and DVDs—and a couple hundred hours ripping, reripping, transferring, and backing up—I'm not sure it's worth the hassle. Not when you can tithe Apple, CinemaNow, Microsoft, and Napster a few dollars every month and have all the entertainment you want.

For someone who's always thought it better to own a house than rent a condo, to buy a car outright than make lease payments for the rest of your life, this is a big change. Maybe you should think about it too. The cost of ownership includes the cost of the CD and DVD discs, replacements for the ones you break or lose, plus the time frittered away dealing with lookups, listings, backups, and transcoding.

When music-ripping software came of age circa 2000, the first thing I did was rip all my CDs as MP3 files to my hard drive at 128 Kbps, and it was a tight fit. And then I made archival duplicate CDs so I could use them in the car without risking the originals. And then I ripped the originals again a couple years later when Microsoft told me WMA at 64 Kbps was as good as MP3 as 128 Kbps. (Hah!) Then I moved up to 192 Kbps and tried ripping with both WMA and MP3.

Then I realized hard drives are so cheap; why scrimp? And I started reripping with a lossless codec; every CD I own fits, lossless, on a $75 hard drive. Plus there were the endless hassles of finding and sharing album art between Musicmatch Jukebox and Windows Media Player. I slightly prefer the Windows interface over Musicmatch. But Microsoft's CD lookup engine makes Olympic gymnastics judges look adept, so I still use Musicmatch too. At PC *Magazine,* we can almost convince ourselves that we're transcoding and ID3 tagging in the name of research—not wasting time.

The more CDs and DVDs you own, the more you realize how much entertainment you're missing. That's reinforced if you have 120 channels of Sirius or XM Satellite Radio in your car, a Napster or Rhapsody music stream at home, or even the digital music channels on cable and satellite TV. For $10 a month, you can have all the music you want at moderate fidelity (few of us stop to listen to music critically). And for another $5 a month, you can stream as much of it as you want to a portable music player. If you buy 100 CDs, you'll spend $1,500. The same investment applied to renting your tunes could carry you and your music player through the next decade. And you wouldn't be stuck with a physical copy of *Brother Sun, Sister Moon* unto eternity.

When you lease access to entertainment, you're eventually also getting the best and newest technology. CDs haven't changed in their 25 years, but it's possible they'll be supplanted by something like SACD or DVD Audio. If you're unsure of the difference between regular stereo, contrived surround sound, and true 5.1 audio, go sit in the front seat of a new Acura RL or Cadillac STS. Similarly, my DVD collection is about to become obsolete in the face of high-definition DVD, and I don't hear Miramax offering to give me an HD version of *Top Gun* if I turn in the old one and pay only shipping and handling. Maybe I should be investing in movie downloads or pay-per-view.

With music, you could switch over right now. Broadband pipes are fast enough to stream live music or to fill any size hard drive inside of a day, and then you can have licensed copies for your portable player and your car (PhatNoise and Omnifi make car hard-drive players). Ten dollars for a month of music sounds fine; $5 for a 24-hour movie rental download seems a bit pricey. And video downloads can be slow. But I would pay Movielink $5 or $10 in exchange for 5 hours of preteen entertainment for our backseat system; in fact, I'd be willing to do a blind-as-a-Priceline-bid kind of deal and get a surprise assortment if it would cost less.

There's no guarantee that a month of music will always be $10, plus $5 a month for sharing with a portable device. In fact, you know Hollywood and the music industry are trying to figure out the threshold of pain. Walt Disney World and the airlines already do it, and they have a nice name for it: yield management.

Don't toss your DVD player just yet. But do give serious thought to whether you should rent or own your music in the future. The wave of technology arriving this fall with the next generation of Microsoft Windows XP Media Center Edition PCs and linked digital media hubs, called Media Center Extenders (if they're Media Center-specific), will make rental even more tempting.

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.**

If you buy 100 CDs, you'll spend $1,500. The same investment would carry you and your music player through the next decade.

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Hack Your Gadgets

You don't need to accept your high-tech toys as they are. Tricks abound for making them do more. **BY BILL MACHRONE**

How many times have you seen a product and thought, "Great, but if only it could..."? Or perhaps you recognized its potential as a platform for an entirely different application. That's the basis for hacking gadgets—improving them, giving them new features, tailoring them to your specific needs, or defeating built-in limitations. Here's our survey of some of the more interesting consumer electronics hacks. Be forewarned, though: Hacking a product may cause irreversible damage and will almost certainly void the warranty.

REBEL, REBEL

You've just spent the better part of $1,000 on a digital single-lens-reflex camera, so what's the first thing you do? Hack the firmware. The Canon EOS Digital Rebel shares much of its firmware with the higher-end EOS 10D. This was first discovered by an enterprising Russian hacker known as Wasia, who figured out how to turn on the inactive portion of the firmware, expanding the camera's capabilities. He's now releasing his own version of the firmware and updating it as he figures out how to get the Digital Rebel to do even more.

The hacked firmware lets you turn on flash exposure compensation, adjust the shutter and aperture, control bracketing, boost the ISO, and much more. You update your camera via a CompactFlash card after you've downloaded the code onto it from your PC. The update is reversible. Several sites document the firmware hack, but this one has other useful tips, too: *www.bahneman/com/liem/photos/tricks/digital-rebel-tricks.html* .

GET AROUND DVD PLAYER LIMITS

We don't have enough pages in this magazine to list every DVD player hack, but most of them focus on defeating region/country codes or changing the codes. Other hacks add the ability to play unsupported file or disc types. Though the media companies want their content to be as restricted as possible, DVD player manufacturers seem to be adhering more to the letter than to the spirit of the law, by making their players as flexible as possible while technically complying with the international agreements. Thus, the undocumented features are hidden away under layers of error messages, button presses, and weird on-screen messages.

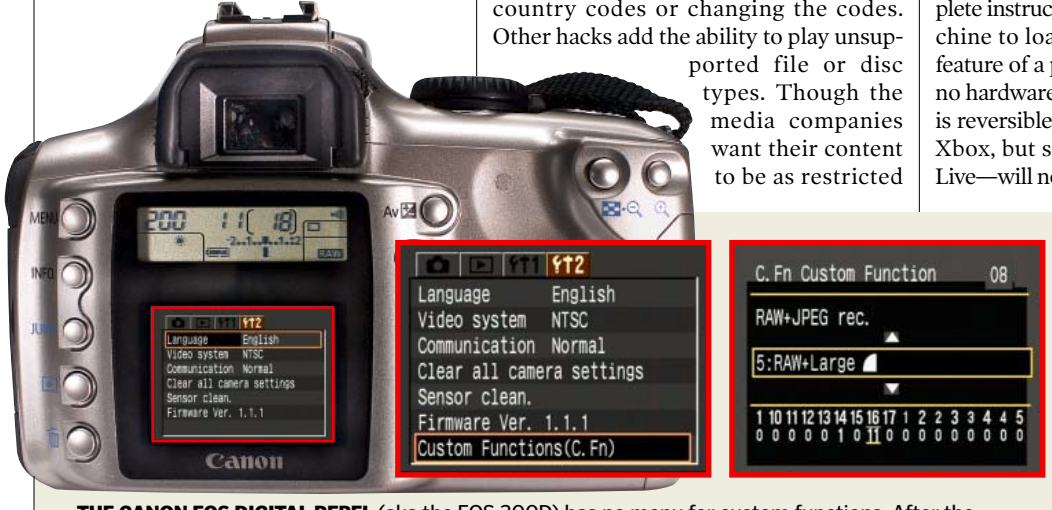
The definitive source for DVD hacks is *www.videohelp.com/dvdhacks*, but you can find more by searching various message boards for your machine's model number.

MICROSOFT XBOX + HACK = LINUX WORKSTATION

There's a powerful graphics workstation inside every Microsoft Xbox. Hackers, especially Linux fans, would love to run a general-purpose operating system on the Xbox and use it as an inexpensive graphics computer, so Microsoft designed it to be highly hack-resistant. Microsoft probably loses money on every console it sells, with the intent of making it up on the games. The Xbox hardware and software check one another during boot-up and execution to make sure that everything is present and accounted for and that no foreign hardware is detected.

The state of the art in Xbox hacks is at *www.xbox-linux.org* , which provides complete instructions on how to modify the machine to load Linux, using the *savegame* feature of a popular game and a USB key—no hardware hacking is required. The mod is reversible, so you're not sacrificing your Xbox, but some features—such as Xbox Live—will not work while the mod is active.

The various Xbox Linux projects are a testament to the cleverness and determination of programmers and are also prima facie evidence that nothing is hackproof. But the Xbox, with its 733-MHz Celeron CPU and 10GB hard drive, is looking somewhat dated, even for $150. As the power of sub-$500 PCs continues to climb, the Xbox is a less and less inviting target.



THE CANON EOS DIGITAL REBEL (aka the EOS 300D) has no menu for custom functions. After the firmware hack, which activates features that the Digital Rebel shares with the higher-end EOS 10D but which are normally disabled, the menu appears. Among the features this hack makes available is the ability to save the same image in both RAW and JPEG formats in a variety of sizes.

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GAMERS CAN PLAY Unreal Tournament and other favorites on widescreen TVs at HDTV resolutions, thanks to software hacks.

REFILL INK JET CARTRIDGES

Ink jet printers have been based on a razors-and-blades model since long before the Xbox, with replacement ink cartridges costing a hefty percentage of the printer's price. Despite dire warnings from the manufacturers, cartridge refilling kits are big business, and many users report success and savings in refilling their cartridges.

In an effort to dissuade refillers, many Epson and Hewlett-Packard printers keep track of electronically readable cartridge serial numbers. So if you refill and replace a cartridge, the printer rejects it.

Several Epson cartridges store data in a small memory chip on the cartridge. Eddie's Ink Chip Hack (*www.eddiem.com/photo/printer/chipreset/resetchip.html*) uses a homebuilt dongle from the printer port to reset the cartridge chip. Even if you never intend to refill a cartridge, it's an engaging story of using hardware and software to solve a problem. Commercial Epson cartridge resetters are now available from refill suppliers.

On many HP printers, the printer remembers the last two cartridges, so if you keep three or more old empties around, you can refill them sequentially or use the empties to force the serial number of the one you've refilled out of the printer's memory. You can also mask a couple of the contacts on the cartridge with tape to spoof the serial number, but be sure not to leave any tape residue on the contacts. You can get details on HP cartridge hacks, plus far more than you ever wanted to know about the technology, politics, and economics of HP printers, at *www.searchlores.org/realicra/hp_slobo.htm*.

A ROBOT IN EVERY ROOMBA

Why would anyone want to hack a vacuum cleaner? Because it's a robotics platform. If you're into the software side of robotics, a Roomba will give you the hardware platform—motors, wheels, sensors, battery, and charger that you would otherwise have to obtain elsewhere, a process that would be an expensive and time-consuming obstacle to your project. The Roomba isn't rugged enough for a BattleBot, but it's perfect for experimentation.

One approach is to do brain surgery on the unit, replacing its microcontroller with a popular, easy-to-program controller such as the Basic Stamp. The Zoomba was an early attempt at such a device, but it never made it past the prototype stage. Another effort, dubbed RoombaBT, has as its goal a Bluetooth-enabled Roomba, so you can direct your vacuum wirelessly, even from your cell phone. You can stay up-to-date on various Roomba hacks at *www.roombacommunity.com* and get step-by-step disassembly instructions at *www.tla.org/roomba/*.

PHILLIP TORRONE fitted a Roomba with a tablet PC and Webcam to create a mobile camera platform (*www.flashenabled.com*).

KILLER HDTV GAMING

If you're fortunate enough to have a PC that can output to a widescreen TV, and you're an avid gamer, you're in luck. An increasing number of games can be played in HDTV resolutions without ugly stretching or distortion. All those extra pixels can slow down some of the most graphics-intensive games, but you needed a reason to upgrade to an even faster machine, right?

TigerDave (*www.tigerdave.com*) maintains a list of games and links to the software hacks you'll need to force them into these nonstandard modes. Much of the information comes from the home-theater gaming group at the AV Science Forum (*www.avscience.com*), but it's nicely distilled here and confirmed by TigerDave. The games vary widely in the amount of effort you have to expend. Odd behaviors, such as disappearing cursors and the like, are to be expected, but the rewards are phenomenal when everything works right.

TIVO TO THE MAX

TiVo hacks are so popular that at last count, we found three books on the topic, as well as numerous Web sites, and they cover both series 1 and series 2 TiVos. The hacks run the gamut from simple access to the internal Linux operating system to backdoor codes that call forth a variety of undocumented features, including enabling a 30-second skip. Some of these "features" can also turn your TiVo into a doorstop, so proceed with the utmost caution and read everything before you do anything. *www.tivocommunity.com* is a good place to start, as is the *www.tivohelp.com* knowledge base.

You'll find freeware TiVo screensavers, utility programs that run on the TiVo OS, and some guides to hacking TiVo hardware. You can even install an FTP server on your box and transfer files over your LAN with it. The amount of effort people have expended on their TiVos is impressive; it's a wonder that they have any time left to actually watch TV.

HARDWARE

Harnessing Histograms

These little charts can help ensure that your digital photos are properly exposed. **BY DAVID CARDINAL**

A search in *pcmag.com* for the word *histogram* reveals that dozens of cameras have this feature, and occasionally a review notes its disappointing absence. You may have seen these references or come across the histogram on your camera, and wondered what the heck a histogram is and why you should care.

Histograms are not widely understood, but taking a few moments to learn about them can improve your photography significantly. Histograms can show you clearly and immediately whether your images are overexposed, underexposed, or just right, and help you to make any necessary changes in order to compensate when reshooting the scene.

A histogram is simply a chart that shows how many of the pixels in an image have each level of luminosity (brightness) from black (0) to white (255). The portion of the histogram that is to the left shows how much of your image is dark (black or nearly black), while the part to the right shows the amount of the image that is light (white or nearly white).

If the curve of the histogram appears pushed to the left, your image is mostly dark, and if it is pushed to the right, then, likewise, it is mostly light. It is important to realize that this doesn't automatically mean that the photo is under- or overexposed. You need to decide if this is the way that you wanted to capture the scene. If you are looking at a bright scene, it would probably make sense for the histogram to be pushed toward the right, but if it is meant to be a dark and moody scene, then the same histogram would indicate that it is overexposed. You could then adjust your camera's settings in order to compensate.

One very important thing to watch for is whether the histogram has a spike all the way against the far left or far right edge. Such a histogram shows that you have a lot of pixels that are pure black or pure white with no detail. Unless you really want large areas of pure white or black, it means that your image is over- or underexposed. If your histogram has a nice smooth hump in the middle, then the image is in the midtone range and your camera should have little trouble in capturing it.

It's almost that simple. The only other key is to realize that if your image is supposed to look dark, you will want the histogram to be more toward the left, and if the image is supposed to look bright, then you will want the histogram more to the right.

FIGURE 1: In the original shot of the puffin, the bird's white belly is overexposed; the histogram confirms this with the curve at the right of the chart.

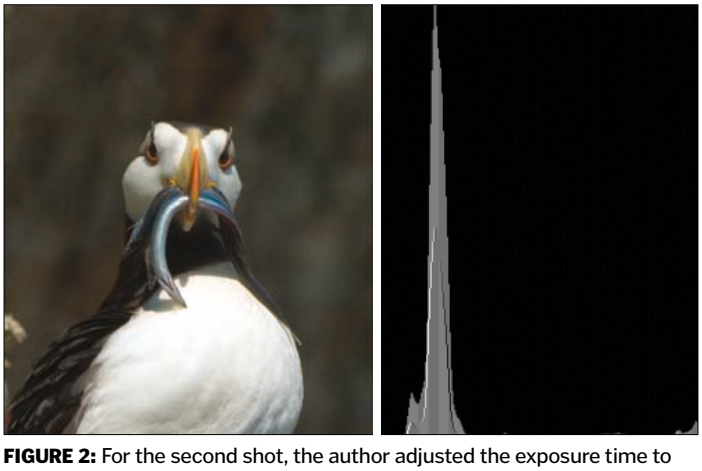

FIGURE 2: For the second shot, the author adjusted the exposure time to preserve detail; this is reflected in the more even histogram.

The accompanying images of a puffin show how I was able to use the histogram to correct my camera's metering of a tricky scene. The first image shows the puffin as the camera metered it. Because the histogram is pushed up against the right edge, I could tell that I had lost all of the detail in the white feathers, and that they would print as a featureless white blotch. To correct this in reshooting the scene, I dialed in minus 1.5 stops of exposure compensation, which increased the camera's shutter speed (allowing in less light) while leaving the aperture unchanged. The result was the more even histogram that you see in the second image.

If your camera offers a histogram, you will have to read your manual to find out how to bring it up, since the method varies. Many cameras even offer real-time histograms in order to let you preview the exposure on the LCD *before* you take your picture. Most image editing software programs such as Photoshop also offer histograms that you can use to adjust exposure after the fact, but it's always best to get the image right when you take your photograph.

Far from being the puzzling, even threatening, mathematical charts they may seem to be at first glance, histograms offer a quick assessment of the light balance of your digital photos. You should be able to apply this knowledge easily to adjusting your settings and improving your photos.

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1&1 WebStatistics	✓	✓
In2site Live Dialogue	✓	✓
1&1 Newsletter Tool	✓	✓
1&1 WebElements	✓	✓
SITE-BUILDING TOOLS		
WebsiteCreator	18 pages	18 pages
Software bundle worth $600	✓	✓
FrontPage extensions	✓	✓
CGI library	✓	✓
Active Server Pages	–	✓
ASP.NET, .NET Framework	–	✓
Perl, PHP3 and PHP4	✓	–
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POP3 accounts	150	150
Aliases, auto-responders, forwarding	✓	✓
1&1 WebMail	✓	✓
Symantec Virus Scanners	3 accounts	3 accounts
SECURITY FEATURES		
Protected by up-to-date firewall	✓	✓
Daily backups	✓	✓
Password protected directories	✓	✓
SSH Secure Shell Access	✓	–
Dedicated SSL Certificate	optional	optional
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1&1 WebStatistics	✓	✓
In2site Live Dialogue	✓	✓
1&1 Newsletter Tool	✓	✓
1&1 WebElements	✓	✓
SITE-BUILDING TOOLS		
WebsiteCreator	25 pages	25 pages
Software bundle worth $600	✓	✓
FrontPage extensions	✓	✓
CGI library	✓	✓
Active Server Pages	–	✓
ASP.NET, .NET Framework	–	✓
Perl, PHP3 and PHP4	✓	–
1&1 WebDatabase	✓	✓
Database	3 MySQL	MS Access, MS SQL
Cron Jobs	✓	–
SSI (Server side includes)	✓	✓
Advanced Developer Tools	✓	–
DOMAIN NAMES		
Included Domains	5	5
Subdomains	200	200
Run multiple independant sites	✓	✓
Full DNS management	✓	✓
E-MAIL		
POP3 accounts	300	300
Aliases, auto-responders, forwarding	✓	✓
1&1 WebMail	✓	✓
Symantec Virus Scanners	6 accounts	6 accounts
SECURITY FEATURES		
Protected by up-to-date firewall	✓	✓
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SECURITY WATCH

Security Center Spoof

Has Windows' new security control panel created a new target for attackers? BY JAY MUNRO AND NEIL J. RUBENKING

Windows XP Service Pack 2, released to the public in August, raises the operating system's security bar. But enthusiasm for the first big Windows update in two years is tempered by discoveries of new holes.

Through an anonymous tip, we have confirmed a spoofing vulnerability in the Windows Security Center, the new control panel for a PC's security status, which could let compromised security settings go undetected. A likely use of the exploit would cause the Security Center to report false information about system security, such as that all was well while the computer was really under attack. It could also be used to let a malicious program watch for a chance to do damage without being detected.

THE SECURITY CENTER shows the status of your main defenses. If your firewall has been disabled or your antivirus is out of date, the news will display here. We were able to use a script to add fake antivirus and firewall product listings in the Windows Security Center. Then we told WMI that they were up-to-date and enabled.

Windows stores security status in a database managed by the Windows Management Instrumentation (WMI) subsystem, Microsoft's implementation of Web-Based Enterprise Management (WBEM), an industry standard for accessing management information. Microsoft added new fields in SP2 to hold the firewall and antivirus data. The WMI database is accessible via the WBEM API (application program interface) and is available to any program that wants to access it, including local applications written in desktop- or Web-based scripting tools, or ActiveX modules.

We found that the WMI database is vulnerable to spoofing because it doesn't authenticate programs reading or writing information to it. Malware could report the AV and firewall enabled and up-to-date, when in fact they aren't. Under the cloak of apparent security, the attacker could do his dirty work. We're reminded of the video feed trick that the bandits used to fool casino management in the 2001 remake of "Ocean's Eleven."

Direct attacks on a properly enabled antivirus or firewall are almost always blocked, but a malicious program could wait until the apps are temporarily disabled. Prior to SP2, malware would have had to monitor the apps directly, which would trigger alarms, but a program casually checking WMI might be ignored. When WMI reports that protection is off, this program could permanently disable the security apps and stay undetected. It could change their status to "up-to-date" and "enabled," regardless of the true status. The WMI could also be used to create listings for bogus security products.

The WMI and WBEM interface have been well documented both on the Microsoft Developer's Network and elsewhere online. We found references to the namespace and objects that the Windows Security Center uses, though none to it being exploited, yet.

While documentation for the Security Center and WMI API was shown only to security companies, Windows itself contains a utility, Wbemtest.exe, that lets you view, add, and edit the values in the WMI. Files associated with the utility provide the namespace and data types associated with the Security Center in plain text. With this information, a malicious developer could easily spoof the WSC.

A small comfort is that to change the WMI and spoof the Security Center, the user must be running Windows in Administrator mode. If executed in XP's Limited Mode, Windows will not allow changes. Unfortunately, Windows XP runs in Administrator mode by default, and many users never change this setting.

Microsoft disagreed with our assessment of the problem as a hole (*http://www.pcmag.com/article2/0,1759,1639277,00.asp*), noting that system-level access to a PC would be needed for the spoofing, and adding "If the user downloads and runs an application that would allow for spoofing of Windows Security Center, they have already opened the door for hackers to do what they want."

Alas, this is similar to Microsoft's stance on the Windows Firewall, which provides only inbound protection. But it's too easy for users to fall prey to social engineering and other tricks and let malware onto their systems for this to be sufficient. That's why we've maintained that you need a strong bidirectional firewall, such as Norton Personal Firewall or ZoneAlarm, and why we feel that Microsoft must do more to protect the Security Center.

Despite the spoofing vulnerability, we recommend SP2 for its overall enhancements to system safety. But to be sure that all is well, launch your AV and firewall software now and then, and make sure that they also report that they're enabled and up-to-date.

THE LOOKOUT

NOT QUITE BLIND

The BCC (blind carbon copy) field in an e-mail lets you send a message without revealing the entire mailing list to each recipient. However, Microsoft recently posted a knowledge base article (#843555) that reports an Outlook Express 6 condition where the BCC list can be viewed. If the user configures Outlook Explorer to use the *Break apart messages larger than* selection in the *Properties* dialog box, recipients can view the BCC by saving the message and viewing in Notepad. A hotfix is available and will be updated in the next Internet Explorer 6 service pack.—*Jay Munro*

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ENTERPRISE

The View from Above

To visit one of AMB Property's buildings around the globe, let a PC fly you there. **BY SEBASTIAN RUPLEY**

When it comes to scouting new sites for operations and investments, some businesses are taking to the air—virtually, that is. Keyhole Inc. Images is a private Silicon Valley–based application service provider that has attracted more than 1,300 enterprises that depend on the company's high-resolution aerial-photography hosting and data-delivery services to make business decisions. The company is a pioneer in the growing field of *location-based intelligence,* and AMB Property Corp. is using Keyhole's technology for research and presentations across several of its divisions.

Many kinds of organizations, from real-estate firms to insurance companies, rely on location-based intelligence to evaluate risks and advantages. AMB Property owns over 1,000 buildings and approximately 100 million square feet of industrial properties globally, primarily in the U.S., Mexico, Europe, and Asia. The company uses Keyhole 2 PRO software, which includes a movie-making module, to build virtual aerial flybys of properties it owns and locations it may invest in.

Keyhole hosts over 12 terabytes—slated to jump to 20TB by the end of this year—of aerial imagery from all over the globe. It stitches together its database from numerous aerial-photo providers and from satellite imagery. AMB users employ Keyhole's client software to tap into the aerial-imagery database and construct both still-photo and movie presentations showing AMB's buildings and their surroundings. The company also uses Keyhole's imagery to investigate and demonstrate the proximity of major business hubs, highways, seaports, airports, and other nearby landmarks. Many of AMB's buildings are warehouses and distribution centers, so it's critically important to show investors that they are near major modes of transportation.

"We use the software so that we can show a close-up illustrating that the building is well built and functional, but you can also pull back to get a larger sense of where it's located," says Wayne R. Pryor, AMB Property's CTO. In one movie, the viewer virtually flies over Los Angeles before focusing in on a view of LAX airport and its surroundings; then AMB's nearby buildings begin to appear, with the company's logo layered on their tops. Pryor adds that AMB's research director uses the technology extensively to evaluate areas for new investments.

"We can start researching by putting in an address on the left of the screen, and then there are locations [such as airports and landmarks] that are already defined so you can begin to drill down on an area," explains Pryor.

One of the services AMB uses is Keyhole's hosting of named, saved versions of flybys so that they can be called up later. Keyhole also securely hosts its customers' own data for use in conjunction with the imagery. For AMB, Keyhole hosts various kinds of financial data related to AMB's buildings, so that users can pull up that information and learn more about the property they're looking at.

That kind of association between data and imagery is a key part of Keyhole's software strategy; its location-based research includes much more than pictures. The company tracks more than six million businesses, so a user at AMB can turn on software layers showing where all Wal-Marts or Burger Kings near its buildings are, and search for businesses by name. Or a user can layer a comprehensive road network on aerial imagery depicting AMB's buildings. Keyhole offers a seven-day trial of its software at *www.keyhole.com;* type your home address into the client software and you'll be able to see what it looks like from up above.

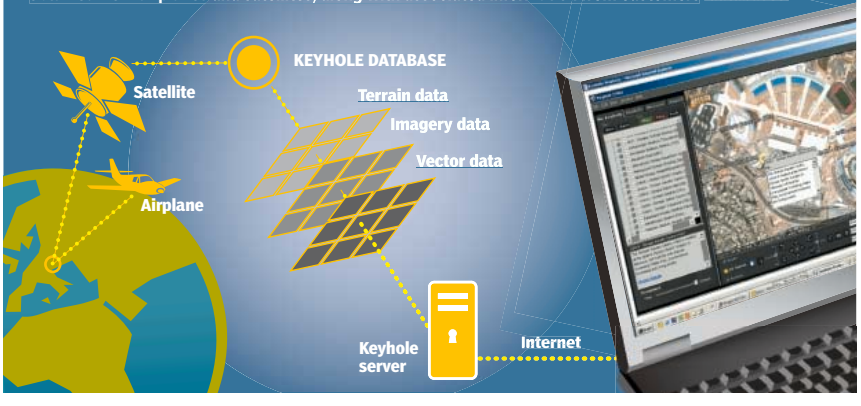
Some global areas are harder to depict completely than others. "International [photography] presents some problems, but satellite is the way to get that data," says John Hanke, Keyhole's CEO. "It can collect Baghdad as easily as it can collect Denver." Much of the aerial photography of Iraq that has been shown on television, especially on CNN, was collected using Keyhole's services.

"We have high-resolution imagery for all the markets we're in in the U.S. and Mexico, and for most of the markets we're in in Europe," says AMB's Pryor. "We're moving into Shanghai, China, and the imagery there is getting better."

AMB licenses Keyhole 2 PRO; though costs for the technology vary according to the number of users, a standard per-user, per-year license is $599. "We initially started using Keyhole as part of our marketing effort," says Pryor, "but we're expanding it out to people at the company involved in many business disciplines." For many people at AMB, virtual flying is as common a software application as any other.

The Sky's No Limit

For virtual flybys, end users at AMB Property use Keyhole Pro client software and Internet connections to access Keyhole's servers. The Keyhole servers host terabytes of data from multiple imagery sources, obtained from airplanes and satellites, along with associated information from customers' databases.



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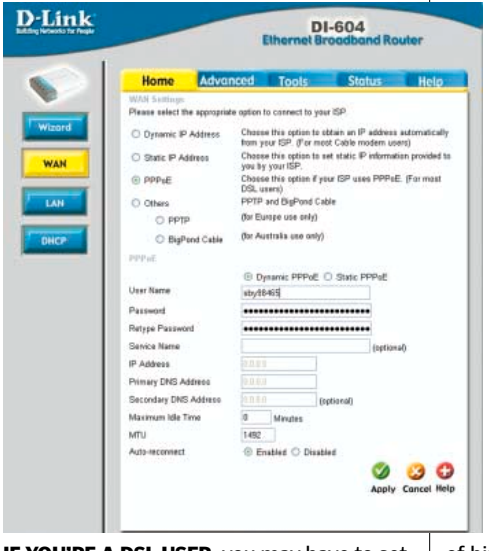
PPPoE Problem

I'm having problems getting my DSL service to work. My laptop and desktop computers are connected to a D-Link DI-604 router using Ethernet cables. SBC Yahoo! is my DSL service provider. First I called D-Link tech support; they said I needed to install PPPoE. Then I tried calling SBC Yahoo! to find out how, but they were not helpful either. Any suggestion would be appreciated

ADEBISI OLASIMBO

Many DSL providers require you to authenticate on their network before they allow you onto the Internet. They use PPPoE (Point to Point Protocol over Ethernet) to authenticate you in the same manner they would if you were a traditional dial-in customer. If your DSL provider requires PPPoE authentication, it should have provided you with a user name and password that must be configured into the router. If you don't have it, call SBC Yahoo! and ask for your PPPoE user name and password and also ask whether to set your router to static or dynamic PPPoE. Once you have this information, log into your router and click on the WAN button on the left side of the screen. Then click the PPPoE button.



IF YOU'RE A DSL USER, you may have to set up PPPoE on your router.

This will open up a page that has fields to accept your log-on credentials. Enter the PPPoE user name and password provided by SBC Yahoo! and click on *Apply*. —*Craig Ellison*

Excel Fails to Store Credit Card Numbers

I tried to input a series of numbers in a cell, i.e., 4242424242424242. The number ended with a "2", but every time I entered the number, the last digit would automatically change to a "0". I tried to format the cell several times but to no avail. I have used Excel since it came out many years ago and have never had this particular problem.

MICHAEL BAGGETT

It looks like you're trying to store a credit card number in your spreadsheet. The problem arises from the way Excel stores numeric data. Internally, Excel stores it in two pieces, a number and an exponent. It's very similar to the familiar scientific notation, in which 1,234,000,000 would be represented as 1.234E+09, except that the number and exponent are binary. This allows Excel to represent a very wide range of numbers. However, the number part is fixed in size and can represent only a predefined number of binary digits. That limit translated into decimal terms means that Excel can't store more than 15 significant digits. When you try to enter a credit card number or other 16-digit number, it loses the final digit.

Fortunately, there's a solution. When entering numeric data over 15 digits long, prefix the data with a single quote ('). This forces Excel to treat the data as text, and Excel can store text strings up to 32,767 characters long. The single quote won't appear in the cell except when you're editing it, but you'll notice that it now displays left-aligned (the default for cells containing text).—*Neil J. Rubenking*

WINDOWS XP SP2 blocks potentially dangerous attachments that are received in Outlook Express, closing a hole in which attachments seemed blocked but could be accessed by clicking on Forward.

Outlook Express Attachment Insecurity

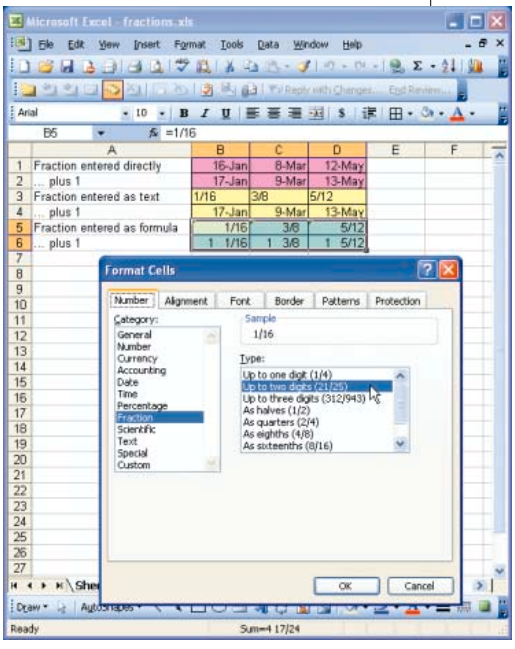
Outlook Express 6 includes a configuration setting awkwardly titled "Do not allow attachments to be saved or opened that could potentially be a virus". When this option is checked, OE blocks the user from opening a wide variety of attachment types that have potential to execute some kind of code. Clicking the paper clip icon in preview mode shows the attachment names, but the menu options to save or open them are grayed out. When the message is opened, OE displays a banner stating "OE removed access to the following unsafe attachments in your mail:."

Windows XP Professional administrators can lock down this setting using the Group Policy Editor, so it might seem a useful way to prevent children or employees from inadvertently releasing potential viruses. However, there's a gaping hole in the security provided by this setting. If the user clicks Forward, the attachment is displayed in the forwarded message, and a double click will launch it.

Fortunately, Windows XP Service Pack 2 closes this security hole. Its Attachment Manager can recognize that the file was received as an attachment even when it appears in a forwarded message, and it will prevent its execution.— *NJR*

When entering numeric Excel data over 15 digits long, prefix the data with a single quote.

The next time you load a PDF file, you should notice a significant speed improvement.



TO AVOID HAVING EXCEL convert fractions to dates, you need to enter them as formulas.

Excel Converts Fractions to Dates

I have been trying to enter numeric fractions such as 3/16 or 5/9 in Excel, but Excel converts them to dates such as March 16 and May 9. I don't want to format the cells as text. Is there a solution?
MARIO PINEDA.

Forcing the cells to text format wouldn't help, in any case. Even if you prefixed the data with a single quote (‘), Excel would still treat it as a date when used in a formula. Instead, enter the fraction as a formula, for example, =3/16. Then right-click the cell and choose Format Cells. Click the Number tab, select Fraction, and choose an appropriate type, for example, “Up to two digits”. Now the cell's value will display as you wish, and it will behave appropriately in formulas.

Excel has standard formats for up to three digits in the numerator and denominator. If you need longer fractions, choose a custom number format and type “# ????/????” where the number of question marks is the number of digits you need. The number sign (#) represents the integer portion of the fraction. If you don't use that, Excel will allow numerators greater than the denominator.— *NJR*

Update on Outlook Express Message Transfer

PC Magazine has frequently run tips explaining how you can copy and move the .DBX files that represent Outlook Express folders. This is helpful if you want to transfer your locally stored e-mail to a new machine, or to back up your messages. The technique for moving a message folder from one PC to another or for bringing an archived folder back online is fairly simple. You select Options from OE's Tools menu, click the Maintenance tab, and click the Store Folder button to determine the location of the .DBX files that represent OE folders. If you're transferring a message folder that doesn't yet exist on the target machine, you create a message folder in Outlook Express whose name matches the .DBX file in question. Then you shut down OE and copy the old .DBX file over the new one.

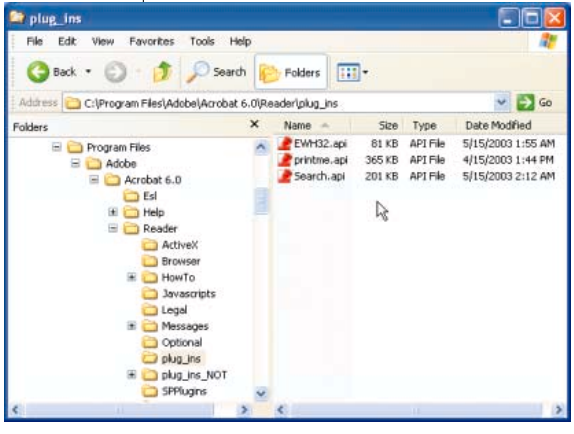
Astute *PC Magazine* reader Michael Katz discovered a problem with this technique in recent versions of Outlook Express. OE no longer creates the corresponding .DBX file for a new folder if there aren't any messages for that folder. So merely creating a new folder within OE is no longer sufficient. If at this point you bring over the old .DBX file and restart OE, the transferred messages don't appear.

The solution is simple: You must put at least one message into the newly created folder before shutting down OE. Right-click any message, choose Copy to Folder, and select that new folder. After closing OE, verify that the new .DBX file exists. Now you can successfully copy the old .DBX file over the new one.— *NJR*

Speed Loading of PDF Files

Our readers frequently ask why Adobe Reader 6 is so slow to load when they open a PDF file. The main reason is that the Reader doesn't load alone—it comes with a crowd of plug-ins. If you watch the splash screen carefully you can see their names flip past. Most people need only a handful of these plug-ins. If you'd like to load PDF files faster, follow these simple instructions:

- Launch Windows Explorer
- Navigate to the Program Files folder, usually C:\Program Files
- Below this, navigate to Adobe\Acrobat 6.0\Reader
- In the right-hand pane, find the folder named plug_ins
- Right-click it and choose Rename, changing it to plug_ins_NOT
- Create a new folder named plug_ins
- From the plug_ins_NOT folder, copy just three files to the new plug_ins folder: EWH32.api, printme.api, and search.api



PDF FILES should load a lot faster if you disable all plug-ins except the three shown here.

That's all you need do. The next time you load a PDF file, only those three plug-ins will come along, and you should notice a significant speed improvement. If you need to read encrypted PDFs or if for any other reason you want to undo this change, simply close Adobe Reader, delete the plug_ins folder and rename plug_ins_NOT back to plug_ins.—*NJR*

See more tips online at **www.pcmag.com/usertouser.**

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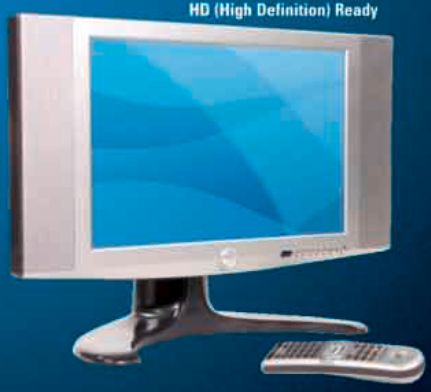

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Smart PHONES

THESE SMART PHONES HAVE THE BRAINS AND BRAWN TO TAKE MOBILE PRODUCTIVITY TO THE NEXT LEVEL

IT'S HARD TO FIND A PHONE NOWADAYS THAT DOESN'T HAVE A CALENDAR, A FEW GAMES, OR EVEN downloadable applications. But some phones go the extra mile to bring voice and data needs together, including syncing e-mail, surfing the Web, shooting pictures, and supporting hundreds of third-party apps. Some have full keyboards to get down and dirty with your e-mail. We call these multitalented devices *smart phones*.

If you're the type who craves 24/7 connectivity, a smart phone could be your answer. With one device, you can take calls, receive all your corporate and personal e-mail, and store your PIM information, including phone numbers, contacts, addresses, calendar, and to-do lists. And with the hundreds of apps available for smart phones, you can perform business tasks, like reading PDFs and Excel spreadsheets.

But smart phones aren't all business. Thanks to more powerful processors and more flexible OSs, many of these phones can play 3D games and MP3s, record and play back video, and bring together SMS and e-mail.

Many smart phones come with freely extensible OSs that can host third-party applications. These apps let you expand a phone's capabilities—giving it true smarts.

BlackBerry OS is extremely e-mail focused. BlackBerry devices hook up to corporate or Web-based e-mail servers for up-to-the-minute e-mail. (You can do this with third-party software on other smart phones.) It's also very easy to read and send e-mail on any BlackBerry. But only a few third-party applications are available to enhance the OS.

Microsoft Windows Mobile for Smartphone (which we'll call Windows Smartphone in this story) allows you to sync with PCs and Microsoft Exchange servers and offers an e-mail application similar to Outlook. There are three versions of Windows Smartphone: the first-released Smartphone 2002; the considerably faster Smartphone 2003; and Smartphone 2003 Second Edition (which adds support for higher-resolution screens).

Palm OS is best known for its easy-to-use PIM applications, stylus-based input method, and vast array of third-party apps. Another advantage of Palm OS is that it's already been test driven for years on PDAs.

Some phones opt for **proprietary operating systems,** with few or no third-party applications. Many of these have keyboards, which make them good for sending and receiving SMS and e-mail.

BY SASCHA SEGAN Photography by Thom O'Connor

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Symbian is perhaps the least known among U.S. consumers, yet it is Europe's most popular smart-phone OS. It comes in various flavors, but all the Symbian phones we tested use the Series 60 version. Symbian uses much less memory and battery power than Windows Smartphone, the other major phone-only OS represented in this roundup.

As with Palm or Windows, third-party Symbian applications do everything from read Microsoft Office documents to help you plan routes through unfamiliar cities.

When it comes to carriers, you're limited by where you live, work, and travel, as well as whatever contract you're locked into.

U.S. carriers primarily use three cellular technologies: GSM (AT&T Wireless, Cingular Wireless, and T-Mobile), CDMA (Sprint PCS and Verizon Wireless), and iDen (Nextel). GSM phones can also be sold *unlocked,* ready to use on any of the three GSM carriers.

Smart phones are still in their infancy, and it takes patience from early adopters to tap their power. But you'll be surprised at what you can accomplish with these gadgets. They may even drag you away from your good old PDA.

OUR CONTRIBUTORS: Associate editor **Jenn DeFeo** and lead analyst **Sascha Segan** were in charge of this story.

BlackBerry 7100t

BlackBerry OS, $199 list. Research In Motion Ltd., T-Mobile USA, www.tmobile.com. OVERALL RATING: ●●●●○

The new BlackBerry 7100t is nothing like any BlackBerry before it. It's the first to look, work, and feel like an actual phone. And the 7100t's impressive e-mail compatibility and bargain price put it over the top as our Editors' Choice for smart phones with keyboards in this story and in our First Looks review of October 5.

At 4.3 ounces, the 7100t fits comfortably in your hand. It has a high-quality speaker phone and supports Bluetooth wireless headsets. Because it's a quad-band GSM phone, you can use it overseas. And the 2.1-inch, 240-by-260 color display is sharp and bright.

BLACKBERRY 7100t

RIM ditched the usual full keyboard for a strange, 20-key hybrid keypad that relies heavily on predictive text. Most keys have two letters and a number on them, but the keys are in the familiar QWERTY layout. RIM's SureType predictive text system is far better than its competitors'; after 15 minutes, we were typing with ease.

The 7100t includes a full HTML Web browser; AIM, ICQ, and Yahoo! instant messaging; and very easy-to-use e-mail and PIM applications. It can access almost any personal or corporate e-mail, and the included desktop software syncs PIM data with a wide range of apps quickly and easily. It even plays downloadable Java games.

Our only criticism of the 7100t is that it lacks some more advanced business and multimedia features. For example, it strips the formatting out of e-mails and attachments, doesn't play MP3s or videos, and can't be used as a modem for your laptop.

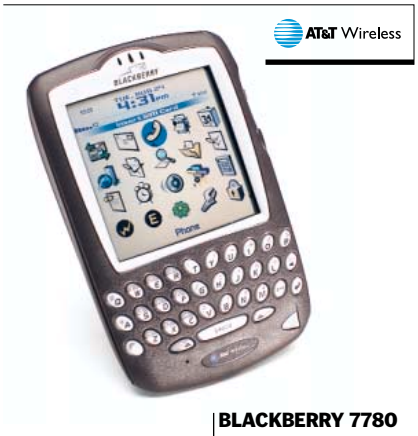
The 7100t is a new device for a new generation of users, many of whom will be lured by its low price. If you're looking for a powerful, portable, personal e-mail phone, this smart phone is no doubt an excellent buy.

SUMMARY OF FEATURES

Smart Phones

■ YES □ NO	BlackBerry 7100t	BlackBerry 7780	Motorola A630	Nokia N-Gage QD	Nokia 3620	Nokia 6620	Nokia 6820	Nokia 7610
Price	$199 list	$549.99 list	$600 street	$199.99 direct	$319.99 list	$469.99 list	$319.99 list	$550 street
List price with service contract	$199	$549.99	Info not available	$99.99 and up	$249.99 and up	$299.99 and up	$199.99 and up	Info not available
Service provider	T-Mobile	AT&T	Cingular	AT&T, Cingular, T-Mobile	AT&T	AT&T	AT&T	Cingular
Operating system	BlackBerry OS	BlackBerry OS	Proprietary OS	Symbian Series 60	Symbian Series 60	Symbian Series 60	Proprietary OS	Symbian Series 60
Form factor	Candy bar	Slab	Candy bar	Slab	Candy bar	Candy bar	Candy bar	Candy bar
Keyboard	■	■	■	□	□	□	■	□
Screen (diagonal, in inches)	2.1	3.5	1.8	2.1	2.1	2.1	1.5	1.8
Camera	N/A[2]	N/A[2]	VGA (0.3MP)	N/A[2]	VGA (0.3MP)	VGA (0.3MP)	CIF (0.1MP)	1MP
Flash memory type	None	None	None	MMC	MMC	MMC	None	RS-MMC
Processor	Info not available	Info not available	Info not available	Intel ARM4 (104 MHz)	Intel ARM4T (104 MHz)	Intel ARM4 (150 MHz)	Info not available	Intel ARM4T (123 MHz)
Internal memory (MB)	36	18	5	4	3.4	12	3.5	8
Bluetooth	■	□	■	■	■	■	■	■
Web browser	■	Optional*	□	Optional*	Optional*	Optional*	□	■
Voice network	GSM	GSM	GSM	GSM	GSM	GSM	GSM	GSM
Bands	850, 900, 1800, 1900	850, 1800, 1900	850, 1800, 1900	850, 1900	850, 1900	850, 1800, 1900	850, 1800, 1900	850, 900, 1900
High-speed data network	GPRS	GPRS	GPRS	GPRS	GPRS	EDGE	EDGE	GPRS
Continuous talk time (hrs:min)	N/A[3]	6:06	7:37	7:28	6:31	5:58	8:20	6:40

RED denotes Editors' Choice. N/A[1]—Not applicable: The phone is not sold by the carriers. N/A[2]—Not applicable: The product does not have this feature.
N/A[3]—Not applicable: We could not test the continuous talk time of the BlackBerry 7100t because of software issues. * Web browser offered as a free download.



BLACKBERRY 7780

BlackBerry 7780

BlackBerry OS, $549.99 list. Research In Motion Ltd., AT&T Wireless, www.attwireless.com. ●●○○○

As an e-mail device, the BlackBerry 7780 excels like all BlackBerry devices before it. As a smart phone, however, it's not as successful. The phone client is not up to high-quality phone standards; the device is too wide to hold comfortably, and there are few add-on applications.

With its big screen (showing up to 18 lines of text) and a QWERTY thumb keyboard, it can hook up to a Web-based client for managing individual e-mail, a desktop redirector for Microsoft Exchange or Lotus Notes e-mail, or a BlackBerry Enterprise Server for corporate setups.

Most e-mail attachments come through as barely formatted text, but contents are mostly readable. Using the included software, you can sync your calendar and contacts with Lotus Notes or Outlook.

The 7780 came with only a WAP browser. When we hooked the devices up to a corporate server with the MDS (Mobile Data Service) extension, a full Web browser popped up; it mangles tables but renders readable text and graphics.

All other uses take a backseat to e-mail. The internal speaker is relatively quiet but clear, and the BlackBerry's width makes it awkward as a phone. There's very little third-party software available, and you can't send MMS, use it as a modem, assign individual ringtones, or use other features common to many phones.

The 7780's big screen is appealing, but it's an expensive device and lacks the flexibility of other smart phones. Only choose it if e-mail is your sole and overriding need.

BlackBerry 7100t
Nokia 6620

PC MAGAZINE EDITORS' CHOICE

Our Editors' Choice for smart phones with keyboards goes to the innovative **BlackBerry 7100t.** This is the first BlackBerry that truly feels like a phone, and its quasi-keyboard with SureType predictive text is surprisingly usable. Not to mention that its e-mail and syncing capabilities are user friendly, and that a slew of third-party apps are available for BlackBerry OS. The honorable mention in this category is the **Sierra Wireless Voq Professional Phone A11.** The Voq looks and feels like a phone, cleverly integrating a flip-to-open QWERTY keyboard in its number pad, and it runs the latest version of Windows Smartphone. Unfortunately, it's available only through independent retailers.

Our Editors' Choice for phones without keyboards is the **Nokia 6620**—a truly smart phone. With its 150-MHz processor, it blazes through Symbian office apps, and it serves as a high-speed EDGE modem for your laptop. It's easy to dial, offers great sound quality, and delivers streaming video.

Motorola A630

Motorola OS, $600 street. Motorola Inc., Cingular Wireless, www.cingular.com. ●●○○○

It's compact and cute and has a comfy keyboard, but the Motorola A630 isn't a mobile office. Its lack of software and compatible applications keeps it from competing with other Cingular phones like the palmOne Treo 600 and the Nokia 7610.

The somber-gray A630 has a candy bar form factor with a somewhat dim external screen. Flipping it open reveals a bright, 176-by-220 color screen and a small-yet-adequate QWERTY keyboard.

The A630 has a hearty speaker and sounds great through a Bluetooth headset, but the speaker phone feature isn't quite loud enough. The 5MB of memory is fine for text-only e-mail and photos captured with the phone's decent VGA camera, but beware: The screen is so reflective in bright daylight that it's almost impossible to see what you're shooting.

The A630, however, cannot read e-mail attachments; you can browse only WAP (not HTML) Web sites, and the installed e-mail client is barely functional. The A630's AIM client works, but you have to endure the 20-second start-up time. A $50 data kit lets you sync your contacts and

Download this table at **www.pcmag.com**

	palmOne Treo 600	Samsung SCH-i600	Sendo X	Siemens SX1	Sierra Wireless Voq Professional Phone A11	T-Mobile Sidekick II
	$599 list	$499.99 list	$490 street	$420 street	$500 street	$299.99 list
	$349 and up	$499.99 and up	N/A[1]	N/A[1]	N/A[1]	$299.99
	AT&T, Cingular, Sprint PCS, T-Mobile, Verizon	Verizon	AT&T, Cingular, T-Mobile	AT&T, Cingular, T-Mobile	AT&T, Cingular, T-Mobile	T-Mobile
	Palm OS 5	Windows Mobile for Smartphone	Symbian Series 60	Symbian Series 60	Windows Mobile for Smartphone	Proprietary OS
	Slab	Flip	Candy bar	Candy bar	Candy bar	Swivel
	■	□	□	□	■	■
	2.7	2.2	2.0	2.2	2.2	3.3
	VGA (0.3MP)	N/A[2]	VGA (0.3MP)	VGA (0.3MP)	N/A[2]	VGA (0.3MP)
	SD	SD	SD/MMC	MMC	SD	None
	Intel ARM (144 MHz)	Intel PXA250 (200 MHz)	Intel ARM4 (120 MHz)	Intel ARM4 (120 MHz)	Intel XScale (200 MHz)	Info not available
	32	32	16	12	32	48
	□	□	■	■	□	□
	■	■	■	Optional*	■	■
	GSM, CDMA	CDMA	GSM	GSM	GSM	GSM
	850, 1800, 1900	850, 1900	900, 1800, 1900	900, 1800, 1900	850, 1800, 1900	850, 1800, 1900
	GPRS, 1xRTT	1xRTT	GPRS	GPRS	GPRS	GPRS
	7:44	2:54	6:12	9:14	3:01	7:39

MMC—MultiMediaCard, RS-MMC—Reduced-size MultiMediaCard, SD—Secure Digital.

MOTOROLA A630

calendar with Lotus Notes and Microsoft Outlook, but forget about your e-mail.

The A630 has cool phone and messaging features that will thrill SMS-heads and IM fanatics—if they're patient. But for apps-happy types and those who seek extensive e-mail and photo options, there are smarter phones out there.

Nokia N-Gage QD

Symbian Series 60, $199.99 list; with contract, $99 and up. AT&T Wireless, Cingular Wireless, T-Mobile USA, Nokia, www.n-gage.com. ●●●○○

The Nokia N-Gage QD—that's a gaming phone, isn't it? Well, surprise, surprise: There's a souped-up Nokia 3620 under the N-Gage's hood, and it can run Symbian office apps in a pinch.

Gaming aside, the N-Gage runs the usual Symbian office, utility, and entertainment software, including PDF and Microsoft Office document readers, MP3 players, and navigation programs. You'll have to load most of your apps onto MMC, though, because the device has only 4MB of internal memory. Fortunately, the N-Gage has an external memory slot. So unlike the other Nokia phones here, you don't have to remove the battery to get to the memory card.

A few big disappointments with the N-Gage: The phone's speaker volume was too low. And you can sync contacts and calendars with your PC via Bluetooth, but there's no USB cable available. And because of its

UP THE SMARTS WITH TOP UTILITIES

Customizability makes a smart phone really smart. By adding more software to your phone, you can turn it into a powerful office tool or a smooth Web surfer.

Palm OS, Windows Smartphone, and Symbian Series 60 all have cadres of third-party developers working on everything from Microsoft Office document readers to shoot-'em-up games for hungry smart-phone owners.

We focused mainly on Windows Smartphone and Symbian Series 60 here, because we've covered these OSs the least in the past. You'll find vastly more software for a Palm OS phone than for Windows Smartphone or Symbian, because Palm OS phones run programs designed for nonphone Palm handhelds. There are also a few add-on programs for the BlackBerry handhelds and the T-Mobile Sidekick II. Here are our picks for utilities to make your smart phone even smarter.

AGILE MESSENGER is our pick for a Symbian IM application.

SYMBIAN SERIES 60

Active Desk boosts the PIM power of your phone by putting calendar, to-do, and e-mail alerts on the phone's home screen. Its easy-to-use tabbed interface lets you check calendar and to-do entries with the push of a button. Oh, and it also lets you mess with your phone's wallpaper. $24.95 direct. Cibenix, www.cibenix.com.

Agile Messenger is the best (and cheapest) of several IM applications for Symbian phones that let you log on to AIM, ICQ, MSN, and Yahoo! accounts simultaneously, but you can only have one account active on each service. Buddies appear sorted by account. And conversations with different buddies appear on different tabs, so you don't get them mixed up. Free download. Agilemobile.com.

Opera 6.20 is the premier full-on Internet browser for Symbian phones. This browser supports multiple windows, forms, JavaScript, frames, SSL security, and Cascading Style Sheets (CSS). Just make sure you have plenty of RAM available: Opera runs fine on a Nokia 6620 or Sendo X, but might not load at all on a Nokia 3650. Free download; $32, with support included on some Symbian phones. Opera Software ASA, www.opera.com.

Yes, it's painful to spend almost $27 for what Adobe should be giving away, but you need **PDF+.** It has a lot of useful features, such as next page, go to page, zoom, and page rotation commands, and it handles very big and complex PDFs. $26.99 list. mBrain Software, www.mbrainsoftware.com.

Quickoffice Premier is the best way to read and edit Microsoft Excel, Word, and PowerPoint documents on your smart phone. QuickOffice offers various zoomed views and lets you lock Excel rows/columns and see PowerPoint slides as thumbnails, outlines, or speakers' notes. It mangles Word tables, but keeps a lot of other formatting. $49.95 direct. Mobility Electronics Inc., www.quickoffice.com.

Smartner Duality Always-on Mail offers push-style e-mail that really works, based on a desktop redirector program that hooks into your Lotus Notes or Microsoft Outlook account and forwards messages to your handheld. Delete a message in one mailbox and it disappears from both. Duality supports attachments, but chokes on large PDFs. $5 per month or $49.95 per year. Smartner Information Systems, available from www.handango.com.

WINDOWS MOBILE FOR SMARTPHONE

Agile Messenger, the best IM application for Symbian phones, works almost identically on Windows phones. Log on to AOL, ICQ, MSN, and Yahoo! simultaneously and chat away. Free download. Agilemobile.com.

ClearVue Suite, a package of Microsoft Office and PDF document readers, isn't perfect, but it's absolutely mandatory if you ever receive e-mail with attachments. The ClearVue applications read e-mail attachments and other documents in their native formats, maintaining most formatting. The PDF

AT&T Wireless | cingular fits you best | T-Mobile

NOKIA N-GAGE QD

bulky size, it won't fit it into your pocket.

We can't recommend this for strict business types, but gamers with a penchant for the occasional PDF or spreadsheet will be satisfied with the N-Gage. Its games don't compete with those of the Nintendo GameBoy, but they far outshine those on any other smart-phone platform.

Nokia 3620

Symbian Series 60, $319.99 list; with contract, $249.99 and up. Nokia, AT&T Wireless, www.attwireless.com.
●●○○○

Although all Nokia smart phones with Symbian use the same Series 60 interface and PIM applications, the Nokia 3620 weakens Symbian with its lack of free memory and a troublesome keypad.

The phone offers Bluetooth, a VGA camera, video recording, and an MMC slot to store photos. The earpiece speaker is loud (but the speaker phone is not).

We were frustrated when trying to dial with the 3620. The keys are crammed together, and it is too easy to misdial. Also, the menu-select button is in the middle of a four-way rocker, which is awkward.

Using Nokia PC Suite, you can sync your phone with your Lotus Notes or Microsoft Outlook contacts and calendar via Bluetooth or IR. You can also play MP3s off the MMC card. But like many Symbian phones (except the Sendo X), you can sync your Notes or Outlook e-mail

reader needs the most work: It has no jump-to-page function and breaks on heavily graphical PDFs. $29.95 direct. Westtek LLC, www.westtek.com.

Mapopolis Navigator is far, far more powerful and clearer than Pocket Streets, with tremendously useful maps that let you generate turn-by-turn driving directions with clear text and graphic instructions. But please, let the person in the passenger seat do the navigating. The maps are available for all 50 states, Canada, and 21 European countries. Mapopolis will even map addresses from your contact book and connect to a Bluetooth GPS receiver. Free download; maps, $6.95 and up. Mapopolis.com Inc., www.mapopolis.com.

Photo Contacts adds photos to your smart-phone address book and caller ID. It's easy to use, automatically finding photos on your phone with the same name as your contacts and letting you crop them on the phone. It even fixes a bug in Windows Smartphone where caller names sometimes don't show up on your display. $19.99 list. PocketX Software Inc., www.pocketx.net.

Don't want to get work calls after you head home? **SmartFilter Professional** lets you set up lists of unwanted callers whose numbers will then transfer directly to voicemail. You can switch between lists, either manually or automatically based on the time of day. Setting up the lists can be a little tedious, but it's worth it. SmartFilter can also block everyone who isn't in your phone book, a good feature if your work calls tend to come from semi-random numbers on a PBX. A $12.95 light version has all the same features sans automatic blacklist switching. $22.95 list. Novosec AG, www.smartphone.net.

SMARTFILTER keeps unwanted callers away.

Xbar 2.0 is the slickest task manager out there for Windows smart phones. It lets you switch between running programs, quit programs quickly, and check your current memory and battery usage—all without having to dig down into the Start menu. It also helps compact fragmented memory, making your phone more efficient. Should this have been part of the Windows Smartphone OS to begin with? You bet. $6 list. XetraNet, http://xetranet.free.fr.

PALM OS

Beyond Contacts not only syncs with Microsoft Outlook, it looks like Outlook. This app delivers Outlook calendars, contacts, tasks, notes, and e-mail to your Palm OS device, retaining even obscure contact fields and slapping a Pocket PC–like Today screen on top of it all. And the PIM applications are very tightly integrated. For example, you can create and send meeting requests for multiple attendees from the calendar application. $29.99 direct. DataViz Inc., www.dataviz.com.

DocumentsToGo 7 Premium Edition is the best Palm OS application for Microsoft Office documents. With it you can read and edit Microsoft Word, Excel, and PowerPoint files from a convenient unified interface. DocumentsToGo preserves fonts, colors, type styles, tables, and even Excel charts. But use Adobe's free PDF reader instead of this one. $49.99 direct. DataViz Inc., www.documentstogo.com.

BLACKBERRY OS

To live with a BlackBerry is to live at the mercy of others. The BlackBerry add-ins all require MDS (Mobile Data Service), an option on the BlackBerry server that your corporate IT department can activate (or not). Individual BlackBerry owners with Nextel get MDS; AT&T Wireless, and T-Mobile BlackBerry owners don't.

Sick of WAP-ing around on your BlackBerry? Then get **Reqwireless WebViewer,** a full Web browser that handles image maps, as well as secure connections and forms. Unfortunately, it does not support JavaScript. It reformats pages to fit on your BlackBerry screen, making them look jumbled. Still, it's a useful, quick-and-dirty way to get the Web on your BlackBerry. $29.99 direct. Reqwireless Inc., www.reqwireless.com.

With the **WebMessenger** application (RIM J2ME client) and subscription service, you can log on to the AIM, ICQ, MSN, and Yahoo! instant messaging networks simultaneously. You can have only one account active on each network, and you must stick to text-only messages. But this is still the best IM solution available for BlackBerry devices. $48 per year direct. WebMessenger Inc., www.webmessenger.com.—*Sascha Segan*

SCORECARD

We based our judging of the phones in this story on five categories: phone features, smart-phone features, multimedia, messaging and data, and e-mail capabilities. The **phone features** score considers basic criteria, such as size, weight, audio quality, battery life, ringtones, and button and menu usability. The **smart-phone features** score reflects the quality of games, PC connectivity, the availability of office and other third-party apps, Web browsing, memory, and expandability. The **multimedia** score is an assessment of screen quality, camera quality, and audio and video playback. For the **messaging and data** score, we consider features such as SMS, MMS, instant messaging, Bluetooth, and the ability to use the phone as a modem for a laptop. The **e-mail capabilities** score reflects POP3/IMAP, corporate, and AOL e-mail, as well as handling attachments and the presence of a QWERTY keyboard. Finally, we weighted those five scores to derive an **overall** score.

●●●●●—EXCELLENT
●●●●—VERY GOOD
●●●—GOOD
●●—FAIR
●—POOR

	Phone features	Smart-phone features	Multimedia	Messaging and data	E-mail capabilities	OVERALL
BlackBerry 7100t	●●●◐	N/A	●●●	●●●	●●●●●	●●●●
BlackBerry 7780	●	●	●●◐	●	●●●●●	●●
Motorola A630	●●●●●	●	●●●	●●●●◐	●	●●
Nokia N-Gage QD	●●◐	●●●●	●●●◐	●●●●	●◐	●●●
Nokia 3620	●●	●●	●●◐	●●●◐	●◐	●●
Nokia 6620	●●●◐	●●●●◐	●●●	●●●●●	●◐	●●●●
Nokia 6820	●●●●●	●	●	●●●●●	●	●●◐
Nokia 7610	●●●●	●●●●	●●●◐	●●●●	●◐	●●●◐
palmOne Treo 600	●●●◐	●●●●●	●	●●●◐	●●●●●	●●●●
Samsung SCH-i600	●◐	●●●●◐	●●●●	●●	●●●	●●◐
Sendo X	●●●●	●●●●●	●●◐	●●●●●	●●●	●●●●
Siemens SX1	●●	●●●●◐	●●●●	●●●●◐	●◐	●●●
Sierra Wireless Voq Professional Phone A11	●●●	●●●●◐	●●●●◐	●●●●	●●●●●	●●●●
T-Mobile Sidekick II	●●●◐	●	●	●●●	●●●◐	●●◐

RED denotes Editors' Choice. N/A—Not applicable: We could not rate the BlackBerry 7100t in this category because the prerelease version we tested was not loaded with the final software for IM and Web browsing.

only via a third-party application.

The phone has so little free RAM that you can't run the Quickoffice Microsoft Office document reader. The phone also scored the lowest of any Series 60 device on most of our benchmark tests.

NOKIA 3620

Unfortunately, the 3620 doesn't live up to its smart-phone status, mainly because of its paltry memory and crammed keypad. For better performance and smart-phone features, consider the Nokia 6620 instead, another Symbian smart phone by AT&T.

Nokia 6620

Symbian Series 60, $469.99 list; with contract, $299.99 and up. Nokia, AT&T Wireless, www.attwireless.com.
●●●●○

PC MAGAZINE EDITORS' CHOICE

The Nokia 6620, our Editors' Choice for smart phones without keyboards, has a little something for everyone: flashy multimedia, high-speed data transfer, and Symbian expandability.

If you're looking for a phone you can fill with third-party apps, the 6620 has an impressive 27MB of built-in RAM, 12MB of built-in flash, and an MMC slot. Aside from

NOKIA 6620

the standard Nokia PIM applications and Nokia's PC sync, the 6620 comes loaded with the Opera Web browser and RealPlayer. It also supports AT&T Wireless's EDGE high-speed data network.

Even at the typical Series 60 176-by-208 resolution, the 2.1-inch screen seems roomy. The phone speaker sounds great, and the VGA camera takes decent if slightly dim photos and video.

The real perk, though, is its EDGE performance. When connected to our test laptop via USB cable, the 6620 consistently delivered 80-Kbps data rates. That beats GPRS networks by a factor of two. You can take advantage of EDGE to watch streaming video, such as sports games. In fact, we were happy to check out smooth and sharp video of Yankees highlights on the phone.

Thanks to its 150-MHz processor, the 6620 blew past other Symbian phones in memory, disk access, and 2D-image tests, although the Nokia 7610 beat it handily on JPEG compression.

The 6620 may not have all the neat add-on software of the Sendo X, but what it has is cool. Not to mention that it's easier to dial and amped up with more horsepower.

Nokia 6820

Nokia OS, $319.99 list; with contract, $199.99 and up. Nokia, AT&T Wireless, www.attwireless.com. ●●◐○○

The Nokia 6820 has wings. It looks like a compact phone, yet with a quick flip, it reveals a split QWERTY thumb keyboard, flanking either side of the screen. Suited for text messaging and simple e-mail, it also has Bluetooth and supports the high-speed EDGE data network, giving it business-traveler appeal. And the ability to add BlackBerry Connect software later this year will up the appeal even more.

The keyboard's keys are large but close together, so some people may mistype by

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rocking their fingers the wrong way. The split keyboard also takes getting used to. Although the screen is small (1.5 inches), we found it usable for short messages. The camera is the lowest quality we've seen—lower resolution than VGA—and it shows.

As a smart phone, the 6820 doesn't have a high-power OS, but you can still sync contacts and calendar information with Microsoft Outlook. The phone also supports SMS, MMS, and a very simple POP3/IMAP e-mail client (no attachments, or syncing).

The phone can support AOL, ICQ, MSN, and Yahoo! instant messengers. Unfortunately, there's no Web browser beyond basic WAP.

We mated the 6820 with an IBM laptop via USB cable, and like the Nokia 6620, it delivered an impressive 80 Kbps in midtown Manhattan, using AT&T Wireless's EDGE network.

The 6820 earns innovation points for cramming a QWERTY keyboard into a compact space. But if you're looking for more flexibility in a keyboard phone, try the Sierra Wireless Voq Professional Phone A11.

AT&T Wireless

NOKIA 6820

Nokia 7610

Symbian Series 60, $550 street. Nokia, Cingular Wireless, www.cingular.com. ●●●◐○

The Nokia 7610 is smart and fun, offering the only 1-megapixel camera in our roundup. It combines unique style and power with Symbian Series 60 flexibility.

The 7610's swoosh-shaped number keypad looks weird but works intuitively if you're right-handed. The phone also has a bright, readable screen and an excellent speaker, although, like many other Symbian phones, it's missing a dedicated volume button, which is annoying.

cingular

NOKIA 7610

The 7610's 1,152-by-876 camera is a great leap forward for phones, making images more detailed and brighter.

As a smart phone, the 7610 offers plenty of room for Series 60 applications. Its 8MB of internal memory let you install bigger applications onto the included 64MB RS-MMC (reduced-size MMC) memory card. On SPMark04, the 7610 came in second overall (after the Nokia 6620), with especially high scores in 2D- and 3D-graphics performance and JPEG encoding.

Pssst! The Smart-Phone Scoop

We love to get the scoop on new products, so we can share the news with you. Here's a peek at some of the cool smart-phone products in the works.

The **Motorola MPx** is a magic trick of a device with a unique dual hinge that lets you answer calls by flipping it open and up. For more data-intensive communications, you can open it horizontally like a laptop and type away on the QWERTY thumb keyboard. The 2.8-inch (240-by-320) TFT touch screen is ideal for reading e-mails, attachments, and browsing the Web. Plus, there's a stylus for touch tapping. Wireless options include 802.11b, Bluetooth, and quad-band GSM/GPRS networks. The MPx runs Microsoft Windows Mobile for Pocket PC—not Windows Smartphone.

There's also a 1.3-megapixel (MP) camera, as well as an SD/MMC slot for up to 1GB of add-on memory. Price and carrier not yet determined. Motorola Inc., www.motorola.com.

The **Motorola MPx220** is a small quad-band Windows Smartphone device. The MPx220 is loaded with cool features, including a 1.2-MP camera with flash, Bluetooth capability, a speaker phone, 64MB of flash memory, and a mini-Secure Digital expansion slot for even more storage. The MPx220 will be available at the end of the year. Price and carrier not yet determined. Motorola Inc., www.motorola.com.

The **palmOne Treo 650** will have a higher-resolution LCD screen (320-by-320) than the Treo 600 and dedicated answer and disconnect buttons. It's also adding Bluetooth, a 1.3-MP camera, video recording, and possibly a removable battery. The Treo 650 is expected to hit stores this fall and be offered by Sprint PCS. Price not yet determined. palmOne Inc., www.palmone.com.

The **Samsung i550** is the rumored successor to the popular i500. This high-end flip phone will reportedly include a 1-MP camera with flash and an OLED outer display. The i550 will run on Palm OS 5.2 and support thousands of Palm applications. It will also include MP3 and MPEG-4 playback and voice dialing. The i550 will be available at the end of the year and is tentatively slated to be carried by Sprint PCS. Price not yet determined. Samsung Electronics America Inc., www.samsung.com.

The **Sony Ericsson** P910 improves on the earlier Symbian OS P900 by adding a QWERTY thumb keyboard to the back of the flip face, giving it greater leverage for e-mailing. Sony Ericsson has also increased the internal memory from 16MB to 64MB, as well as included a 32MB Memory Stick Duo in the box. Tri-band GSM/GPRS coverage lets you roam the world. This model will be available at the end of September. $600 list and up. Sony Ericsson Mobile Communications AB, www.sonyericsson.com.

—Jenn DeFeo

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Aside from Nokia's standard Series 60 PIM and e-mail applications, the 7610 comes with the Opera Web browser, RealPlayer, and two cool applications: a mobile version of the muvee movie-editing software and Nokia Lifeblog, which lets you look at all your e-mail, text messages, and videos in chronological order on your phone or PC screen.

For something more serious, the Sendo X (with out-of-the-box e-mail syncing) and Nokia 6620 (with EDGE) are better options. But for working fun, the Nokia 7610, with its stellar camera and cool looks, is a sure hit.

palmOne Treo 600

Palm OS 5, $599 list; with contract, $349 and up. AT&T Wireless, Cingular Wireless, Sprint PCS, T-Mobile USA, Verizon Wireless, palmOne Inc., www.palmone.com.
●●●●○

It's a measure of the palmOne Treo 600's excellence that this year-old handheld is still a top option for people looking for an equal balance of phone and PDA functions. It's also available on a wider variety of carriers than any other smart phone in our roundup.

At 5.8 ounces, the Treo looks and feels more like a PDA than a phone. Yet, it's easier to hold and fit into your pocket than the BlackBerry 7780 or T-Mobile Sidekick II. The thumb-style QWERTY keyboard is small, but the domed keys

PERFORMANCE TESTS

SMART-PHONE IQ TEST

Testing smart phones is tough, because many of the phones have different operating systems and widely different feature sets. That makes an apples-to-apples performance comparison complicated.

Rising to the challenge, we designed a slew of tests to gauge the intelligence of these phones. Our tests measure both basic phone features, such as audio quality and ringtones, and smart-phone features, such as office applications that take cell phones to the next level as PDA replacements.

Our scorecard (page 98) boils down the 97 tests we performed on each phone. Some tests mark the presence of features, such as high-speed data transfer, voice commands, a camera flash, or external volume buttons. Other tests offer even more insight: talk times, the quality of their cameras, and their ability to use the phone with a Bluetooth modem.

BENCHMARK TESTS

High scores are best.
Bold type denotes first place.

	System Score	3D Score	SPMark04
Nokia N-Gage QD	664	487	913
Nokia 3620	559	453	793
Nokia 6620	**1,025**	563	**1,282**
Nokia 7610	861	**575**	1,146
Sendo X	652	422	858
Siemens SX1	662	505	935

RED denotes Editors' Choice.

SPMARK04 FOR SYMBIAN OS SMART PHONES

For the six smart phones in our roundup running Symbian, we used a new testing suite called SPMark04 from FutureMark—maker of the 3DMark and PCMark benchmark tests we use for PC testing.

SPMark04 produces three sets of results. System Score includes the 2D and PIM tests. The 3D score comes from only the 3D tests; so if you must have a phone that plays games, this is important. Beware, though, that best-in-the-industry 3D performance these days is still pretty poor. The SPMark04 score combines the two to give an overall performance impression. The Nokia 6620 achieved the best overall score, contributing to its selection as our Editors' Choice for phones without a keyboard.

For gaming, the benchmark test measures the speed of 3D games by running a simulated helicopter game.

For business, the tests calculate the speed of basic PIM features by inserting and deleting entries in a phone's contacts and calendar databases. The Nokia 6620's 150-MHz processor pushed that phone way ahead of the pack on business application tests.

For photos, SPMark04 tests a phone's ability to scale and encode JPEG images used by the phone's camera and gallery applications. There, the Nokia 7610 posted far better scores than the other phones, because of hardware associated with its 1-megapixel (MP) camera. In addition, SPMark04 measures a phone's general 2D graphics performance, relevant for general UI performance. Both the Nokia 7610, with its advanced camera hardware, and the 6620, with its fast processor, did very well on the 2D tests.

BATTERY LIFE TESTS

For our battery life score, we considered both our own lab-tested talk time and the manufacturer's estimated standby time; the final score was weighted 70/30 in favor of talk time. For our talk time test, we find a location where each phone has maximum signal strength, and call a special landline that recites a set of sentences continuously until each phone goes dead.

Our test will typically give much longer talk time results than normal day-to-day use, where the average call length is about three minutes. Connecting calls uses more juice than making one ongoing call, and making many short calls lights up the phone's battery-gobbling backlight more often than our test does.) Yet it's still a good indication of how the phone will fare, and how it compares on a level playing field with the other phones.

For example, we found that phones with Windows Smartphone have much shorter battery lives than other phones.

JURY TESTS

Many of our tests require analysis; for example, we judge and compare sound quality by listening to a scripted message that we leave on an answering machine using each phone. And we photograph a simulated daylight scene in our photo lab using each phone's camera, then compare the quality of those photos.

The Nokia 7610 came out best in our camera tests, and not just because of its 1-MP resolution; it had a truer, wider range of colors than any other phone.—*Analysis written by Sascha Segan*

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The Treo's greatest strength is Palm OS 5.2.1, with its thousands of available applications. Various browser and e-mail options are available, including Good Technology's GoodLink, a BlackBerry-like enterprise solution that wirelessly connects and syncs your Treo to Microsoft Outlook, and Inbox To Go, an Outlook-compatible solution that polls your Outlook in-box as often as you like.

The Treo's Secure Digital memory slot supports SD I/O, but the slot's power is too low for Bluetooth or Wi-Fi cards. Fortunately, the unit comes with a USB cradle for transferring files.

The Treo's low-res (160-by-160) screen is starting to look old, and we'd love to see palmOne integrate Bluetooth or Wi-Fi and add a higher-res camera than the current VGA. (Get a glimpse of the new Treo, rumored to be coming out this fall, in our sidebar "Pssst! The Smart-Phone Scoop," page 100.) That said, the palmOne Treo 600 is still a very good smart phone if you like Palm OS and don't mind a bulkier form factor.

Samsung SCH-i600

Windows Mobile for Smartphone, $499.99 list. Samsung, Verizon Wireless, www.verizonwireless.com.
●●◐○○

The Samsung SCH-i600 is a serious flip phone that uses Windows Smartphone to sync contacts, calendars, and e-mail, as well as perform a slew of other tasks.

The bulky i600 flips open to show a number keypad with flat, responsive, clear labels and a comfortable four-way rocker. The 2.2-inch internal display is sharp, and call quality is decent.

Although Windows Smartphone's ability to sync your contacts and calendar wirelessly with Microsoft Outlook is addictive, the device's e-mail sync functions are spotty and its talk time is awful (2:54)—the shortest of any phone here. But the i600 does come with an extended battery that promises 4.7 hours.

SAMSUNG SCH-i600

The i600 can also work as a mobile modem on Verizon Wireless's 1xRTT data network, using the bulky included USB cradle. But without Bluetooth, the i600 has no easy way to connect wirelessly to a laptop.

Although the phone comes with basic PIM, e-mail, and games, the benefit of Windows Smartphone is that it lets you sync e-mail and run a slew of third-party apps, including Microsoft Office document readers, PDF readers, games, navigation software, and MP3 and video players.

Windows Smartphone 2002 is slower and less media-friendly than Smartphone 2003. (The i600 we tested ran Smartphone 2002. Verizon now offers a Smartphone 2003 upgrade, which should improve e-mail sync and media friendliness but does not change our conclusions here.) The next generation of Windows phones goes a step farther for the same price. Your best bet is to bypass this i600 altogether. Opt for the Sierra Wireless phone or the upcoming Sprint PCS version of the i600.

Sendo X

Symbian Series 60, $490 street. AT&T Wireless, Cingular Wireless, T-Mobile USA, Sendo, www.sendo.com. ●●●●○

The Sendo X is a sexy smart phone that maximizes the power of Symbian OS and comes preloaded with everything from e-mail sync to Opera.

A GSM world phone, the Sendo X is available through third-party retailer eXpansys. It's loaded with fun phone features like slick voice dialing, a VGA camera, and built-in MP3 player that can use MP3s as ringtones, too. But the screen is somewhat dim and too reflective. The buttons are narrow and stick out a bit, which can lead to accidental dialing.

The phone has extended Symbian Series 60 and starts up with a unique Now screen similar to the Today screen (with appointments and tasks) on Pocket PC devices. Sendo includes a USB cable, along with PC software to sync contacts, calendars, and even e-mail with Lotus Notes or Microsoft Outlook—the only Symbian phone that can do this out of the box.

Sendo's built-in Opera Web browser far outshines other mobile browsers, and you can open JPEG and Microsoft Word and Excel e-mail attachments using the phone's built-in viewers. The phone has 32MB of built-in flash memory.

Its SPMark04 scores were well below the Nokia 7610 and 6620, which was evident when paging through Web screens or viewing PDFs. The Sendo X's System score wasn't bad, but it performed poorly on the 2D and 3D graphics tests.

Our overall experience was marred, though, because when downloading mail, installing applications, and even taking photos, our phone crashed. This was due to buggy firmware, and Sendo says it is working on a fix. Other than that, the Sendo excels as a Symbian smart phone, because it preloads the apps and includes the features you need to be productive.

Siemens SX1

Symbian Series 60, $420 street. AT&T Wireless, Cingular Wireless, T-Mobile USA, Siemens Mobile, www.siemens-mobile.com. ●●●○○

The Siemens SX1 is a tough sell, with its wacky keypad layout: All the numbers are arranged vertically, down both sides of the phone. On top of that, it's hard to tell when

PALMONE TREO 600

SENDO X

these strangely placed buttons have been effectively pressed. But if you can get past the keypad, the SX1 is a solid smart phone.

The SX1 is carried by third-party retailers and will work on AT&T Wireless, Cingular Wireless, and T-mobile networks. For a phone, call quality is good, and so is the VGA camera. The built-in FM radio is a neat feature that uses your headset wire as an antenna.

As a smart phone, the device can sync to standard POP3/IMAP e-mail clients, SMS, and MMS. A WAP browser is preinstalled, but you can download Opera for free.

The SX1 has an external MMC slot that doesn't require you to remove the battery to change it. Along with the card slot, there's an adequate amount of internal memory (12MB) for documents and applications.

On our tests, the SX1 finished in the middle of the pack, turning in an overall SPMark04 score that put it in third place among the six phones tested.

The SX1 would be a leading Symbian contender if not for its keypad. We say stick with a more traditional smart phone like the Nokia 6620.

Sierra Wireless Voq Professional Phone A11

Windows Mobile for Smartphone, $500 street. AT&T Wireless, Cingular Wireless, T-Mobile USA, Sierra Wireless, MobilePlanet, www.mobileplanet.com. ●●●●○

The well-designed Sierra Wireless Voq Professional Phone A11 is for people who care about e-mail and voicemail and need flexibility in a phone. Although its short talk time leaves us with some reservations, its feature set is strong enough to earn it an honorable mention.

With Windows Smartphone 2003, the Voq has a familiar Windows interface, as well as smooth PC-syncing and integration abilities. The comfortable fold-out QWERTY keyboard makes it even better for keeping up with your messages. The Voq is available through independent retailers and works with AT&T Wireless, Cingular Wireless, and T-Mobile cellular networks.

Though similar in size to the Samsung i600, the Voq is more compelling in some ways. Aside from its keyboard and updated Windows OS, the Voq includes the VoqMail application for push-style e-mail from IMAP4 mail accounts. MyVoq, another custom application, helps you find data within the device.

The keys feel smaller and closer together than those on the BlackBerry or Sidekick devices, but we still found them usable. The speaker-independent voice recognition also works well and does not require a tedious training process.

The 2.2-inch, display is bright and clear, and we like the externally mounted Secure Digital card slot. You'll use SD cards mostly to play MP3s and video files, because the Voq has no camera. There's also no Bluetooth connectivity, but a USB cable is included. With all these productivity features, it's disappointing that like the Samsung i600, its talk time was poor (3:01).

The Voq is a solid Windows Smartphone device with a handy fold-out keyboard aimed at people who want to take some level of office productivity with them everywhere—and don't mind frequent recharging.

SIEMENS SX1

SIERRA VOQ PROFESSIONAL PHONE A11

T-MOBILE SIDEKICK II

T-Mobile Sidekick II

Proprietary OS, $299.99 list. T-Mobile USA, www.t-mobile.com. ●●◐○○

We love the T-Mobile Sidekick II for what it is—a fun, cheery, phone/e-mail device. But its chunky profile and lack of third-party software makes it tough for us to consider the Sidekick a serious smart phone.

The Sidekick II features a unique flip-up screen, which when swiveled and opened reveals a very usable QWERTY keyboard. With the screen closed, you can use external buttons to make phone calls or shoot pictures with the VGA camera and flash.

In addition to enjoying basic PIM applications, you can sync contacts and calendars with Microsoft Outlook via a Web interface—but it's a bit awkward. Setting up POP3, IMAP, or AOL mail accounts and Yahoo! Messenger or AIM is easier than with the Motorola A630. Microsoft Office and PDF attachments show up as plain text built into a message, and you can do basic Web browsing.

There are only a handful of third-party applications for the Sidekick, and almost all of them are games. And don't look for enterprise-friendly features here: There's no Lotus Notes- or Microsoft Outlook-compatible solution.

For personal e-mail any time, anywhere, the Sidekick is a snazzy and fun choice. But it still looks a bit like a brick, and its growth is stifled by the lack of compatible third-party software, which puts it behind phones in this roundup running more fertile OSs.

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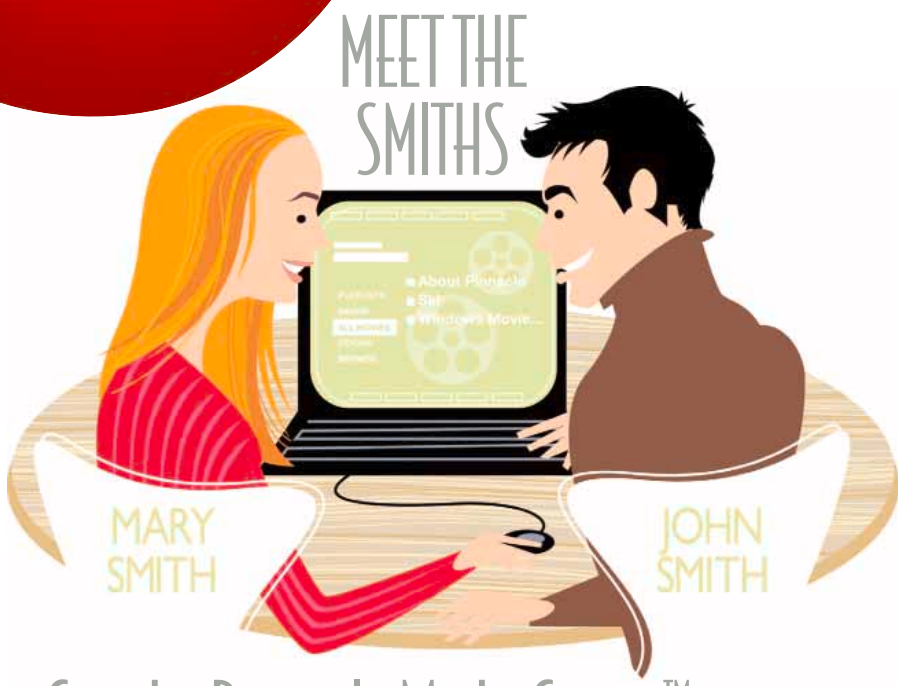

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The Smiths have a problem. They've got a PC and they use it for all of their work—the bills, the emails, the take home work. But all work and no play make the Smiths and their PC pretty dull. Isn't it about time they had a little fun with their PC?

Mary wants to be able to record her favorite reality shows so she doesn't have to worry about missing them while she puts the kids to bed.

John wants to watch Monday Night Football just once without interruption. He doesn't mind skipping the commercial breaks because he says they're adding a few too many "snack" pounds around his middle.

Mary wants to use the computer to keep her photos of the kids, the vacations and the birthday parties organized. She loves to kick back and watch a photo slideshow.

John has over 200 hours of digital music he'd like to be able to store in one place and access whenever he wants. He also likes to create his own playlists.

Mary likes to watch movies. She's a fanatic. Give her a few hours and she'll curl up with a good chick flick.

What do John and Mary agree on? They hate keyboards and wish there was one place to bring all their media dreams together.

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Killer Graphics

New graphics chips offer awesome realism in PC games, but you'll spend a pretty penny. We rate nine top-of-the-line graphics cards to help you choose the best one for your needs. By Loyd Case

Advances in PC game graphics have been slow for the past few years, even while graphics chips have been getting increasingly powerful. That's finally changing this year: We're now starting to see games that tap into the latest advances in GPU (graphics processing unit) technology. Earlier this year, Far Cry set a new standard for lush visuals, and the recent release of id Software's Doom 3 has upped the ante. We expect more games using advanced graphics engines to ship in early 2005.

REVIEWED IN THIS STORY

108 ASUS AX 800 XT ●●●●◐
108 ASUS V9999 Ultra Deluxe ●●●●◐
109 ATI Radeon X800 XT Platinum Edition ●●●●○
109 BFG GeForce 6800 GT OC ●●●●◐
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Now that A-list titles are taking advantage of new graphics technologies, gamers want the cutting edge. The choice of high-end graphics chips is down to those made by two competitors: ATI Technologies, from Toronto, and nVidia Corp., based in Silicon Valley. These companies take slightly different approaches to delivering fast, realistic graphics on the PC.

In this story, we compare nine new cards based on the latest top-of-the-line chips: ATI's Radeon X800 XT Platinum Edition and nVidia's GeForce 6800 Ultra. Read on to decide where you should lay down your hard-earned $400 to $500.

nVidia's 6800 line offers an entirely new GPU architecture that supports an advanced programming model called Shader Model 3.0 (part of the Microsoft DirectX 9.0 interface). This offers a simpler programming style for game developers. It also enables better performance. To benefit from Shader Model 3.0–programmed games, you need to install the latest version of DirectX, 9.0c, available at *www.microsoft.com/windows/directx/default.aspx*.

ATI was more conservative in this latest escalation of the GPU competition. The company's new X800 architecture builds on its successful Radeon 9800 line and adds more processing units, greater pixel-pushing bandwidth, and increased clock speed. A few tweaks have been added to the ways it can be programmed, but the new chip doesn't support Shader Model 3.0.

Games that can take advantage of Shader Model 3.0 will still run on cards that don't support the new programming model. These games typically have multiple ways of rendering animation and use the one that works best for the card present. Because most games don't support Shader Model 3.0, choosing an ATI card won't put you at a disadvantage yet.

The performance of the ATI and the nVidia chips is neck and neck on most games. Two exceptions we saw: Doom 3 does noticeably better with nVidia, and Far Cry does better with ATI.

Another difference between the chips is their power requirement. The latest nVidia-based cards are hungrier for current: They need at least a 480W power supply and two Molex connectors (the type of power connector used by hard drives) in your system. ATI-based cards generally require just one power connector and a 300W supply.

With few differences in performance and pricing, how do you choose the best graphics card for your needs? Your decision will likely come down to brand preference. But we suggest you also consider power and slot-space requirements, warranties, support, and bundled goodies like game and graphics-editing software. Read on to learn what you get with each card.

MORE ON THE WEB

Point your browser to www.ExtremeTech.com to read more in-depth coverage of graphics hardware.

OUR CONTRIBUTORS:
Loyd Case is technical director, **Dave Salvator** is senior technology analyst, and **Jason Cross** is technology analyst at ExtremeTech.

ASUS AX800 XT

$499 list. Requires: 300W power supply; one AGP 2.0 slot; one Molex connector. Warranty: 3 years. ASUS, www.asus.com. RATING: ●●●●◐

The ASUS AX800 XT, based on the ATI Radeon X800 XT, offers more goodies than most graphics card packages. For starters, it includes the usual connectors: a DVI to VGA adapter; component, composite, and S-Video video cables for a TV; and a power cable in case you need another Molex plug. The card is orange and occupies a single slot in your PC, and the heat sink/fan lights up blue when you power up. Performance is on a par with other X800 XT Platinum Edition cards.

It's all the extras that make this card special: ASUS includes its own GameFace software, which uses video overlay to show webcam video of your online opponents. It even bundles a basic webcam. You also get full versions of the hit games Counter-Strike: Condition Zero and Deus Ex: Invisible War; the Ulead editing software Photo Express 4.0 SE and Cool 3D 2.0; and an ASUS-branded software DVD player (WinDVD). At close to $500, this card isn't cheap, but ASUS's impressive bundle adds a lot of value.—*Jason Cross*

ASUS V9999 Ultra Deluxe

$600 street. Requires: 480W power supply; one AGP 2.0 slot; two Molex connectors. Warranty: 3 years. ASUS, www.asus.com

●●●●◐

The top-of-the-line nVidia card from ASUS costs nearly $100 more than the company's best ATI card. Performance is at the same stellar level as most other GeForce 6800 Ultra cards, and the card's requirements are mostly similar. One exception: Most other cards require two slots, but the ASUS needs just one. You do need an extremely robust power supply (480W) and two free Molex connectors, preferably on separate power lines. This ASUS card has dual DVI connectors and comes with two DVI-to-VGA adapters. The TV-out jack supports composite and S-Video connections, but not component video.

The game bundle includes Deus Ex: Invisible War, a decent game, and the unimpressive Battle Engine Aquila and Gun Metal titles. Unique to ASUS is its GameFace software for putting a webcam video overlay into your games, and ASUS even supplies the webcam. It's a relatively low-quality 640-by-480 cam but gets the job done. The package also includes ASUS DVD XP, a rebranded version of the WinDVD DVD player software. The real reason to shell out $600 for this card isn't the bundle; it's the fact that it fits in a single slot.—*JC*

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GET IT NOW

ATI Radeon X800 XT Platinum Edition

$499 direct. Requires: 300W power supply; one AGP 2.0 slot; one Molex connector. Warranty: 3 years. ATI Technologies, www.ati.com

●●●●○

ATI's Radeon X800 XT card is the original on which all other Radeon cards are based. Companies like ASUS, Sapphire, and VisionTek sell nearly identical cards with the chips and reference designs they purchase from ATI, but they do more to add value.

At $499, ATI's card costs about the same as other brands, but you won't find as many goodies in the box. It includes a DVI-to-VGA adapter for dual analog monitors (the card comes with one DVI, one VGA, and one TV output), a power cable connector in case you don't have a spare Molex plug dangling inside your case, and a CD of ATI drivers and media playback software. The TV output plug can accept the included composite, component, and S-Video output cables.

Its excellent performance is right in line with other X800 XT–based cards. The problem is that you don't get a great software bundle. Competing cards pack in recent games at the same price. The three-year warranty is good but not uncommon. When the ATI brand card was the only X800-based card you could find, it was a good deal. Now it's a great card, but you can do better.—*JC*

ASUS V9999 Ultra Deluxe

PC MAGAZINE EDITORS' CHOICE

As our performance tests show, all the new top-of-the-line graphics cards perform at a comparable—and blazingly fast—level. Your choice depends mostly on the system you intend to install it in and which games you play, and then on how much you like the bundled goodies. If your power supply is only 300W, a card based on the ATI Radeon X800 XT GPU would save you the hassle of buying and installing a new power supply.

Because this is the high end and we're not letting price deter us, we pick the ASUS V9999 Ultra Deluxe card. Unlike the other cards based on nVidia's GeForce 6800 Ultra, it requires only one slot. Its game bundle includes the impressive Deus Ex: Invisible War, and you even get a webcam with your purchase. We consider the three-year warranty ample, as you'll probably be in the market for a next-generation card by that time anyway.

For bargain hunters who still want good gaming speed, we give honorable mention to the BFG GeForce 6800 GT OC. For a hundred bucks less than most others, you get a card that performs at almost the same level.

We also single out the PNY Verto 6800 Ultra for its leading performance test results (though too much should not be read into this, as it was by the slightest of margins), and the Sapphire and VisionTek cards for including video in. If you're looking for a great game bundle, check out the cards from Sapphire and LeadTek, and the ASUS AX800XT.

BFG GeForce 6800 GT OC

$400 street. Requires: 300W power supply; one AGP 2.0 slot; one Molex connector. Warranty: lifetime. BFG Technologies, www.bfgtech.com.

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Overclocking is usually best left to hobbyists who don't care about warranties. But BFG takes a different approach: Many of its cards go out the door overclocked and with a lifetime warranty on parts. The BFG GeForce 6800 GT OC is overclocked by about 6 percent, which isn't dramatic but is enough to nip at the heels of the nVidia GeForce 6800 Ultra–based cards, and for $100 less. Keep in mind, however, that it doesn't come with the full game bundles you get with other cards.

A slightly beefed-up cooling system allows the chip to be overclocked. But the cooling unit isn't bulky and fits in a single slot. The six-page installation guide is good for first-time card installers.

The 6800 GT OC's performance was slower than cards using the GeForce 6800 Ultra, as you'd expect from its slower GPU core clock speed. It still ran all of our test games at acceptable frame rates. It also stacks up well against cards using the ATI Radeon X800 XT GPU. The BFG card represents the best bargain of the cards we tested, and it fits in most small PCs.
—*Dave Salvator*

eVGA e-GeForce 6800 Ultra

$499.99 list. Requires: 450W power supply; one AGP 2.0 slot; two Molex connectors; two slot widths. Warranty: 1 year with overnight replacement. eVGA.com Corp., www.evga.com

●●●●○

eVGA.com's newest high-end offering serves up nVidia's GeForce 6800 Ultra in a very fast and competitive card. Installation is straightforward, and eVGA.com includes an online utility called SysScan that helps locate potential problems.

Like all cards based on the GeForce 6800 Ultra, the eVGA e-GeForce 6800 Ultra requires two 12V hard-drive power connectors to feed the power-hungry graphics processor. Your PC should have a 450W power supply. The card has dual DVI outputs and arrives with two DVI-to-VGA converter dongles, giving you great flexibility in driving multiple displays. Also in the box is Far Cry, a visually impressive and fun 3D first-person-shooter game.

The eVGA card's performance is right up there with other GeForce 6800 Ultra–based cards. The difference on 3D GameGauge performance between the fastest and slowest card tested was only 4 to 5 percent, so none of these cards stood apart as the best performer. But the nVidia-based cards did run Doom 3 considerably faster than those based on the ATI X800 XT GPU. eVGA.com's card tied for first place in our Doom 3 testing.

The eVGA.com e-GeForce 6800 Ultra is a solid performer that will have you gaming in style now—and prepared for the games coming out later this year.—*DS*

PERFORMANCE TESTS

3D Graphics Cards: How Fast Are They?

Because we're testing high-end 3D graphics cards that target hard-core gamers, we're most interested in how the cards perform on 3D games. We started with two synthetic tests, 3DMark03 and AquaMark 3, both of which run a series of game-like 3D animation sequences to gauge GPU performance. Next we ran 3D GameGauge, our own suite of six Direct3D games—Splinter Cell, Microsoft Flight Simulator 2004, Halo, Far Cry, Painkiller, and Unreal Tournament 2004—and one OpenGL title, Doom 3.

We ran a test sequence in each of these seven games that results in an average frame rate. Usually, you want a game's frame rate to be about 60 frames per second (fps), though some games, such as flight simulators, run acceptably at 30 fps. We then take a geometric mean of the seven games' average frame rates to produce our final 3D GameGauge score.

We tested the cards at two different resolutions: 1,280 by 1,024 and 1,600 by 1,200. Our test systems included a 2.2-GHz Athlon 64 3400+, ASUS K8V motherboard (VIA K8T800 chipset), 2GB PC3200 DDR SDRAM, Sound Blaster Audigy 2 Platinum, and a Maxtor 250GB SATA hard disk, all running Windows XP Pro with SP1 and all updates installed, including DirectX 9.0b.

Because cards based on the same GPU performed nearly identically, we'll discuss performance differences between ATI- and nVidia-based cards in general.

3DMark03: Cards based on ATI's X800 XT GPU fare best here, though PNY's Verto 6800 Ultra gives them chase. 3DMark03 tests a variety of vertex and pixel shader performance, and the first of its four tests gauges DirectX 7–level performance. When we switch to the higher resolution, the scores flatten a bit, because all cards are now hitting the limit of their graphics memory bandwidth. But overall this race belongs to the ATI-based cards.

AquaMark3: nVidia- and ATI-based cards are more evenly matched here, with nVidia holding a slight advantage at the 1,280-by-1,024 resolution. But when we dial the resolution up to our higher setting, the ATI-based cards pull ahead.

3D GameGauge: nVidia-based cards are a hair faster at both test resolutions, but the margin separating the two is only about 5 percent. When we delve into the numbers more specifically, we see that nVidia-based cards are considerably faster at running Doom 3, id Software's latest 3D game. On the other hand, ATI holds the advantage on Far Cry, currently the most 3D-intensive Direct3D-based game.—*DS*

High scores are best. Bold type denotes first place.	1,280-BY-1,024 WITH 2X ANTI-ALIASING, 4X ANISOTROPIC FILTERING					1,600-BY-1,200 WITH 4X ANTI-ALIASING, 8X ANISOTROPIC FILTERING				
	3DMark03	AquaMark3 (fps)	3D GameGauge (fps)	Doom 3 (fps)	Far Cry (fps)	3DMark03	AquaMark3 (fps)	3D GameGauge (fps)	Doom 3 (fps)	Far Cry (fps)
ASUS AX800 XT	7795	52	56	52	68	4544	**42**	44	27	**44**
ASUS V9999 Ultra Deluxe	7065	52	58	65	62	4148	33	45	37	37
ATI Radeon X800 XT Platinum Edition	7799	52	56	52	**69**	**4551**	**42**	45	27	**44**
BFG GeForce 6800 GT OC	6250	51	56	64	54	3696	33	44	35	35
eVGA e-GeForce 6800 Ultra	6865	**55**	**59**	**70**	64	4053	36	**46**	**38**	39
Leadtek WinFast A400 Ultra	6582	53	57	67	60	3981	35	45	37	37
PNY Verto 6800 Ultra	7363	54	**59**	**70**	64	4303	35	**46**	**38**	38
Sapphire Radeon X800 XT	7801	52	56	52	68	4534	**42**	44	27	**44**
VisionTek Xtasy Radeon X800 XT Platinum Edition	**7815**	52	56	52	**69**	4525	**42**	44	27	**44**

RED denotes Editors' Choice.

Leadtek WinFast A400 Ultra TDH

$560 street. Requires: 450W power supply; one AGP 2.0 slot (two slot widths); two Molex power connectors. Warranty: 3 years. Leadtek, www.leadtek.com

●●●●◐

In a field crowded with nearly identical offerings, making one stand out is a challenge. Leadtek takes a solid GeForce 6800 Ultra-based card and sweetens the deal with two really good games—Splinter Cell: Pandora Tomorrow and Prince of Persia: The Sands of Time—and a beefed-up cooling system. The end result is a card that's ready to party right out of the box.

Installing the Leadtek WinFast A400 Ultra TDH is easy, but its cooling unit is bigger than most other cards, effectively eating up two PCI slots. You may need to move a PCI card down to another slot to accommodate the A400 Ultra, but that's about the only downside. The card has twin DVI outputs and comes with a single DVI-to-VGA dongle, video cabling, and a 12V power splitter.

The A400 Ultra ran about even with other GeForce 6800 Ultra–based cards. If you don't already have the two games that come with this card, this bundle saves you about $80 to $100, making the A400 Ultra a good value. The PNY card offers a better (lifetime) warranty, but Leadtek's warranty is good for three years. And did we mention the cool games?—*DS*

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With Microsoft Office Small Business Edition 2003: $1,789

ServicePac® Service Upgrade:[12]
2-yr Onsite Repair/9x5/Next Business Day Response #30L9189 **$197**

IBM ThinkPad T42

System Features:

- Intel Centrino Mobile Technology
  - Intel Pentium M Processor 735 (1.70GHz)
  - Intel PRO/Wireless Network Connection 802.11b/g
- Microsoft Windows XP Professional
- 14.1" XGA TFT display (1024x768)
- 32MB ATI Mobility RADEON 7500 graphics
- 256MB DDR SDRAM
- 40GB hard drive
- Integrated Gigabit Ethernet and modem
- IBM Ultrabay Slim CD-RW/DVD-ROM combo
- IBM UltraConnect Antenna for increased signal strength
- 1-yr system/battery limited warranty[8]

NavCode 2378FTU-M419

THINK EXPRESS MODEL PRICED AT: **$1,749**

With Microsoft Office Small Business Edition 2003: $1,989

ServicePac Service Upgrade:
4-yr Depot Repair #69P9195 **$249**

IBM ThinkPad T42

System Features:

- Intel Centrino Mobile Technology
  - Intel Pentium M Processor 1.50GHz
  - Intel PRO/Wireless Network Connection 802.11b/g
- Microsoft Windows XP Professional
- 15" XGA TFT display (1024x768)
- 32MB ATI Mobility RADEON 7500 graphics
- 256MB DDR SDRAM
- 40GB hard drive
- Integrated Gigabit Ethernet and modem
- Ultrabay Slim CD-RW/DVD-ROM Combo
- Only 1" thin, 5-lb travel weight
- 1-yr system/battery limited warranty[8]

NavCode 2378DWU-M419

THINK EXPRESS MODEL PRICED AT: **$1,649**

With Microsoft Office Small Business Edition 2003: $1,889

ServicePac Service Upgrade:
3-yr Depot Repair #30L9192 **$132**

IBM ThinkPad T42

System Features:

- Intel Centrino Mobile Technology
  - Intel Pentium M Processor 735 (1.70GHz)
  - Intel PRO/Wireless Network Connection 802.11b/g
- Microsoft Windows XP Professional
- 15" SXGA+ TFT display (1400x1050)
- 64MB ATI Mobility RADEON 9600 graphics
- 512MB DDR SDRAM
- 60GB hard drive (7200 RPM)
- Integrated Gigabit Ethernet and modem
- IBM Ultrabay Slim CD-RW/DVD-ROM combo
- IBM UltraConnect Antenna for increased signal strength
- 3-yr system/1-yr battery limited warranty[8]

NavCode 2379DXU-M419

THINK EXPRESS MODEL PRICED AT: **$2,399**

ServicePac Service Upgrade:
3-yr Onsite Repair/9x5/Next Business Day Response #30L9195 **$243**

IBM ThinkPad X40

IBM ThinkVantage Technologies:

- Longest standard battery life of any leading-brand notebook[13]

System Features:

- Intel Centrino Mobile Technology
  - Intel Pentium M Processor LV 1.20GHz
  - Intel PRO/Wireless Network Connection 802.11b
- Microsoft Windows XP Professional
- 12.1" XGA TFT display (1024x768)
- Intel Extreme Graphics 2
- 256MB DDR SDRAM
- 40GB hard drive
- Integrated Gigabit Ethernet and modem
- Legendary IBM fullsize keyboard[14]
- 7.5hr Li-Ion battery[15]
- 1-yr system/battery limited warranty[8]

NavCode 23866GU-M419

THINK EXPRESS MODEL PRICED AT: **$1,749**

ServicePac Service Upgrade:
3-yr Onsite Repair/9x5/Next Business Day Response #30L9195 **$243**

IBM ThinkPad X40 Solution Pack

IBM ThinkVantage Technologies:

- Longest standard battery life of any leading-brand notebook

System Features:

- Intel Centrino Mobile Technology
  - Intel Pentium M Processor LV 1.20GHz
  - Intel PRO/Wireless Network Connection 802.11b
- Microsoft Windows XP Professional
- 12.1" XGA TFT display (1024x768)
- 256MB DDR SDRAM
- 40GB hard drive
- Integrated Gigabit Ethernet and modem
- 7.5-hr Li-Ion battery
- 3-yr system/1-yr battery limited warranty[8]

Accessories Included:

- ThinkPad X4 UltraBase Dock
- IBM Ultrabay Slim CD-RW/DVD-ROM combo

NavCode 23826UU-M419

THINK EXPRESS MODEL PRICED AT: **$2,199**

ServicePac Service Upgrade:
5-yr Onsite Repair/9x5/Next Business Day Response #69P9200 **$449**

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IBM recommends Microsoft® Windows® XP Professional.

(Monitor not included)

(Monitor not included)

(Monitor not included)

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Only IBM offers these features to protect your users, connect them, and keep them working. Each ThinkCentre™ desktop featured here can give them the efficiency, productivity and edge they need with the following ThinkVantage Technologies:

NEW! Rescue and Recovery with Rapid Restore:

Lost your data because of a software crash or virus? Recover previously saved data in minutes with our one-button solution.

Access IBM:

Get the help you need, when you need it. One button on your ThinkCentre desktop brings you a world of resources and assistance.

ImageUltra™ Builder:

Need to roll out new systems? Image and copy your operating system across your network in a flash. (Order separately)

IBM ThinkCentre A50

System Features:

- Intel® Pentium® 4 Processor with HT Technology 3.0GHZ
- Microsoft Windows XP Professional
- 256MB DDR PC3200[9]
- 40GB hard drive • CD-ROM
- Integrated 10/100 Ethernet
- Norton AntiVirus™ with 90 days of virus definition updates
- Lotus® SmartSuite® Millennium license
- 1-yr parts limited warranty with 1-yr limited onsite service[17]

NavCode 814821U-M419

THINK EXPRESS MODEL PRICED AT: **$699**

IBM ThinkCentre A50

System Features:

- Intel Pentium 4 Processor with HT Technology 3.0GHz
- Microsoft Windows XP Professional
- Small form factor–62% smaller than a standard desktop[16]
- 256MB DDR PC2700
- 40GB hard drive • CD-ROM
- Integrated 10/100 Ethernet
- Norton AntiVirus with 90 days of virus definition updates
- Lotus SmartSuite Millennium license
- 3-yr parts limited warranty with 1-yr limited onsite service[17]

NavCode 841943U-M419

THINK EXPRESS MODEL PRICED AT: **$799**

ServicePac Service Upgrade:
4-yr Onsite Repair/9x5/Next Business Day Response #69P9158 **$198**

IBM ThinkCentre A50

System Features:

- Intel Pentium 4 Processor with HT Technology 3.0GHz
- Microsoft Windows XP Professional
- 256MB DDR PC3200
- 40GB hard drive • CR-RW
- Integrated 10/100 Ethernet
- Norton AntiVirus with 90 days of virus definition updates
- Lotus SmartSuite Millennium license
- 1-yr parts limited warranty with 1-yr limited onsite service[17]

NavCode 814822U-M419

THINK EXPRESS MODEL PRICED AT: **$749**

NEW! IBM ThinkCentre A50 Ultra small form factor

System Features:

- Intel Pentium 4 Processor with HT Technology 3.0GHz
- Microsoft Windows XP Professional
- Ultra small form factor–74% smaller than a standard desktop[16]
- 256MB DDR PC3200
- 40GB hard drive • DVD/CD-RW combo
- Norton AntiVirus with 90 days of virus definition updates
- Lotus SmartSuite Millennium license
- Integrated 10/100 Ethernet
- 1-yr parts limited warranty with 1-yr limited onsite service[17]

NavCode 809022U-M419

THINK EXPRESS MODEL PRICED AT: **$849**

With Microsoft Office Small Business Edition 2003: $1,089

ServicePac Service Upgrade:
4-yr Onsite/9x5/4-hr Response #69P9162 **$250**

NEW! IBM ThinkCentre A51p

System Features:

- Intel Pentium 4 Processor 530 with HT Technology
  - Processor speed 3.0GHz
  - 800MHz FSB
- Microsoft Windows XP Professional
- 512MB DDR2 PC3200
- 80GB hard drive • DVD/CD-RW combo
- Gigabit Ethernet-integrated
- 64MB ATI RADEON x300 Pro
- 1-yr parts limited warranty with 1-yr limited onsite service[17]

NavCode 842722U-M419

THINK EXPRESS MODEL PRICED AT: **$1,049**

With Microsoft Office Small Business Edition 2003: $1,289

ServicePac Service Upgrade:
3-yr Onsite/9x5/4-hr Response #41L2734 **$129**

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Belkin Components Universal Notebook Travel Surge Protector
#22P7127 **$20**

Targus Deluxe Mobile Essentials Kit
#22P7437 **$60**

ThinkPad Carrying Case™ – Leather Attache
#73P3600 **$129**

ThinkPad 72W AC/DC Combo Adapter
#22P9010 **$99**

ThinkPad Port Replicator II
#74P6733 **$179**

IBM ThinkCentre Accessories

IBM 128MB USB 2.0 High-Speed Memory Key
#22P9229 **$59**

Lexmark X5270 All-in-One Printer
#22P8808 **$140**

IBM ThinkVision™ L150 15" Flat Panel Monitor with system purchase
#W9SPAB1 **$379**

IBM

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Internet or telephone (toll charges may apply). **(10) Thinness:** may vary at certain points on the system. **(11) Travel weight:** includes battery and optional travel bezel instead of standard optical drive in Ultrabay bay, if applicable; weight may vary due to vendor components, manufacturing process and options. **(12) ServicePac services:** are available for machines normally used for business, professional or trade purposes, rather than personal, family or household purposes. Service period begins with the equipment date of purchase. Service levels are response-time objectives and are not guarantees. If the machine problem turns out to be a Customer Replaceable Unit (CRU), IBM will express ship the part to you for quick replacement. Onsite 24x7x2-hour service is not available in all locations. For ThinkPad notebooks requiring LCD or other component replacement, IBM may choose to perform service at the depot repair center. Calls must be received by 5pm local time in order to qualify for Next Business Day Service. **(13) Battery life:** Based on manufacturer's published figures or CNET.com results for the top 5 vendors in 2003 notebook sales based on IDC data, as of 1/29/2004. **(14) Full-size keyboard:** As defined by ISO/IEC 15412. **(15) Battery:** These model numbers achieved the Ziff Davis Media, Inc.'s Business Winstone® 2002 BatteryMark™ Version 1.0 Battery Rundown Time of at least the time shown. This test was performed without independent verification by the VeriTest testing division of Lionbridge Technologies, Inc. ("VeriTest") or Ziff Davis Media, Inc.; neither Ziff Davis Media, Inc., nor VeriTest makes any representations or warranties as to these test results. Winstone is a registered trademark and BatteryMark is a trademark of Ziff Davis Publishing Holdings, Inc., in the U.S. and other countries. A description of the environment under which the test was performed is available at ibm.com/pc/ww/thinkpad/batterylife. Battery life (and recharge times) will vary based on many factors including screen brightness, applications, features, power management, battery conditioning and other customer preferences. **(16) Size claims:** are based on a comparison of chassis volume to the volume of IBM's standard desktop chassis. **(17) Systems with limited onsite service:** are designed to be repaired during the applicable warranty period primarily with customer-replaceable parts provided by IBM. IBM will only send a technician onsite to perform a repair if (a) remote telephone diagnosis and/or customer part replacement are unable to resolve the problem, or (b) the part is one of the few designated by IBM for onsite replacement. For a list of onsite replaceable parts, contact IBM. Support unrelated to a warranty issue may be subject to additional charges. **(18) Certain IBM logo products:** are not manufactured, warranted or supported by IBM; IBM logos and trademarks used under license. Contact IBM for details Trademarks: The following are trademarks or registered trademarks of IBM Corporation: IBM, the IBM logo, ImageUltra, Lotus, NavCode, Rapid Restore, Rescue and Recovery, SmartSuite, ThinkCentre, ThinkPad, ThinkVantage, ThinkVision, UltraConnect, UltraBase, Ultrabay and UltraNav. Microsoft and Windows are registered trademarks of Microsoft Corporation. Intel, Intel Inside, Intel Inside logo, Intel Centrino, Intel Centrino logo, Intel SpeedStep and Pentium are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries. Other company, product and service names may be trademarks or service marks of other companies. © 2004 IBM Corporation. All rights reserved.

Visit www.ibm.com/pc/safecomputing periodically for the latest information on safe and effective computing.

PNY Verto 6800 Ultra

$499.99 direct. Requires: 450W power supply; one AGP 2.0 slot (two slot widths); two Molex connectors. Warranty: lifetime. PNY Technologies, www.pny.com

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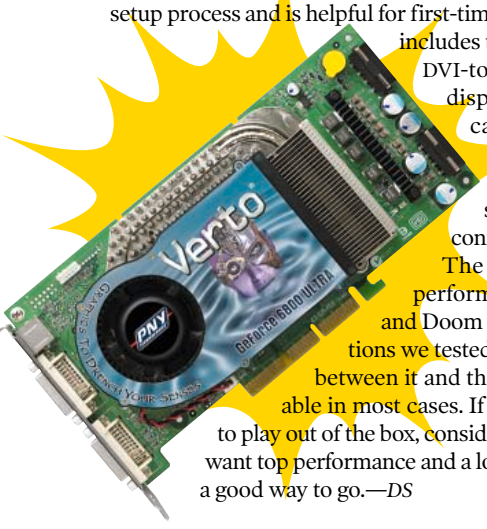
The PNY Verto GeForce 6800 Ultra was the fastest performer in our game tests, by the slightest of margins. Does that make it the one to buy? Not necessarily. The performance is certainly there, and so is a *lifetime* warranty. Though it comes with a free beverage cooler, you don't get a bundle of top games, as you do with some of the other graphics cards costing the same.

The 23-page installation guide takes you easily through the setup process and is helpful for first-time installers. The card also includes twin DVI outputs and two DVI-to-VGA dongles for multidisplay flexibility. Like most cards using the GeForce 6800 Ultra GPU, PNY's offering requires two slots and twin Molex 12V connectors to run optimally. The PNY Verto 6800 Ultra's performance on 3D GameGauge and Doom 3 was tops at both resolutions we tested at, though the difference between it and the others won't be noticeable in most cases. If you're looking for games to play out of the box, consider another card. But if you want top performance and a long-term warranty, PNY is a good way to go.—*DS*



Does PCI Express Matter?

Desktops are finally starting to ship with graphics cards based on PCI Express, the new interface designed to double the transfer rate of AGP 8X. PCI Express's other major advance is the ability to perform bidirectional transfers at the same speed. This means a graphics card can push information back to main memory as fast as it can receive it. AGP isn't good at sending data back to the system. This cool feature can allow a game to modify a texture and then send that texture data back to the system, which could in turn modify the game's environment.

But the rub is that no application today takes advantage of this bidirectional feature. So we're left with the old performance paradox: Does the increased transfer rate really make any difference? The short answer is: Not much, today. But that may change fairly soon. For example, the highest-quality mode of Doom 3 is supposed to require a 512MB graphics card, but no such card currently exists. The faster transfer rate of PCI Express may—and we stress, *may*—make this mode playable.

As more advanced titles ship in the next year, owners of PCI Express systems will benefit. Even those games will need to be backward-compatible with AGP-based systems, and it's not clear whether designing them specifically for PCI Express will be worth the extra effort. Another major issue is that hardware manufacturers are just starting to implement PCI Express. The only chipsets currently supporting it are Intel's 915P Express, 915G Express, and 925X Express. And PC makers are still tweaking the BIOSs of PCs supporting these chipsets.

Two years down the road, when most consumer systems are shipping with PCI Express graphics, all this will change. Once non-Intel chipset companies bring PCI Express to the AMD processor line, we'll see software developers taking advantage of the new standard in earnest.—*LC*

Sapphire Radeon X800 XT

$529 list. Requires: 350W power supply; one AGP 2.0 slot; one Molex connector. Warranty: 2 years. Sapphire, www.sapphiretech.com

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We weren't surprised when we opened the Sapphire Radeon X800 XT box to find what looks like a plain old ATI reference board. Like all the other X800 XT cards, the Sapphire card's performance is amazingly fast. So how does it stand out in a crowd? First, it has VIVO (video in, video out) capability. Like most X800 XT cards, it supports TV output, with component, S-Video, and composite cables in the box. But Sapphire adds video input with S-Video and composite support, letting you record and edit video.

The eight-page manual includes illustrations showing how to install the card and information on setting up drivers for Windows 98 and later. But you won't find anything about the video-in feature; the CD-based manual from ATI has this info.

The excellent game bundle also makes this card stand out. Sapphire includes its own Redline overclocking utility and PowerDVD 5, as well as two excellent recent games, Splinter Cell: Pandora Tomorrow and Prince of Persia: The Sands of Time. This would be a fantastic value if the package didn't cost more than competing cards. Sapphire also sells a "Lite" retail package without the software bundle for $30 less.—*JC*

VisionTek Xtasy Radeon X800 XT Platinum Edition

$499.99 direct. Requires: 350W power supply; one AGP 2.0 slot; one Molex connector. Warranty: lifetime. VisionTek, www.visiontek.com

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The VisionTek Xtasy Radeon X800 XT Platinum Edition card was one of the first to reach the market, so it's not surprising to see that it sticks directly to the ATI reference design. It has no flashing lights or special heat sinks. In fact, the VisionTek sticker on the center of the fan is the only tip-off that it's not ATI's product. But you will find one major difference: Like Sapphire's board, the Radeon X800 includes an ATI Rage Theater chip that enables video capture. In addition to the standard DVI-to-VGA adapter and composite, component, and S-Video output cables, the Radeon X800 comes with a video input cable that accepts S-Video or composite video input.

Printed documentation for the card consists of a single glossy sheet listing steps for hardware and software installation. An extensive PDF manual is online. Like all of these top-level cards, the Radeon X800 delivers awesome performance. The software bundle leaves something to be desired, though. You don't get much in the way of software, just the necessary drivers and PowerStrip 3.5, an overclocking utility. The VisionTek Xtasy Radeon X800 XT is a reasonable buy, but better values are available.—*JC*

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BEEF UP your browser

By Cade Metz Illustration by Mark Matcho

Browsers are puny research tools; here's how to turn yours into a powerhouse.

Sixty-three million Americans use the Internet for academic research, and nearly as many use it for work-related research, says a study by the Pew Internet & American Life Project. Among experienced computer users, according to the UCLA Center for Communication Policy, the Internet now ranks as more important than television, radio, magazines, newspapers, and even books as an information source. Too bad the browsers they use to gather their information are such weak research tools.

As you surf, finding what you're looking for is painfully time-consuming. As good as Google and Yahoo! are, you'll soon wish they were better for serious research.

Once you find what you seek, your browser doesn't give you a useful way of stashing it away for future use. You can use your Favorites menu to bookmark the page, but the next time you visit, the site may have changed or moved, and that important piece of information may be lost.

If you're one of the millions of Americans who do research on the Web, it's high time you beefed up your browser with an add-on utility that's more adept at finding and organizing online data. No, we don't mean the toolbars offered by most search engine companies. Most are browser enhancements, and they'll save researchers a mouse click here and there, but they won't help you trudge through results; they won't even begin to organize your online data.

You need one of the utilities reviewed here, each specifically designed for Microsoft Internet Explorer. We also include a look at *PC Magazine*'s own utility, Web Historian, another useful tool for aiding your browser's long-term memory.

In the late nineties, the Web was crawling with nifty utilities like Netonizer and SurfSave, which improved the way your browser searched and stored information, but most had questionable business models and disappeared with the bursting of the Internet bubble. Lately, however, there's been a resurgence of polished browser add-ons, with several hitting the market within just a few months.

"Entrepreneurs who made a name for themselves in the early days of the Internet realize that this [the inadequacy of browsers] is still a problem, and they're now coming back to solve it," says Chris Shipley, a technology analyst who runs the DEMO conferences, where many of these new utilities have been launched. "These people know the industry, and they know the limitations of the browser, and they're trying to do something about it." For example, J. J. Allaire, creator of the Web application server ColdFusion (acquired by Macromedia), is now chairman and CEO of Onfolio, which offers a Web research utility of the same name. And Andrew Busey, developer of Apple's iChat client, has resurfaced with a utility called Pluck.

Some, like BIGontheNet's p-ZOOM, help search for information. Others, like Onfolio, help store and organize it. Still more, like Pluck, do both. Many also help you share this information. Onfolio, for instance, lets you build slick HTML reports. No two utilities work the same way, but each enhances your browser, helping it do things it can't do on its own.

Unlike the old breed of Internet utilities, most of these tools will cost you a few dollars. Amplify and Pluck, however, are still free. But even if you have to pay, you won't be sorry: When you're doing research online, your browser alone doesn't cut it.

IN THIS STORY

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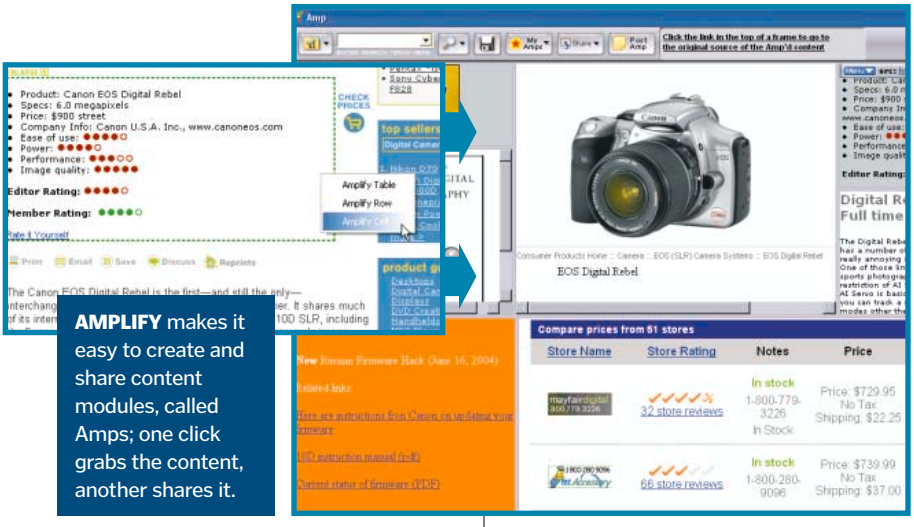

AMPLIFY makes it easy to create and share content modules, called Amps; one click grabs the content, another shares it.

Amplify

Free. Amplify LLC, www.amplify.com.

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With Amplify you can easily collect relevant parts of your favorite Web pages, reach your collections from any computer, and share them with friends or communities of Amplify users. To start, Amplify gathers and saves portions of selected Web pages in collections called Amps. Amps are stored online, so you can access them from any computer and share them with others, whether or not they have Amplify installed. The toolbar also offers advanced search capabilities and a pop-up blocker.

A new Amp is a blank window with up to four resizable frames. You can split any frame horizontally or vertically to make more. Each Amp can hold up to 100KB of content, so watch the size indicator at the bottom right. Note that you can't save if the Amplify server is temporarily down (which happened at one point during our testing).

After you click on the Amplify button, you'll see a yellow dotted rectangle around images, blocks of text, and other page elements that Amplify can grab with a single click. Tables get a green border and special handling—you can grab the whole table, the current cell, or the current row (but not the current column). We particularly like the fact that you can see in advance exactly what portion of the page you'll collect. After clicking on the item, you select an Amp and save the element in any empty frame. Each frame links back to the page it came from. You can also add a formatted comment in any empty frame or right-click on the highlighted part of a page and choose "Add to Amp."

A very few pages, such as Travelocity's main page, use unusual HTML code or style sheets that defeat Amplify. But on the whole, we are impressed with Amplify's flexibility. Since audio and video files normally open within your media player rather than in a browser, Amplify handles them by listing any audio/video links on the current page in a special menu from which you can capture them. You won't want more than one audio file per Amp, as they'll play at the same time.

One click submits a completed Amp for sharing at *www.amplify.com*. The toolbar's search box lets you search the community's Amps or your own. It also offers a multiengine Web search that strives for the most relevant results, as well as news, shopping, and other category-specific searches.

The program's user interface is slick, but it's not perfect. The attractive buttons don't respond to the Enter key. You can't simply save an open Amp using its current name; you must always respond to a dialog box. And rearranging existing Amp elements is awkward.

Amplify's methods for capturing Web content are top-notch, and its online community is a valuable asset. The handy yellow and green outlines let you know exactly what you're getting, and the program even captures difficult elements like audio and video. Add bonus features like targeted Web search and pop-up blocking and you've got a great solution for gathering and sharing online data.—*Neil J. Rubenking*

blinkx

Free. blinkx, www.blinkx.com.

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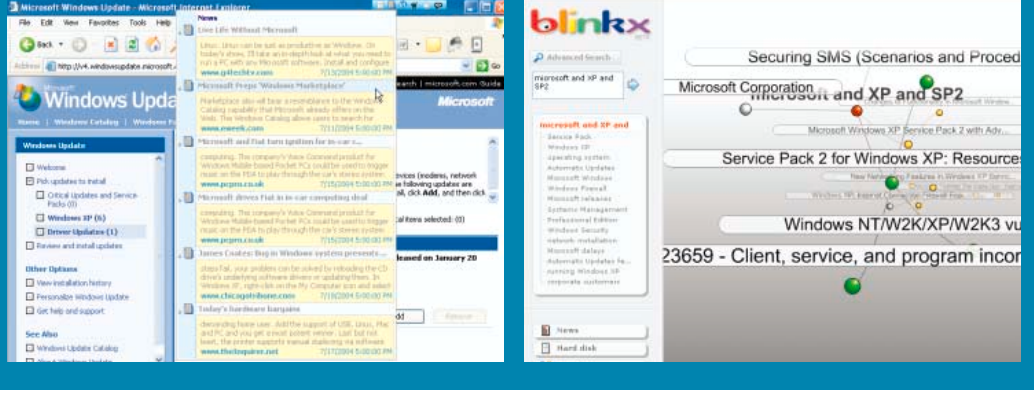
With blinkx you don't need to burn brain cells finding the perfect combination of search keywords. As you view a document or Web page, blinkx locates related pages, blogs, news feeds, products, local documents, and video feeds. You can search these resources directly by entering a query locally, or you can use the broadband-only visual search on blinkx's Web site. The product requires Windows 2000 or XP.

Locally, blinkx indexes over 300 file formats as well as e-mail in Outlook, Outlook Express, and Eudora. By default it indexes only files in your My Documents folder, though you can add other folders. Because blinkx won't index an entire hard drive, we couldn't properly compare its speed or index size with search tools we've previously reviewed, like X1 or Creo Six Degrees. The initial indexing pass can take all night; a Fast Indexing option speeds it up at the expense of other processes. We encountered one oddity: It doesn't break words at periods, so a search on "pcmag" would not find a document containing "pcmag.com".

When you open a document, Web page,



BLINKX shows you local documents (it recognizes over 300 file formats) and a wide variety of online information related to whatever you're currently looking at; the 3D Visualizer can help you see the connections between pieces of information.

or e-mail, a toolbar in the title bar of the window shows a dim icon for each of the six categories (Web pages, blogs, news feeds, products, local documents, and video feeds). As blinkx locates content in each area, the corresponding icon blinks on. Clicking on it brings up links to the top items, with previews. If you highlight a paragraph or portion of the document, blinkx seeks matches for just that portion. With 60 million Web pages indexed so far, blinkx has a long way to go to catch up with Google's 4 billion pages.

You can also double-click on blinkx's toolbar icon to perform a keyword search. It supports quoted phrases and the AND operator, and it can select specific document types or fields. It searches while you type, updating its results with each character, so on slower machines you may need to wait for blinkx to catch up. When you mouse over a search result, a small preview pane slides out. You can also click on an icon to jump to the Web-based blinkx search. The Web-based blinkx (*http://search.blinkx.com/BlinkxBroadband/*) is still in beta. It searches the Web, news feeds, BBC video feeds, and (if you have the blinkx installed) your hard drive.

The 3D Visualizer option, accessible from the online search or via the Viz button in blinkx, provides a unique way to surf related pages. It starts with a handful of nodes springing out from the search term. You can move and rotate this model using the mouse, hover over a node for a preview, or click on a button to expand a node with more connections. Even better, if you drag one unexpanded node onto another, it'll find pages related to both.

Not every user is a trained taxonomist who can always choose the right keywords. blinkx offers something unique in its "searchless search." We expect the rough edges to wear away quickly, and it will become steadily more useful as its Web index grows.—*NJR*

enLighter Retriever

$14.95 direct. N-Liter Inc., www.n-liter.com.

●●●●○

Remember the joys of studying from textbooks? You could emphasize passages with a yellow highlighter, make notes in the margins with a ballpoint pen, or turn down the corners of pages so you could return to them quickly when cramming for exams. Wouldn't it be nice if you could do the same while surfing the Web? You can, with enLighter Retriever, a browser toolbar available for just under $15.

On the surface, enLighter resembles popular search toolbars offered by portals like Google, MSN, and Yahoo!. It adds a thin strip of tools to your browser, including a text-entry box that lets you swiftly search the Web for keywords and phrases. When you first install the app, it's set up to search Google's Web index, but you can reset it to query any one of 14 other search engines, including AOL, MSN, and Yahoo!.

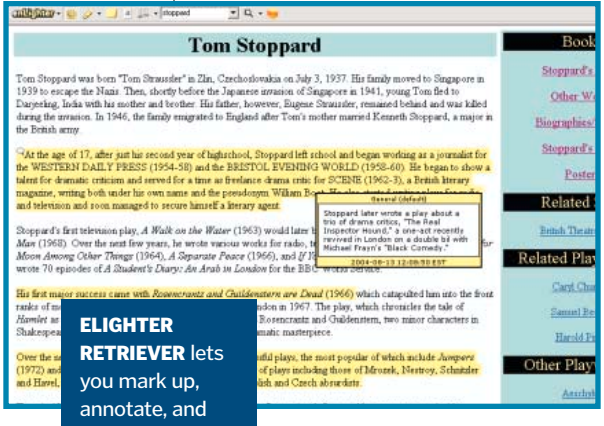
The real beauty of the app is what you're able to do once your search is complete, which comes remarkably close to mimicking your old study habits. You can highlight any amount of text you like and add comments to those passages. You can also save pages to your hard drive, annotations and all, for easy access.

To highlight text, simply select it with your mouse and click on a button in the enLighter toolbar; you can also use the app's Sticky Button tool, which automatically highlights selected text in any one of four colors: yellow (default), red, blue, or pink.

If you highlight a block of text and click on a second toolbar button, a small window pops open, letting you input a few comments about the passage. From then on, when you mouse over the highlighted text, your comments will reappear—along with the day and time you typed them. You can also number your comments as you would footnotes.

Once you're done annotating a page, you can send it off as an e-mail attachment or save it to the local enLighter library. Whenever you like, you can open the library within your Web browser and revisit the page, complete with your highlights and comments. You can peruse the list of pages you've saved, or you can quickly search for pages by entering a keyword or phrase. You can even search for keywords typed into your comment windows.

Other toolbars let you highlight Web pages, but they don't let you annotate, save, and retrieve pages as easily as enLighter Retriever. If you do a great deal of Web research, this utility is certainly worth its modest price.—*Cade Metz*



ELIGHTER RETRIEVER lets you mark up, annotate, and footnote documents on the Web in much the same way you'd do to textbooks.

Onfolio

$29.95 direct. Onfolio Inc., www.onfolio.com.

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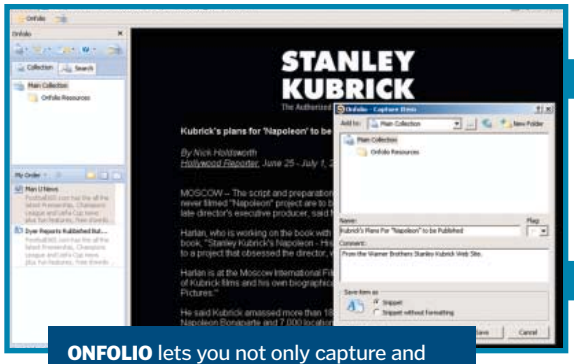
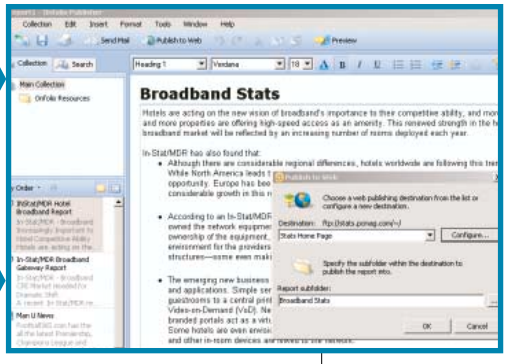
If you're a putting together a term paper, you'll be pleased with enLighter Retriever. But if you're gathering information for professional colleagues or clients, you'll want something potent—something that carefully arranges and formats your re-

Amplify enLighter Retriever Onfolio Professional

PC MAGAZINE EDITORS' CHOICE

Which of our tools is right for your browser depends on your needs. Casual researchers who want to attack the Web the way they used to go after their college textbooks will appreciate enLighter Retriever, which lets them approximate the experience of marking up a book, complete with virtual highlighters and notes in the margins, at a very reasonable price. More serious professional researchers, especially those who need to gather their work for presentations, will like the greater flexibility and power of Onfolio, which helps you organize and publish your work. And if you want to share what you've found, Amplify is a cool way to centralize your favorite links, replacing your Favorites folder with much cleverer Amps—collections of links that you can access via the Web and share with others.





ONFOLIO lets you not only capture and annotate information, but also quickly and easily publish it to HTML reports.

search, like Onfolio. This recent PC *Magazine* Editors' Choice is better at organizing all the juicy bits of data you track down on the Web, and with its built-in publisher, you can easily distribute your data in slick electronic reports.

Onfolio is also more expensive than the $15 enLighter. The standard edition, which lacks the built-in publisher, costs $29.95, and the professional edition is $79.95. We recommend the professional version—the strength of the app lies mostly in its publisher—but you can upgrade from standard to professional at any time.

Onfolio isn't a search tool. It merely helps you organize and publish the online data you've already found. Whereas enLighter adds a search box to the top of your browser, letting you quickly query Web indexes like Google and Yahoo!, Onfolio adds nothing more than a pair of buttons.

When you click on the Onfolio button, a pane pops up on the left side of the browser, much like the one that appears when you click on Internet Explorer's Search button. This pane, the Collection Explorer, is the guts of the app. It organizes a library of nested Windows folders where you can store online data, including text, photos, links, and entire Web pages.

The second button is used to capture data. When you click on it, a dialog box pops up, giving you the option of storing either a link to the current page or the page itself. You can label the page however you like and add your own comments. You can also save individual pieces of a page by highlighting the portion you wish to save and clicking on the Capture button.

Once data is saved, you can do a number of things with it. With the Onfolio Deskbar, a free-floating version of the Collection Explorer, you can drag and drop items into Microsoft Office applications. And with the Onfolio Publisher, another standalone application, you can easily organize data into simple, attractive HTML reports. Again, you simply drag and drop items from your Onfolio library. Onfolio lets you add rich text and graphics, and once your report is finished, Onfolio helps you quickly e-mail it to colleagues and clients or post it on the Web.

Onfolio is spread across many windows: the Collection Explorer, the Deskbar, and the Publisher. This is a strength and a weakness. The app is very versatile, and if you want certain tools out of the way, they can be. For students or casual users, it may be too much. But for businesspeople, it's just right.—*Alfred Poor and Cade Metz*

Pluck 0.9.5

Free. Pluck Corp., www.pluck.com.

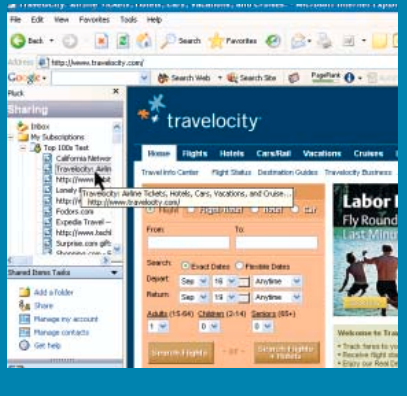
●●●●○

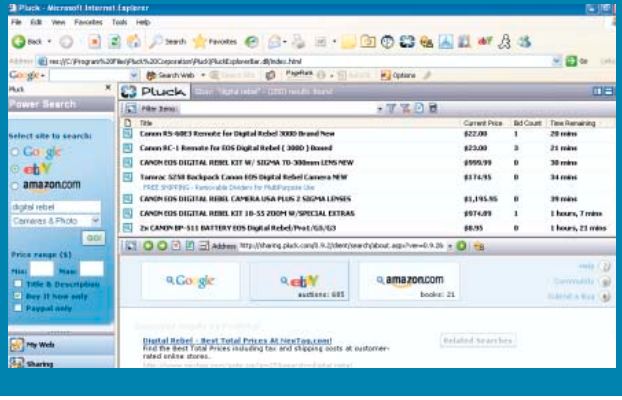
Pluck helps you find and organize Web pages and make them available from any computer; you can select pieces of your collection to share with others as well. It's also a full-scale RSS (Rich Site Summary) news reader with impressive searching abilities. This free tool—a publicly available beta—is quite powerful, but is still hampered by minor usability issues.

Pluck's heart is page aggregation and sharing. When you load the app, it offers to import existing Favorites into its online collection—a simple (if slow) process. A toolbar button displays the Pluck sidebar on the left. Pluck doesn't try to make off-line copies of favorite pages. Rather, it makes links to them available from any computer.

As you surf, you add new favorites to personal folders within Pluck instead of Internet Explorer's Favorites. Clicking a button "plucks" the current page, or you can right-click and choose "Pluck this page." We found, though, that if you click on the button before the page has completely loaded, Pluck won't capture the page title. It also doesn't remember the most recently used folder, so when gathering a number of related pages, you must reselect the folder for each. Conveniently, any highlighted text on the page becomes that page's comment.

When you pluck an item, you can edit its title and add a comment, then save it in a personal or shared folder or e-mail it. Shared folders are collections you create with the intention of inviting others to "subscribe" to them. Pluck users you invite are notified within Pluck, while others get an e-mail invitation with the option to install the app. Once users begin sharing a folder, they see any new item you add right away and can also add to the shared folder.





PLUCK makes your favorites list available from any computer that's online and lets you share parts of your collection as well. The PowerSearch feature combs a variety of sites, from news pages to eBay, with search refinements for each type.

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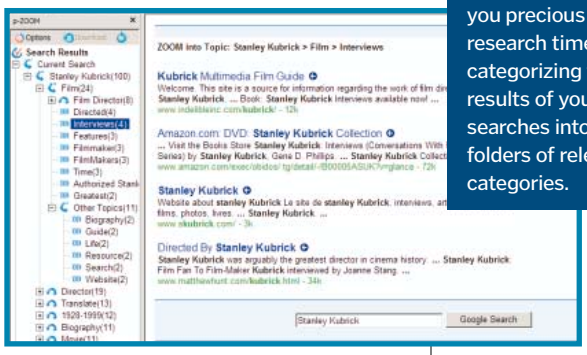


p-ZOOM saves you precious research time by categorizing the results of your searches into folders of relevant categories.

Pluck's Power Search feature is impressive. You start by choosing a search type—Amazon.com, Google, eBay, news sites, or your own plucked pages and comments. Each type gets specific additional refinements—for example, eBay searches can include a price range and be ordered by price or auction timing. Clicking on Search pulls up a standard list of results, with a preview pane to show the selected item.

Better still, clicking on "Create Perch" saves the search and causes Pluck to repeat it at preset intervals, alerting you to any new results. The intervals are fixed—3 hours for news, 4 for eBay, 8 for Amazon.com, and 24 for Google. You can, however, refresh the search manually at any time. Although the searches don't cost you anything, Pluck gets a kickback from the Web sites when you purchase via these links.

Pluck also functions as an RSS news reader. It comes with a lengthy list of feeds in various categories and a link to search for more. You can also just drag a site's RSS icon into Pluck. You can share your selected RSS feeds with others, just as you share Web pages.

The optional Pluck toolbar can search the Web or your plucked pages and comments. It provides quick access to RSS feeds or your favorite Web folders, and it makes adding the current page to a favorite folder simple.

We especially like Pluck's Power Search feature and the included full-scale RSS reader. Pluck does a lot for a free tool, and we have high hopes for the 1.0 version. —*NJR*

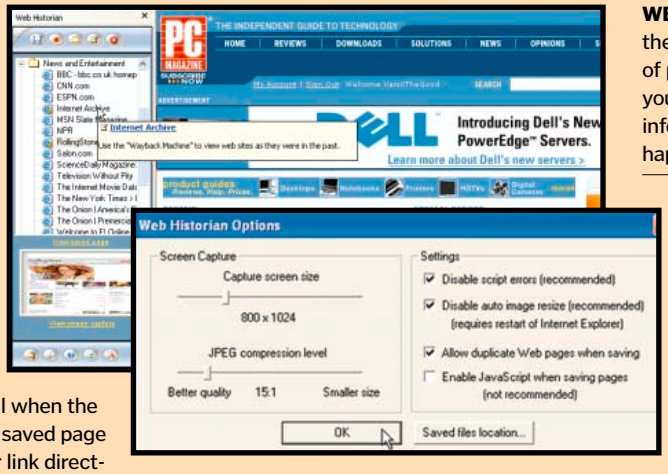
p-ZOOM

$39.90 direct. BIGontheNet Pte Ltd., www.zoomstation.com. ●●●○○

Tired of hunting through pages and pages of search results, trying to find that one useful site amid all the garbage? With p-ZOOM, a $40 browser add-on, you can sidestep a great deal of this tedious process. When you type a keyword or phrase into one of the leading search engines, p-ZOOM sorts the results into a series of relevant categories, making it much easier to find what you're seeking.

When you visit Google and search on "Stanley Kubrick," for instance, p-ZOOM sorts Google's results into ten major categories, ranging from Film and DVD to Biography. Clicking on a category reveals

Our Back Pages: Web Historian 1.0



WEB HISTORIAN gives you the ability to save snapshots of pages to make sure that you always have access to the information no matter what happens on the site.

PC *Magazine*'s own Web Historian 1.0 is a boon for Web-based research and page recording. It's not in contention for an Editors' Choice since it's ours. But if we do say so ourselves, we think it stands up to the competition quite well—especially at its price.

Like the other tools here, Web Historian works with IE. Clicking on the Save button makes a permanent record of the current page in the active Web Historian folder. The program also saves a JPEG snapshot that appears as a thumbnail when the page is selected. You can browse the saved page off-line, view the image at full size, or link directly to the actual page, and you can quickly search all saved pages.

The handy Record mode automatically collects every page you visit. It made short work of saving our Top 100 Web sites. Some extra pages did turn up from sites that use redirection or have an initial full-page ad; but deleting them was simple. Web Historian makes its own HTTP request to the server after the page has completely loaded, so the page it saves may differ slightly from what you see. One site caused a bit of trouble: Visiting *www.hotmail.com* with Record mode active generated an item titled "Please sign in," showing a blank preview image. Clicking on the "View saved page" link sent IE into an endless loop. Still, ordinary users are unlikely to save this page.

Web Historian saves pages in the format IE calls "Web archive, single file." It can't save pages whose display is controlled by Flash, ActiveX, or a Java applet. If the page in question is frame-based, Web Historian will save the base URL, not necessarily the frame you're currently viewing. A sure sign of this type of page is when clicking on a link displays new content without changing the URL in the address bar.

You can control the compression level of the JPEG page images. We selected 15 percent compression, a value that yields decent images. Our 100 test sites occupied a hefty 36MB on disk, including about 20MB of images. At highest compression, those images would probably take up 2MB. You can add a note of up to 512 characters, which displays as a ToolTip when the mouse points to it. Right-clicking on a saved page lets you e-mail that page, the JPEG image, or a link to the original page.

Web Historian won't do everything. It doesn't store your data online or offer sharing other than via e-mail. And it doesn't check for updates of saved pages. But it does a fine job of making off-line copies of specific pages or of all the pages you visit.—*NJR*

$5.97 direct, free with utility subscription. Ziff Davis Media Inc., www.pcmag.com. Not rated.

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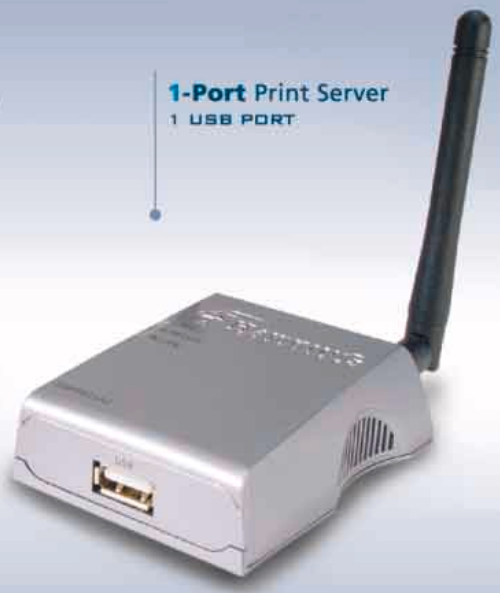

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WEDGRABIT can take your daily reads and turn them into a single desktop newspaper—as long as there aren't too many of them.

subcategories, which reveal further subcategories, and so on.

p-ZOOM creates its nested folders on the fly, using information gleaned from site titles and synopses generated by the search engine. The categories aren't always as relevant, as well organized, or as self-explanatory as they could be, but depending on what you're searching for, the app can certainly cut down on the number of links you have to look through.

The process is reminiscent of Groxis's Grokker, a standalone metasearch tool. But whereas Grokker organizes its nested categories within a graphical interface, laying them out like dollops of paint on a palette, p-ZOOM uses an ordinary Windows tree structure. You navigate through the hierarchy of categories much as you would in Windows Explorer.

Installing p-ZOOM adds a single button to the top of your Web browser. When you click on the button, a new pane appears on the left side of the browser, much like in Onfolio. If you then visit Google, MSN, or Yahoo! and type in a keyword, p-ZOOM automatically sorts the search results and displays the hierarchy of categories in the extra pane.

Once you find a subcategory you'd like to explore, you can select it with your mouse, and all the links within that subcategory will appear in the main body of the browser. You can also save your searches and return to them anytime you like. You simply save the hierarchy of nested categories, or you can download and save the actual Web pages within those categories.

The rub is that p-ZOOM requires a hefty amount of processing power. The company says you'll need at least a Pentium III processor and 128MB of RAM. On a Pentium III with 192MB of RAM, p-ZOOM took only a few seconds to generate a list of results

If you've got the right hardware, p-ZOOM is worth the price. It's a good way to cure those Google blues.—*CM*

WebGrabit 1.20

$24.95 direct. Fast Scout Ltd., www.webgrabit.com.

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Fast Scout's WebGrabit 1.20 saves chunks from your favorite pages and automatically notifies you when the content changes. It's like being able to make any page into a personal RSS feed. We like the concept and much of the implementation, but we wish the app could handle more content without affecting system performance.

With WebGrabit, you can choose to place items on the desktop or leave them as floating windows. The utility relies on the Active Desktop, a feature of Windows Me, 2000, and XP that can also be added to Windows 98 and NT 4.0. We gathered elements like breaking news and stock charts—anything with changing content. We also added a number of actual RSS feeds.

To collect information you simply highlight it, right-click, and choose "WebGrabit—Grab Content." Unlike Amplify, though, it doesn't outline the portion of the page it will capture. WebGrabit reads the Document Object Model description of the Web page and expands the selection into a complete page element. If you select text in a paragraph, it might pull in the entire paragraph. A list item might expand to the entire list. In a few cases we couldn't grab less than the entire page, but the app generally chose well. By default, the title for the grabbed item is the page's title; you can edit this as you please.

To grab a site's RSS feed, you right-click the RSS icon or link and choose "WebGrabit—Grab RSS." A script error results if you choose this option after right-clicking anything but an RSS link. Unlike Pluck, WebGrabit provides neither a default list of RSS feeds nor the ability to search for feeds.

WebGrabit provides an item preview formatted with the style of the page that contains it. This can result in black-on-black or other problems, but a custom page-settings option restores readability. You can choose to update the page after a specified number of days, hours, or minutes, with or without notification of changes. Internet Explorer's cache can interfere with the update process; the company recommends setting IE not to use cached pages.

Updating a portfolio chart might require logging on to your broker's Web site. In this situation, you highlight the log-on elements, right-click, and choose "WebGrabit—Grab Login." WebGrabit identifies the elements that handle the log-on and records them, along with your user name and password.

Items can be hidden, optionally popping up when content changes. They can also be set to be always on top and transparent, or they can be pinned to the desktop so they don't obscure your work.

WebGrabit, however, isn't designed to handle a large number of items. There's no provision for organizing items into folders or for sorting them. Checking for updates brought the system (an 800-MHz Pentium III) to a crawl, using over 90 percent of CPU resources. Tech support recommended keeping the list down to 50 items. When we pared it down to 10, deleting the unwanted items took nearly 5 minutes. Even after this, the system seemed unstable during updates. More than once we had to restart to regain control.

If you track 10 or 15 news elements, WebGrabit can turn your desktop into a personal newspaper. But it won't handle the number of items a dedicated RSS newsreader can; when you add too many, the system slows down and may even become unstable.—*NJR*

MORE on the web

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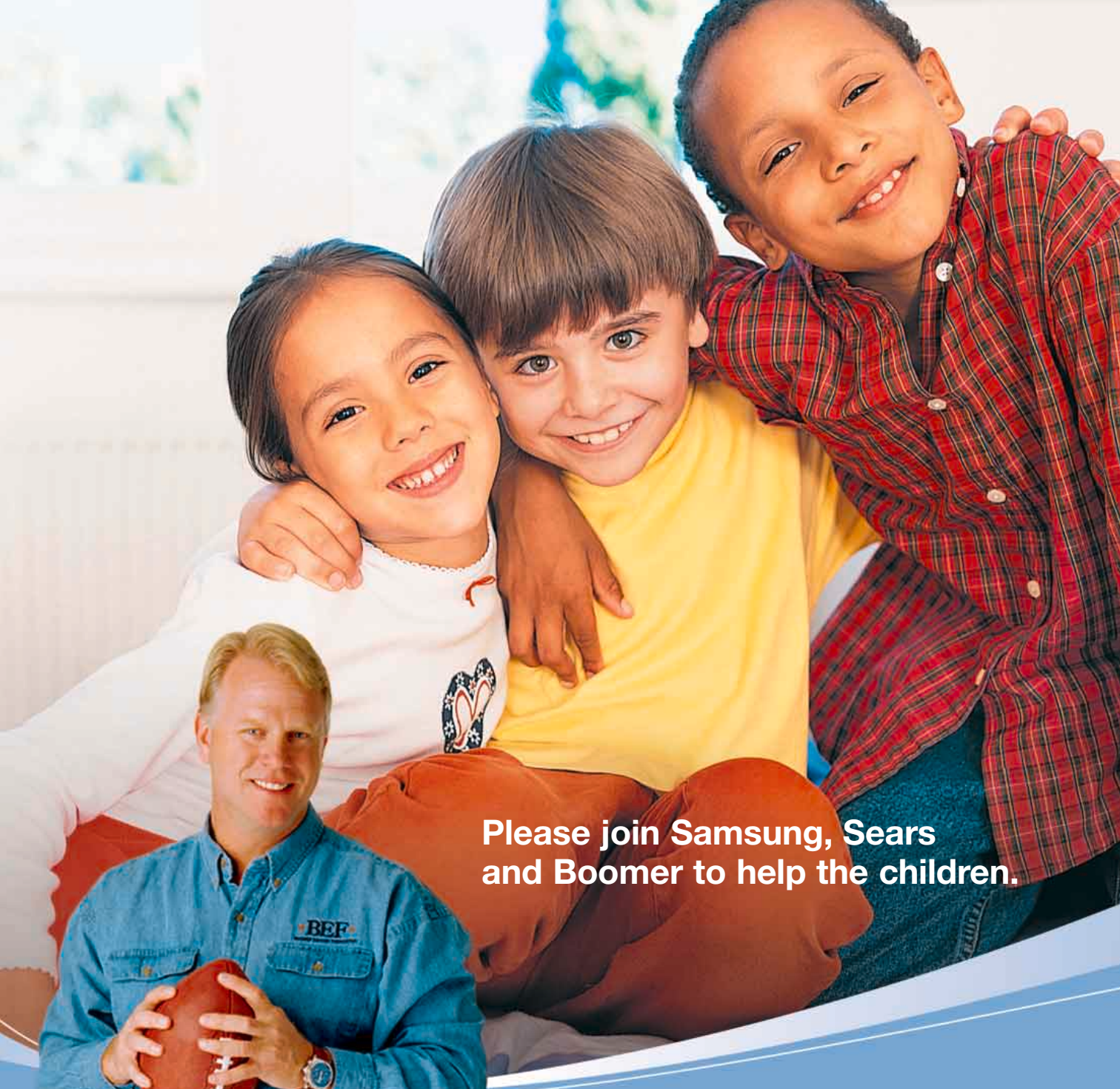
OUR CONTRIBUTORS: Cade Metz is a senior writer at *PC Magazine*. **Alfred Poor** is a contributing editor. Associate editor **Sean Carroll** and lead analyst **Neil J. Rubenking** were in charge of this story.



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Michael J. Miller
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Dear Valued Subscriber,
For over 20 years, *PC Magazine* has assisted subscribers like you in selecting the right technologies and products. Now, we have developed a series of workshops, uniquely tailored for the *PC Magazine* subscriber. Our upcoming *PC Magazine* event, called Digital U, is a group of full-day workshops designed to help you get the most of the digital electronics that are transforming how we deal with photographs, videos, and our everyday computing experience.

I have assembled an elite team of editors, including Bill Howard, Jan Ozer, and Sally and Daniel Grotta to provide hands-on instruction and to share useful tips, advice and insight that will increase your expertise.

During Digital U, these editors will be conducting three workshops focusing on: digital photography, digital video and the connected home. Depending on which workshop you attend, you'll get expert instruction on techniques that the professionals use, including: capturing the sharpest picture, producing the best video and designing the ultimate digital home. For more details on each workshop, please see complete descriptions inside.

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Jan Ozer

Jan Ozer has worked in digital video since 1990 and joined *PC Magazine* as a contributing editor in 1996. Since then, Jan has written eight books on digital video, including the *PC Magazine Guide to Digital Video* (John Wiley, 2003). Jan has also instructed two and three day video production seminars since 1993.

What You'll Learn

- **9:00–9:45 Registration**

- **10:00–11:15 Selecting Your Camcorder**
  1. Setting your budget
  2. Features that Matter
     1. Number of CCDs
     2. Audio inputs
  3. Features to ignore
     1. Digital zoom
     2. Digital effects
  4. Inside a PC Magazine DV camera review (how we compare cameras)
     1. Resolution
     2. Color accuracy
     3. Audio quality
     4. Talking head quality
     5. Action quality
  5. When to consider other formats (DVD/MPEG-4/Flash memory)

- **11:15–11:30 Coffee break provided in Digital U Tradezone**

- **11:30–12:45 Shooting for Watchability**
  1. What is watchable—the basics
     1. Proper framing
     2. Stable picture
     3. Appropriate use of motion
     4. Frequent change
  2. What is watchable—advanced
     1. Telling a story with video
     2. Shooting cutaways
     3. Shot combinations
  3. Capturing good audio
     1. Why camcorder microphones perform poorly
     2. Inexpensive alternatives for improving audio quality
  4. Lighting the scene
     1. Why camcorders perform poorly in low light
     2. Inexpensive lighting alternatives
  5. Using your camera
     1. Setting white balance
     2. Choosing programmed exposure settings
     3. When to go manual focus

- **12:45–1:45 Lunch provided in Digital U Tradezone**

- **1:45–3:00 Editing for Watchability**
  1. What is watchable—the basics for editing
     1. Frequent change
     2. Appropriate use of transitions and effects
     3. Pacing with titles
     4. Background audio and narration
  2. Choosing your editor
     1. Setting your budget
     2. When to step up a level
  3. The editing workflow
     1. Capture
     2. Trimming
     3. Sequencing
     4. Adding transitions and effects
     5. Adding titles
     6. Working with background music
     7. Final output
  4. Working with digital pictures
     1. Creating slideshows
     2. Adding transitions
     3. Pans and Zooms
  5. Advanced topics
     1. Color correction
     2. Motion stabilization

- **3:00–3:15 Coffee break provided in Digital U Tradezone**

- **3:15–4:00 DVD Authoring**
  1. DVD Basics
     1. Terminology
     2. Standards
     3. Content sources
     4. Navigation options
  2. Choosing your DVD authoring program
     1. Setting your budget
     2. When to step up a level
  3. Choosing your DVD recorder
     1. Standards
     2. Single vs. dual layer
  4. The authoring workflow
     1. Preparing your assets (video and slide shows)
     2. Building your menus
     3. Linking menus to assets
     4. Preview
     5. Render
  5. Converting tapes to DVDs
     1. Issues
     2. Capacity
     3. Navigability
     4. Conversion time
     5. Alternatives
     6. Consumer electronics devices
     7. Hybrid capture devices and DVD recorders
     8. Computer plus DVD recorder

- **4:00–5:00 Meet the Editors**

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Sally Wiener Grotta

Sally Wiener Grotta, an award-winning writer and expert in digital imaging software and digital photography, writes for top consumer, computer and photography magazines.

Daniel Grotta

Daniel Grotta, president of DigitalBenchmarks, has written or co-authored four high-tech books, including *PC Magazine's Guide to Digital Photography*.

What You'll Learn

- **9:00–9:45 Registration**

- **10:00–11:15 Understanding Your Digital Camera**
  1. How a digital camera works
  2. How digital technology affects the kinds of pictures you can get
  3. Selecting the right digital camera for you
  4. Just what are megapixels and why should you care?
  5. Other considerations when choosing a camera
  6. Gaining familiarity with the controls, features and functions of your digital camera
  7. Getting your pictures out of the camera and into the computer

- **11:15–11:30 Coffee break provided in Digital U Tradezone**

- **11:30–12:45 Using your digital camera beyond basic point-and-shoot**
  1. How techniques & technologies translate into great pictures
  2. Getting exposure right and using exposure controls for better composition
  3. f-stops and shutter speeds
  4. Bracketing
  5. Metering modes
  6. Program modes
  7. Understanding how different white balance settings will affect your photography
  8. Controlling & adding light
  9. Advanced focusing techniques
  10. Color modes & models
  11. Understanding which file formats are appropriate for what kinds of pictures and projects
  12. When, how and why to use file compression

- **12:45–1:45 Lunch provided in Digital U Tradezone**

- **1:45–3:00 Tips & Techniques for Efficient and Effective Digital Photography**
  1. Avoiding shutter lag and click-to-click delays
  2. Strategies for extending battery power and memory capacity
  3. Delete, protect & format
  4. Improving your pictures with software (correcting exposure, color, sharpness and redeye)

- **3:00–3:15 Coffee break provided in Digital U Tradezone**

- **3:15–4:00 Using & Sharing Your Digital Photos**
  1. Preparing your pictures for print, email or other purposes
  2. Using photos in personal and professional projects
  3. Getting great prints from your desktop printer, photo kiosk, retail shops and online print services
  4. Sharing your photos via email and on the Web
  5. Organizing, managing and archiving your digital photo library

- **4:00–5:00 Meet the Editors**

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Bill Howard
Bill Howard is a contributing editor and columnist for *PC Magazine* and technology consultant and speaker. His On Technology column covers new developments, Internet hardware, PCs, notebooks, telematics, wireless communications, and ease-of-use. His articles on PCs, portable computers and printers have been cited five times in the annual Computer Press Association Awards. He is a frequent commentator covering industry issues on TV news and business shows, as well as at industry conventions.

What You'll Learn

- **9:00–9:45 Registration**

- **10:00–11:15 The Connected Home**
  1. ABCs of networking
  2. Internet, entertainment, even automation and security
  3. Choosing products for today and the future
  4. Basics of a home network (all you need to know, but no more)
  5. The networking gear you'll need
  6. What to look for in a PC and notebook
  7. Wired vs. wireless
  8. Choices in broadband: cable modem, DSL

- **11:15–11:30 Coffee break provided in Digital U Tradezone**

- **11:30–12:45 Wireless Networking**
  1. Understanding WiFi's alphabet soup of choices: A, B, G
  2. Creating a wireless network from scratch
  3. Adding wireless to an existing network
  4. Difficult situations: the big house, the detached garage, crowded apartment buildings
  5. Access in airports, coffee shops, hotels
  6. Connecting wireless PCs to the Internet

- **12:45–1:45 Lunch provided in Digital U Tradezone**

- **1:45–3:00 Beyond Internet-Connection Sharing**
  1. Sharing files
  2. Sharing printers
  3. Digital media hubs: Sharing photos, music, even videos
  4. Windows Media Center PCs and future devices
  5. Video across the Web
  6. Voice Over IP: Your next long-distance carrier?
  7. Connecting to the office from home
  8. Home automation, remote monitoring: No longer for geeks only?

- **3:00–3:15 Coffee break provided in Digital U Tradezone**

- **3:15–4:00 Safe at Home: Security**
  1. Securing a wireless network: step by step
  2. Preventing viruses, worms, Trojan horses
  3. Mom and Dad as network manager: Keeping the kids safe
  4. Sharing access to parts of your PC
  5. Access for visitors and guests
  6. Easy, hassle-free backup strategies
  7. What to back up

- **4:00–5:00 Meet the Editors**

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BUSINESS IT: Rent OR BUY?

ILLUSTRATIONS BY DAN PAGE

Many companies are outsourcing IT duties to third parties and reaping benefits.

BY JOHN CLYMAN

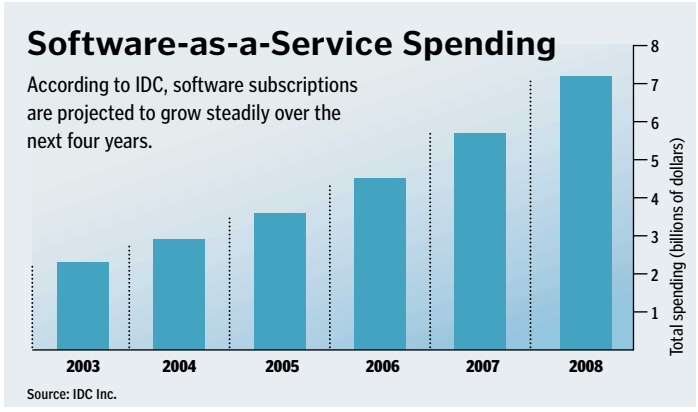
When you need a place to live, you've got plenty of options to choose from. You could build a home from scratch to your exact specifications—and wait a year or more until it's ready. Or, you could rent an apartment, reducing your up-front capital expenses, lead time, and maintenance responsibilities in exchange for reduced flexibility and control over the particulars of your abode.

Enterprise applications come with a similar range of choices. Over the past decade, most enterprise investments followed the do-it-yourself model: Put foundational infrastructure in place, purchase software licenses, pay third-party consultants to perform extensive customization, and then maintain it all. But increasingly, companies are turning to application outsourcing as an alternative. Outsourcing promises benefits like reduced risk, lower capital and maintenance costs, improved responsiveness, and simplified deployment. It also helps eliminate overcapacity and provides affordable access to best-of-breed capabilities.

Whether you're subscribing to Web-based applications, on-demand services like those popularized by Salesforce.com, or utility computing infrastructures such as those promoted by IBM and Sun Microsystems, there are countless variations on the outsourcing theme: renting software instead of buying it. All offer new ways of letting companies balance their internal and external IT investments to meet their business requirements.

As a technology or business manager, how can you cut

through the hype to tell whether and where application outsourcing might be right for your organization? And what caveats should you keep in mind?



PUTTING OUTSOURCING IN PERSPECTIVE

The term *outsourcing* carries a potentially confusing variety of connotations. One outsourcing mechanism in particular—offshoring software development projects to India or other countries where highly skilled labor is available at low cost—has received extensive attention and sparked relentless controversy. But that's hardly all that outsourcing entails.

In the most general sense, the decision to outsource is just a variation on the make-versus-buy question that managers confront constantly. For any given business function, does it make more sense to allocate capital and deploy staff internally? Or would the company be better off acquiring it from an external source?

Even outside the technology space, the balance has changed radically over time. A century ago, vertical integration was considered essential in many industries; Ford Motor Co. owned rubber plantations in Brazil to provide the raw materials for manufacturing tires for its vehicles. Today, the notion of maintaining such peripheral capabilities seems almost comical: better to delegate the responsibility to specialized suppliers with the requisite expertise, as is common when companies hand off payroll processing to service providers like ADP.

Outsourcing within the IT world isn't a new phenomenon, either; mainframe time-sharing systems date back to the 1960s. More recently, Web hosting and colocation have become so commonplace that they're passé. But lately, the idea of migrating significant applications from an in-house data center into the hands of a third-party provider has gained appeal.

It's still a small market, totaling around $2.3 billion worldwide in 2003, according to Amy Konary, director of pricing, licensing, and delivery at research firm IDC. That's tiny compared with packaged software sales, which are estimated at about $200 billion. But it's also growing at a rapid 25 percent annual rate, leading Konary to project that spending will reach $7.2 billion in 2008. And perhaps most important: Even if the size of the market is small, the potential benefits to companies that embrace outsourcing are large.

PROBLEMS WITH ENTERPRISE APPLICATIONS TODAY

IT organizations face several problems that outsourcing addresses. Expense is the first: Enterprise IT is costly, not just in hardware purchases and software licensing costs but in maintenance, support, and staffing—all the factors that are rolled up into the so-called TCO (total cost of ownership).

The expense is exacerbated by the necessity to overinvest in the data center to accommodate peak CPU, storage, and bandwidth needs that may be reached only infrequently. (Having a fixed infrastructure also gets in the way when your operation exceeds capacity. How do you add further capacity in a pinch?) Additionally, those investments often require significant up-front capital expenditures that must be depreciated over an extended period, not expensed as they occur.

Beyond the direct costs, there's also the challenge of finding and retaining highly skilled IT staff for niche needs. Maybe you're a Windows shop that needs occasional Unix expertise, for example. Or you need to support legacy applications but no longer have the domain knowledge in-house. Perhaps you want to tap the best-of-breed experts in a particular field.

Implementing enterprise applications takes time, too, and the risk of failure is significant. Additionally, rapid changes in technology can make maintenance an ongoing hassle and slow a company's ability to adapt to new conditions. For nontechnology companies in particular, the reality may also be that IT, though important, is not a crucial competitive differentiator.

Smaller operations have even more basic problems. With an IT staff of one or two and a budget already stretched to the limit for maintaining network connectivity and databases, where do you turn for additional resources?

With these problems in mind, major consulting operations like IBM Global Services, EDS, and Accenture regularly ink multibillion-dollar deals in which they outsource entire divisions of large enterprises. But not all outsourcing efforts have to be so grandiose. On a smaller scale, a variety of providers let companies rent, in effect, items such as computing capacity, applications, or services on a pay-as-you-go basis.

Unraveling the available options can be confusing. Part of the problem is that the basic terminology is far from standardized. Here are some of the terms that occur frequently, and the contexts in which they appear.

Utility computing. A utility is a commodity that's available as needed via a standardized interface. You can plug any appliance into any electrical outlet, more or less, and get access to the power supply. Utility computing aims to make computational, network, and storage resources available on demand. Sun Microsystems' N1 software, for example, "virtualizes" several physically distinct machines so that they behave as a single resource.

Other companies, such as EMC, HP, IBM, Verari, and Veritas offer similar capabilities. Utility computing may be appropriate for custom or customized

> Your goal should be to delegate a function, not abandon responsibility.

OUR CONTRIBUTORS: John Clyman is a consultant and contributing editor of *PC Magazine*. **Cade Metz** is a senior writer, and **Molly K. McLaughlin** is an intern. PC Magazine Labs lead analyst **Sahil Gambhir** and associate editor **Michael J. Steinhart** were in charge of this story.

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applications of the sort that you might otherwise run in-house.

The sources of a true utility product would be fungible—you don't know or care which power plant generated the electricity you consume—though no IT utility today yet approaches that ideal. It's not particularly in a vendor's interest to commoditize its own products to such an extreme.

Grid computing. The term *grid* applied originally to the large arrays of comparatively cheap commodity processor subsystems used in some supercomputer designs, as well as to the loose confederation of machines whose spare CPU cycles are harnessed by distributed-processing projects, like the SETI@Home initiative. Now, though, grid computing is sometimes used as a rough synonym for utility computing.

On-demand. Often used to describe hosted software, the term *on-demand* is particularly prevalent in the CRM (customer relationship management) market, where companies like NetSuite, Salesforce.com, and SalesNet offer Web-native approaches, unlike more traditional client-server implementations. (For a comparison of leading on-demand CRM products, see "CRM on Demand: Have It Your Way," First Looks, July, page 62.)

However, the term *on-demand* has a second meaning, closer to that implied by utility computing. As Dean Douglas, vice president of IBM Global Services puts it, "On-demand is about having the capability—tech infrastructure, software, et cetera—available as you require it."

Application service provider (ASP). ASPs are, loosely speaking, companies that host software and make it available remotely. They can be further divided into two subcategories: those that host packaged applications that could be installed in-house (like mail servers or accounting applications), and those with Web-native applications like on-demand CRM.

Managed service provider (MSP). As a subset of the application service provider category, MSPs typically offer network management and monitoring services. Managed security service providers offer services such as intrusion detection, perimeter antivirus filtering, and managed firewall support.

Software as a service and pay-as-you-go IT. These are variations of the on-demand and ASP theme of subscribing to software. Software as a service sometimes carries the further connotation that functionality is exposed as a collection of Web services components. In this way, companies like Amazon.com and Google, both of which publish Web services APIs (application programming interfaces), could even be said to provide a limited form of free software-as-a-service infrastructure.

Amazon's API, for example, lets developers access catalog data and manipulate shopping carts using REST (Representational State Transfer) or SOAP (Simple Object Access Protocol) queries—essentially exposing Amazon functionality via Web services for anyone's use. Google's API, which is currently limited to noncommercial use, provides an interface to Google's search results, page cache, and spell-checking engine.

Although Web companies like these are

10 TIPS for Outsourcing Apps

1] **Define your expectations.** Outsourcing applications isn't just a trend—it has real benefits if you map out your objectives clearly. View outsourcing as a business solution to augment your current operations and create efficiencies, not as a rip-and-replace technology. Translate your expectations into financial terms, then calculate the savings in reduced cost and complexity or better time to market.

2] **Be realistic.** Web-based apps may not have interfaces as smooth or customization options as plentiful as those of desktop applications. Can you live with the level of support provided? Figure out your workflow requirements and move forward when you find an app that addresses them all.

3] **Assess yourself.** Quantify your baseline bandwidth, storage, and reliability requirements and usage. A hosted service can offset the costs of underutilized resources. Establishing that you're rarely hitting peak usage levels will go a long way in determining whether you'll achieve benefits from flexible hosted services.

4] **Identify your strengths and weaknesses.** Can you isolate the highest-impact but lowest-risk projects in your operation? This will help you determine which noncore lines of business are best suited for outsourcing.

5] **Follow the money.** Make sure that a subscription fee is cheaper than traditional software. Get your finance gurus to come up with valuation metrics and fiscal models that will quantify your current payment model compared with that of a hosted service. Also take into account your current infrastructure, maintenance, administration, and upgrade costs, and compare them against the cost of migration and subscription fees.

6] **Do your due diligence.** Just because you go the hosted route doesn't necessarily mean that all vendors will have identical service delivery formats and infrastructure requirements. Consider a third-party audit, which should include security of transactions and data. Evaluate the vendor's experience, technical expertise, and scalability options.

7] **Plan migration paths.** Have a path for data migration and integration with other systems from the start and a plan for termination. This will help avoid locking into a single vendor.

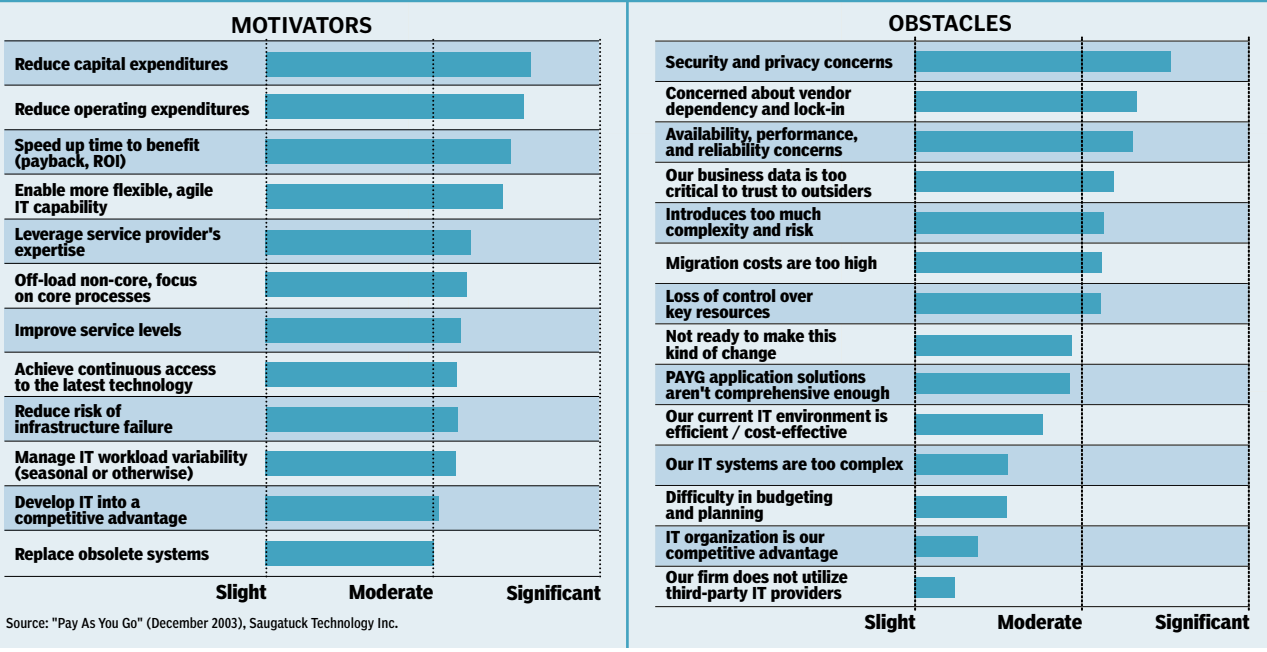
8] **Involve your legal team.** Make sure a lawyer is on board to review the licensing issues and intellectual property rights. Legal representation will also be of value during contract negotiations.

9] **Control your services.** Assign yearly budgets and resources. Establish ongoing ROI and performance metrics to determine whether the service achieves efficiencies. Apply the same disciplines of management to your other internal resources as you do for your hosted services.

10] **Maintain open communication.** Keep everyone apprised of goals and listen to their concerns. In this way, you will build trust and ease the cultural migration to hosted services. Keep in mind that your provider and its reps are now an integral part of your business, so treat them as members of your team.—*Sahil Gambhir*

Outsourcing Motivators and Obstacles

In a survey of more than 300 businesses, Saugatuck Technology asked which concerns were significant motivators and obstacles to outsourcing. Respondents rated each item on a scale of 1 (not a motivator/obstacle) through 5 (critical motivator/obstacle). The bar length represents each item's mean score.



Source: "Pay As You Go" (December 2003), Saugatuck Technology Inc.

best known for being destinations in their own right, some analysts think that someday such companies may be well positioned to provide broad software-as-a-service capabilities. Could Google's Gmail, for example, be an opening salvo, just the first of many on-demand applications that the company might ultimately launch?

Regardless of the terminology used, it's clear that a wide variety of capabilities are amenable to outsourcing. Bill McNee, founder and CEO of Saugatuck Technology (a Westport, Connecticut–based research firm) believes that the applications most likely to be outsourced in the near future are those "where configuration can meet your needs, rather than tremendous amounts of customization."

The most popular applications under consideration today are those that manage personnel and finance-related issues: benefits and personnel administration, travel services, payment processing, payroll, and the like. CRM, SFA (sales-force automation), ERP (enterprise resource planning), and customer service applications are much lower on the scale, even though CRM has probably the highest profile.

BENEFITS OF OUTSOURCED APPLICATIONS

The most obvious factor driving outsourcing is its potential for reducing costs. Infrastructure overcapacity is a big problem: Saugatuck's research indicates that many businesses have 50 percent or more surplus IT capacity that remains unused most of the time. Economy of scale is another advantage that outsourcers offer: A data center serving 100 different customers is likely to cost less per customer than would 100 separate data centers, each serving a single customer. The economy of scale is further visible in outsourced environments that implement multitenant architectures, where multiple users are each sharing private instances of a single application.

And yes, fundamental cost structures are a factor as well: Labor rates, real estate expenses, and taxes may be substantially lower in out-of-the-way geographic locations. (There's a reason that Silicon Valley companies locate call centers in places like Nebraska—or India—rather than in the hugely expensive local market.)

If you're using a Web-native application, there's an additional benefit: All you need is a Web browser to access the application, which means no specialized client software to install. Furthermore, updates to the application are automatic; there's no need to push a new client out to dozens or hundreds of machines. Although browser-based applications typically haven't offered the rich user experience of native GUI applications, companies are getting better at using JavaScript and dynamic HTML to enhance the richness of Web applications with features such as drag-and-drop. Security across the wire is usually provided via SSL support already built into browsers.

A downside of Web-based applications is that you can't use them off-line. Many vendors therefore provide some kind of off-line client software as an alternative access mechanism. But in our experience, these don't usually offer the full range of features available in the online application.

Whereas traditional CRM applications often entail extensive customization—to the extent that some analysts recommend budgeting $3 in consulting and services for every $1 in licensing fees—on-demand applications typically work off a prebuilt foundation that can be configured more than customized. Yet companies like Salesforce.com are beginning to reset the customizability goalposts with user-extensible data schemas, sophisticated multilanguage support, and full-blown APIs. In fact, Salesforce.com CEO Marc Benioff claims, "We don't make a CRM app any more, we make a tool" that lets companies create whatever database-driven application they want.

Yet the fact that many outsourced applications do provide so many capabilities on top of multitenant architectures means that they offer the advantage of rapid provisioning of new services, so companies' IT

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CASE STUDY: Unishippers' Savings Plan

When Unishippers set up a suite of applications to track billing and customer activity across its nearly 300 shipping offices nationwide, the Salt Lake City–based company never even considered hosting the software on its own. It just didn't have the human resources or the expertise needed to maintain these apps and the massive amounts of hardware they run on.

"We'd have to hire a whole new staff to work almost around the clock," says Kevin Lathrop, chief information officer at Unishippers, a 1,200-employee company that helps roughly 60,000 small and medium-size businesses ship packages around the globe. "We'd need network engineering support, system administration support, database support, a 24/7 help desk, and alert support, and those were things we really didn't want to deal with."

Rather than hire as many as five extra employees and pay them to work through the night, Unishippers outsourced the job to IBM Global Services. Big Blue hosts the company's application suite at a facility in Boulder, Colorado, handling most of the hardware and software maintenance.

Last year, IBM racked up over a billion dollars in revenue hosting applications on behalf of its customers. It has partnerships with a wide range of popular software manufacturers, offering clients more than 50 common enterprise apps, including everything from large-scale CRM tools to relatively simple human resources software. And clients are free to choose among different types of outsourcing.

"IBM is uniquely positioned in the marketplace," says Bill McNee, founder and CEO of Saugatuck Technology, a Westport, Connecticut–based research firm. "They not only do old-fashioned application outsourcing, where you take title to a software license and the software runs on their servers, they also do on-demand access, where IBM holds the title to the license and provides access to many different companies at once."

One of IBM's more prominent software partners is Siebel, a leading CRM vendor. Unishippers chose Siebel to track activity across its many shipping offices.

IBM hosts Siebel in two different ways. One option, *Siebel CRM OnDemand*, lets you tap into a Siebel service running on a preconfigured pool of servers.

The Siebel on-demand service is particularly inexpensive and easy to set up. According to Mike Riegel, director of markets and strategy for IBM OnDemand, you can sign up and log on to the service within 10 minutes, paying $70 per seat per month—but it allows for only limited customization. Unishippers wanted complete freedom to tailor the application to its particular needs, so it chose the more traditional option, *IBM Application Hosting for Siebel Systems.*

IBM installed the software on redundant sets of servers in Boulder, and Unishippers customized it simply by sending IBM a series of Siebel Repository Files (SRFs) from Salt Lake City. IBM even agreed to host a billing application Unishippers had built to run in tandem with Siebel.

Unishippers employees access this suite of apps from any Web browser, and the company never has to worry about upkeep on any of the hardware or software outsourced to IBM. "If there's any hardware or operating system failure or any issue with Siebel, it's IBM's job to detect it and get on it right away," says Lathrop. "All we have to do is monitor our custom billing application."

One problem arose during the first few months after installation: IBM's monitoring wasn't as diligent as it could have been. "Oftentimes, our users detected system downtime that wasn't detected by IBM. It happened on 10 to 12 occasions, and that was a big problem for us," Lathrop reported. IBM did improve its monitoring diligence after Lathrop complained.

Lathrop and his team feel a similar sense of powerlessness when they want to make changes to the suite. "You can't just 'cowboy it.' You can't just jump in and change things," Lathrop adds. "IBM has a very rigorous, well-documented process you have to go through, and it can take a while."

Yet despite these drawbacks, he's never second-guessed the decision to outsource. IBM proved responsive to his feedback, and in the end, Lathrop feels that IBM's policy on software changes is a good thing. "If you want to make a small change and you know it's the right thing to do, that slow process can get in your way," he says. "But just as often, by going through this careful process, you'll realize a change is the wrong thing to do and you won't make it."

Unishippers won't say how much it's paying to outsource the suite, but according to IBM, a setup like this typically costs 20 to 30 percent less than installing and managing the apps in-house. "Due to economies of scale and economies of skill," says IBM's Riegel, "we can manage the software much more cost-effectively." And then there are the five extra IT employees Unishippers didn't have to hire. It's no wonder the company opted for outsourcing.—*Cade Metz*

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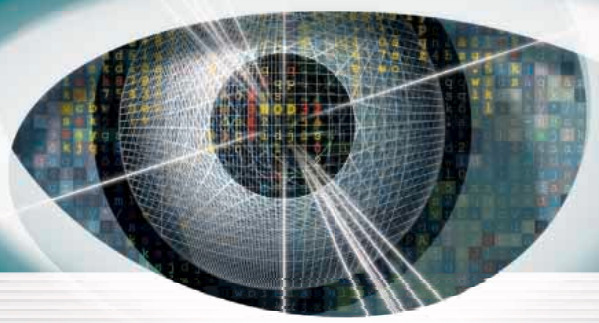

detection rate

performance index*

Windows 2000 Advanced Server

100% detection	Eset NOD32
missed 17	NAI NetShield
missed 26	Symantec

Windows XP Windows NT

100% detection	Eset NOD32
missed 50	NAI Virus Scan
missed 28	Symantec

* Total number of misses in all test sets in both on-demand and on-access scanning (not to scale).

Information source: ***Virus Bulletin June 2002 through June 2004***

scanning rate

megabytes/second*

Windows 2000 Advanced Server

28.804	Eset NOD32
11.204	NAI NetShield
8.976	Symantec

Windows XP Windows NT

59.416	Eset NOD32
21.683	NAI VirusScan
16.123	Symantec

* Scanning rate refers to throughput required to test executable files

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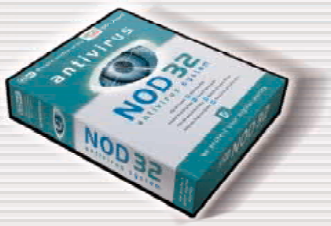

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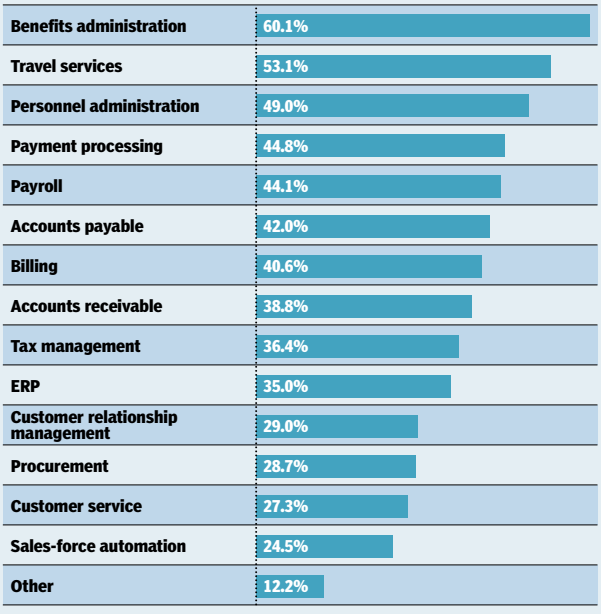
departments can become more nimble. The model also reduces risk. Companies purchasing outsourced services don't need to worry about the capacity of the infrastructure and what to do if demand varies dramatically. Nor do they need to devote resources to managing internal staff.

Application outsourcing may thus hold particular appeal for small and midmarket companies—those with a few dozen to a few hundred employees. Such companies often need complex, robust IT systems but don't have the deep enterprise IT resources and expertise that larger companies can apply to the problem.

But the appeal of application outsourcing undoubtedly extends to both much smaller and much larger businesses as well. Many vendors offer small-scale versions of their products with low monthly per-seat pricing, so you pay only for what you use. At the top end, in terms of the scope and the costs of outsourcing agreements, the sky's the limit.

Which Tasks Would You Outsource?

In a survey of 286 business of various sizes, Saugatuck Technology asked which of the following tasks the respondent would consider outsourcing. Multiple answers were allowed.



Source: "Pay As You Go" (December, 2003), Saugatuck Technology Inc.

RISKS AND CHALLENGES

Experts say that cost savings loom large when companies are considering outsourcing and urge them to beware of making decisions solely on the basis of cost. Control issues certainly merit major consideration. Another company is going to be responsible for your critical business systems; are you willing to trust it? Can it deliver the features, performance, security, support, and disaster resilience and recovery that you demand? Will the company be in business five years from now, or could it leave you stranded?

Application outsourcers live and die by their reputation for reliability, security, and data integrity, so those that persist are likely to get it right. But don't let that be a substitute for doing your own due diligence. Similarly, chances are good that you'll want an SLA (service level agreement) that spells out the kind of performance, availability, and support you can expect. In fact, companies such as PremiTech provide tools to help measure and report on application responsiveness so you can verify that hosts are in compliance with your SLAs.

When evaluating application outsourcing, be sure to consider your transition plan: How you'll migrate data into the new system, test it, and train staff. Don't forget to think about what happens when your outsourcing arrangement ends, either. What are your options for renewal? How will you be able to extract your data if and when you select a different provider? Vendor lock-in, in other words, should be at least as much a concern here as it would be for internal systems.

Think how your outsourced application will integrate with your other business systems and particularly with other apps you might outsource—perhaps to different partners—in the future. Today, interoperability between outsourced applications is likely to be somewhat limited, though the spread of Web service architectures should improve the possibilities over time.

And don't forget the human angle: the impact that outsourcing may have on your company's people. Employees are likely to be wary that outsourcing will mean lost jobs. Executives may be resistant to the perceived loss of institutional power if their staff or budget is cut dramatically.

Rather than simply jump on the latest bandwagon, it's important to clarify your business rationale for outsourcing. As Ian Dix, senior vice president of marketing at the outsourcing company Virtela, explains, outsourcing "has gotten so much attention that companies are doing it simply because they believe their competitors are doing it—and they're not doing the hard-core analysis, asking what are we trying to achieve by doing this."

It's similarly important to make sure you have a strong relationship with your outsourcing partner and the people to manage the process; the goal should be delegation of a function, not dereliction of responsibility. IDC's Konary says, "When people think about outsourcing, they think they're just going to hand [things] over to someone and not have to think about it anymore." This is a big oversimplification, especially for larger, more complex outsourcing deals.

WHAT THE FUTURE HOLDS

With companies increasingly seeking to maximize their IT return on investment and focus on core competencies, a continued migration to IT and application outsourcing seems almost certain. We're sure to see new types of applications being offered in hosted environments, as well as new challenges—and new innovations—in areas such as metering and billing, interoperability, and management.

Salesforce.com's Benioff likes to forecast the end of software as we know it—a day that's still far off, if it arrives at all. It's easy to see typical database-driven, client-server-style business applications moving to an on-demand model, but it's harder to imagine something like content creation following the same path: Can you imagine Adobe Photoshop as a Web app?

History shows us that the incredible proliferation of the PC did not spell the end of mainframe software, although the PC unequivocally stole the spotlight. Still, for many types of business software, the on-demand model is sure to grow in appeal. And even today, it offers advantages that make it well worth your consideration.

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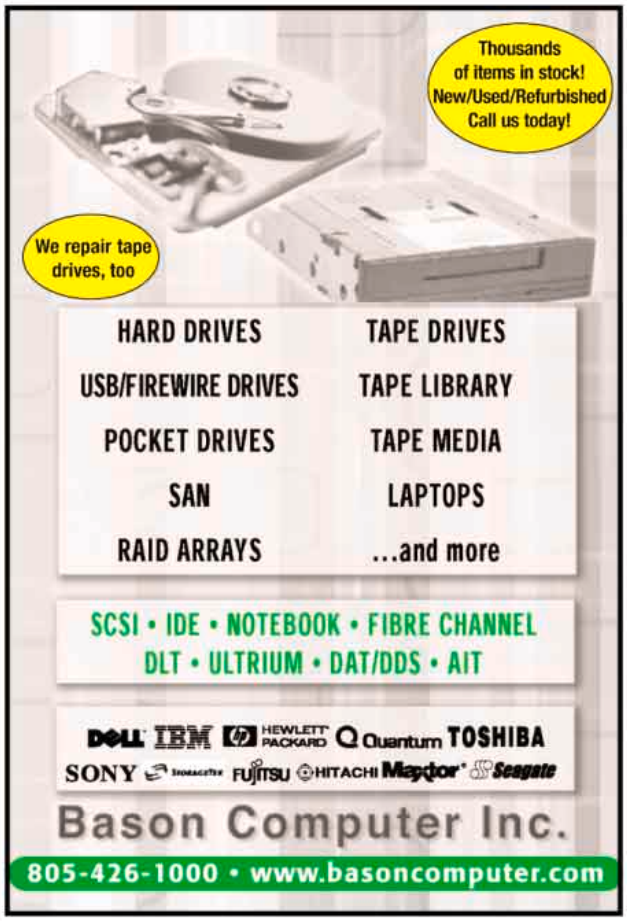

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A75 ... $194.99 A80 ... $229.99
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• 1xDig./1x Opt. Zoom
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Digital Rebel ... $629.99
G6 ... $549.99 S1-IS ... $304.99
EOS 1DS ... $5549.99 EOS 1D II $3799.99

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• 3x Optical Zoom
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S50 ... $229.99 43WR ... $274.99
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IST DS ... CALL MX ... $299.99

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X21 ... CALL X31 ... $164.99
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"I collect timepieces. When I received my Steinhausen, I knew from the look, feel, and quality of the watch that this would be one of my favorites. I have spent thousands of dollars for inferior watches. It will be my gift of choice this holiday season." Sol S., Mt. Vernon, NY

So rare that only a handful were made in 1923

In 1923, a Swiss watchmaker crafted the most advanced watch of its time. After 80 years, the Steinhausen watch has finally been "reborn," preserving its mastery of technology and classic design. Once only displayed in high priced collections, this rare timepiece from history can now be yours.

Step back in time to Steinhausen, Switzerland circa 1923. A master watchmaker works for months, trying to create the world's most perfect watch. Finally he succeeds—the first of its kind to display the date, day and month, and the only one to designate AM/PM.

Collectors Pay Thousands $$$$

He makes a limited number of these distinctive handmade timepieces, which eventually find their way onto the wrists of only the world's most distinguished gentry. Today, collectors are willing to pay thousands of dollars to add one of these original Steinhausen masterpieces to their own collection.

Reborn After 80 Years

Until now, that was the only way you could own a Steinhausen, still one of the world's rarest and most prized wristwatches. But for the first time in 80 years, the original Steinhausen masterpiece is now being painstakingly reproduced for modern day collectors. Still manufactured by hand, this 21st-century reproduction carries the same graceful styling and features as the original. The scratch-resistant crystal comfortably rests in a surgical grade stainless steel case and bezel, which provides the ultimate in precision and protection.

Powered by You

This handsome timepiece has been updated with a kinetic automatic movement that is powered by the motion of the wearer's arm, so the watch never needs winding or batteries.

Hand-crafted Elite Movement

The Steinhausen movement consists of 185 parts, that are assembled entirely by hand. To prevent wear on gears, fine watches use tiny gemstones to reduce friction. The Steinhausen features up to 35 jewels, 15 more than most of the worlds elite watches. The movement is then rigorously tested for flaws and accuracy. Only 6% of the movements made ever meet the stringent requirements to be placed in this noble timepiece, making the Steinhausen one of the most accurate in the world.

THE STEINHAUSEN REBORN

Old world craftsmanship & new world technology

- Transparent rear crystal displays movement.
- Kinetic movement – requires no battery or manual winding.

- 185 precision parts assembled by hand.
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Kinetic movement...never needs batteries... never needs winding!

Adapted from Swiss Technology

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1868 Steinhausen masterpiece is created | **1923** 1st Automatic movement in a wrist watch | **1953** Girard-Perregaux introduces the Swiss quartz watch | **2003**

Patek Philippe makes first wrist watch | Lips produced the first battery powered watch | **1966** Steinhausen masterpiece is reproduced for first time

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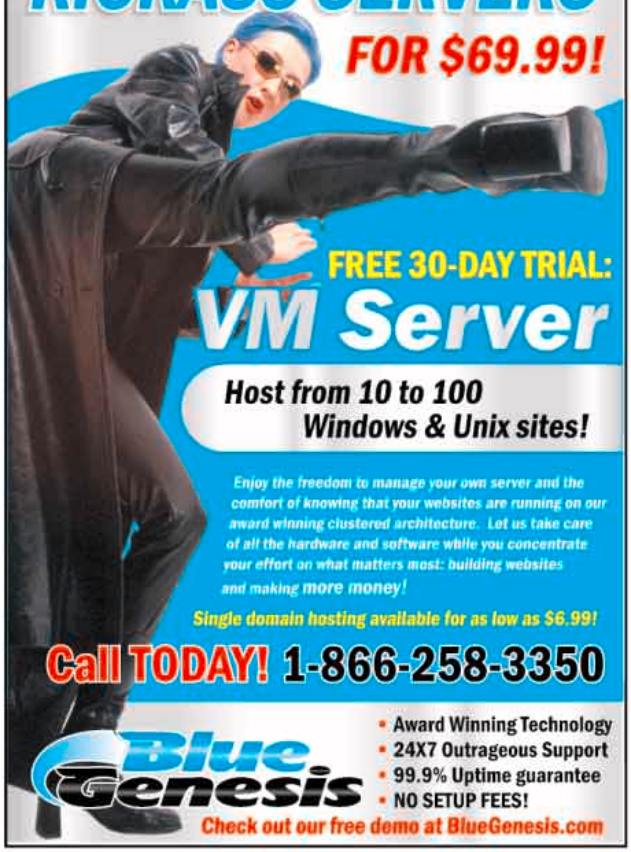

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Do-It-Yourself Home Security

BY TROY DREIER

It's the do-it-yourself approach to home security: Why pay a company when you can install cameras yourself? The ones reviewed here let you view your home while you're away, to check in and get a little peace of mind. • Networked home security cameras aren't new, but with more families running wireless networks, adding a camera or two has suddenly become easy enough for even nontechnical folks to handle. What was once a complex operation is now often as simple as plugging a camera into your wireless router. • While researching this story, we discovered that there's no widespread agreement on what a security camera should come with or even what it should do. For instance, Smarthome's starter kit offers home automation possibilities, and Motorola's system lets you add things like door and window sensors and temperature detectors. D-Link and Panasonic both deliver excellent cameras but stop short of creating full-scale home-monitoring packages. All but the Panasonic offering can be set to give you e-mail alerts when they detect motion.

Each of these security systems needs an always-on broadband connection for Web viewing. A good security system offers cameras that can be controlled via an online connection, has motion-sensitive recording software, and is expandable, letting you add more cameras or other types of monitoring modules.

WHAT THE RATINGS MEAN

- ●●●●● EXCELLENT
- ●●●●○ VERY GOOD
- ●●●○○ GOOD
- ●●○○○ FAIR
- ●○○○○ POOR

D-Link DCS-5300G Securicam Wireless Internet Security Camera

PC MAGAZINE EDITORS' CHOICE

This brand-new D-Link package is a standout. The camera has a high-quality image, smooth pan and tilt movements, and a speedy 802.11g connection for video streaming at up to 30 frames per second. Using the DCS-5300G with a wired connection to a router is simple (the camera has UPnP support, so you can easily mount it on your Windows ME or XP computer). Once it's connected, follow the instructions in the manual to set the camera for wireless use.

The package includes one camera, a mounting stand, an infrared remote, and the necessary software. There's also an AV cable, so that you can connect the camera to a TV and record to a VCR. The camera has an impressive range of motion, panning 270 degrees from side to side or 90 degrees up and down. It features a CCD sensor and a 4X digital zoom and can record audio as well as video.

Using a Web browser, you can quickly access the camera from inside or outside your home network. Most of the camera's controls are accessible online, which lets you aim the camera and zoom in on your subject remotely. You can set up motion-sensitive recording, e-mail alerts when the camera detects motion, and preset views that quickly focus on a specific area. There's no tool to help you get the camera working with an outside connection, though, so you'll need to open four ports in your router and change some settings in your firewall to get it to work.

The DCS-5300G comes with optional high-end software that lets you monitor 16 cameras at once; you'll feel like the commander of your own private surveillance company. All told, this package costs more than the others here, but if you want a well-built camera with a robust set of features, it's worth the price.

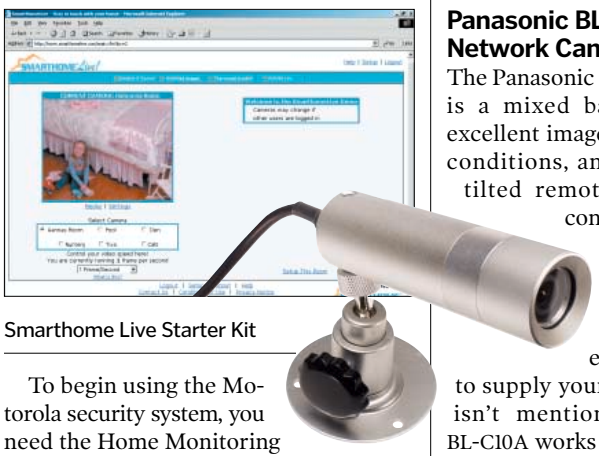
Requirements are a 1.76-GHz or better processor and 128MB of RAM. A 2.4-GHz processor, 512MB of RAM, and a 32MB video card are recommended for using IP Surveillance software with multiple cameras.

The D-Link DCS-5300G.

$549.99 list. D-Link Systems Inc., www.dlink.com.
●●●●○

Motorola Home Monitoring and Control

Motorola takes the prize for creating the easiest-to-use home security system: It's a snap to set up and can be expanded with several useful attachments. It's even affordable. But the camera's quality is comparable to that of an average webcam, and the package lacks some of the features of more advanced systems.



Smarthome Live Starter Kit

To begin using the Motorola security system, you need the Home Monitoring and Control PC Starter Kit, which comes with a wireless camera, a wireless base station, and software. You don't have to have a wireless network in place; simply connect the base station to one of your computer's USB ports and use the software's wizard to create a link to the camera.

The included camera records audio as well as video and can work outside and inside. But images are grainy and quite dim in low light. Also, you can't control the camera remotely through a Web browser, as you can with the D-Link and Panasonic cameras. You can set up e-mail alerts for motion detection, though.

Motorola has a clever line of products that work with this system. You can purchase wireless sensors for windows and doors, water, and temperature, as well as a power controller for turning lamps and appliances on and off. You can monitor all of this online, but that costs extra. The software directs you to create a $19.95-per-month Shell HomeGenie account to view your security system remotely.

Requirements are Windows 2000 or XP, an Intel Pentium II processor or better, 128MB of RAM, 45MB of storage for installation, and 500MB of storage for archives.

Kit, $299 list; extra camera, $119; home automation modules, $35 each. Motorola Inc., http://broadband.motorola.com. ●●●◐○

Motorola Home Monitoring

Panasonic BL-C10A Wired Network Camera

The Panasonic BL-C10A Network Camera is a mixed bag. The camera shows excellent images, especially in low-light conditions, and it can be panned and tilted remotely through a browser connection. But on the downside, the BL-C10A doesn't work wirelessly or record audio.

Installing the camera is easy, but you'll need to supply your own Cat-5 cable (which isn't mentioned on the box). The BL-C10A works only with a physical connection to your router, so you can either use it close to the router or buy a long, long cable.

This camera provides an even better picture than the D-Link's. But the image is all you get, since the camera can't record audio. This is the only camera in the roundup with a Privacy button that you can press when you don't want to be recorded. It's also the only one that doesn't offer e-mail alerts.

Panasonic BL-C10A

The BL-C10A has decent pan and tilt abilities (100 degrees side to side and 50 degrees up and down). You can control this via a browser, but the camera doesn't have the D-Link camera's range, nor can it zoom in.

The software includes a simple wizard that helps you set up a browser connection and register for a free account at *www.viewnetcam.com* (a site owned by Panasonic), so you can monitor your camera online. The wizard configures your router for you, which means there's no messing around with ports—a nice plus. Browser-based controls let you create eight preset views (so that you can see them with one touch) and monitor up to 16 cameras at once on the multiview page.

Requirements are Windows 98SE, ME, 2000, or XP, and Internet Explorer 6.0 or later; a 100-Kbps Internet connection or better is recommended.

$199 list. Matsushita Electric Corp. of America, www.panasonic.com. ●●●○○

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Smarthome Live Starter Kit

The Smarthome Live monitoring system is a holdover from a previous age of home security devices: Although it's a wonderfully expandable system, with controls to automate everything in your home, you have to work harder to get there than with other more up-to-date systems.

The first step in using Smarthome Live is signing up for an online account (which costs either $7.99 or $9.99 monthly), because the system won't work without a subscription, even for local video monitoring. Once you've installed the software, you connect a box, the Video Gateway, to a USB port and hook up your video cameras to that. Because the camera isn't wireless, you have to run the thick black wire all over your house.

The kit comes with a heavy silver camera that looks like the Apple iSight but weighs several times more. The camera needs to be mounted on a wall or ceiling (it isn't made just to sit on a shelf) and comes with a 100-foot video cable. Smarthome makes wireless cameras that work with this system too, but only a wired one is included in the Starter Kit. It doesn't pan, tilt, zoom, or record audio.

Once you're viewing your system online, you can add up to four hardwired cameras and three wireless ones to your account. The video quality is fair—not as strong as that of the D-Link or the Panasonic cameras. You can get e-mail alerts when the camera perceives motion.

The kit also comes with a PowerLinc AC unit—an X10 home automation controller—and a LampLinc module that works with it. Use it to turn a lamp on and off while you're away. Smarthome sells additional X10 units that let you automate other things in your home as well.

Requirements are a 433-MHz processor (though 700 MHz is recommended), 128MB of RAM, and an always-on Internet connection.

$383 list. Smarthome, www.smarthome.com. ●●◐○○

GEAR + GAMES

Triple-Threat Boom Box

The multitalented **Delphi CD Audio System** is an AM/FM radio, a 120-channel XM satellite radio, and an MP3 CD player. The design is showy: Push the top of the center section, and it rotates to reveal the CD player and AM/FM radio; pull, and it rotates back to satellite radio. A tube holding six D-cell batteries provides true portability (with 6 to 12 hours of playing time)—if you consider 12.3 pounds, including batteries and the AC transformer, portable. Sound quality is better than that of the initial Delphi SKYFi Audio System, which was satellite radio only.—*Bill Howard*

$200 street (requires $100 tuner module and monthly service, $9.99). Delphi Corp., www.delphi.com/products. ●●●○○

MP3 as Bling

With earbuds that moonlight as a necklace, the tiny 128MB **Virgin Pulse VP-1100** is intended to be worn like jewelry. Although the player is ultralightweight (an armband is also included), its lack of an LCD and its MP3-only format are drawbacks. But the attractive and handy player offers good sound quality and intuitive operation. If you're still jogging with a Sony Discman and can't shell out $330 for a latest-gen iPod and Apple armband, slap down just one Benjamin for the whole Virgin shebang.—*Jessica Levine*

$100 street. Virgin Electronics, www.virginelectronics.com. ●●●○○

One Tough Flash Drive

USB flash drives are so useful—until you crack the plastic case. The **SanDisk Cruzer Titanium** is coated with titanium, which gives this 512MB USB 2.0 flash drive a solid feel. As with other Cruzer models, the USB connector slides back into the housing when not in use. The Cruzer Titanium ships with CruzerSync, which does a good job of synchronizing your Outlook files. Also included are CruzerLock, which lets you encrypt files, and Cruzer PocketCache, a 90-day evaluation program ($20 to license) that facilitates backing up files and directories.—*Craig Ellison*

$199.99 list. SanDisk Corp., www.sandisk.com. ●●●●○

Waterproof Sound

The **dreamGEAR Boom Boom Multi-Box** is irresistible: a fun product at a bargain price. You can use it with any portable audio player—from a simple CD player to an Apple iPod—to share your sounds. Just plug the player into the Boom Boom Multi-Box's audio cable and secure it with the elastic strap so it won't jiggle around inside the case. The speakers are surprisingly good, but here's the best part: The Boom Boom Multi-Box is water resistant and even comes with a shower hook. Take it to the beach or the tub without worrying. It comes in six colors and runs on four double-A batteries.—*Troy Dreier*

$19.99 list. dreamGEAR LLC, www.boomboombox.com. ●●●●◐

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Alternative Dating

BY WILLIAM VAN WINKLE

Match.com, eHarmony, and other mainstream dating sites have helped hook up lots of couples. But despite profile questionnaires and other filtering and matching mechanisms, many people still shake their heads and wonder, "Why on earth did I get paired with this freak?" Perhaps you need a specialty dating site that goes with the way you define yourself. The five sites we found serve a wide spectrum of groups.

GAY.COM

Gay.com

Gay.com has over 4 million member profiles and, unlike nearly all dating sites, it caters more to men than women (although both genders are well represented). We appreciate the site's professional demeanor and that adult content is reserved for premium members ($9.95 per week, up to $79.95 per year). The AutoSearch function runs periodic queries for new hits in your area, then e-mails you the results. Also handy is the virtual Black Book, with which you can bookmark or block profiles, and the chat tools are excellent.

PlanetOut Inc., www.gay.com. ●●●●◐

HurryDate

HurryDate is a pioneer in "speed dating," wherein a group of ladies and gents gather, mingle, and rotate through an average of 25 mini-dates (4 to 7 minutes each) over the course of an hour and a half. To take a budding romance further, you move to e-communication through Hurry Date.com. It's a conventional dating site you can use independently of the party meetings, which occur in some 70 cities in the U.S., the U.K., and Canada. Posting a profile and replying to messages are free, but initiating a message costs. Membership runs $15, $35, and $55 for one, three, and six months, respectively. Parties cost $30 to $35 each, and members receive a 25 percent discount.

Hurry Brands LLC, www.hurrydate.com. ●●●●○

Meetup

If online date-hunting intimidates you, a better approach might be to seek people with whom you share an interest. In a group, you can focus on making friends who someday might turn romantic.

Meetup spans almost 5,000 interest topics. Sign up for one, arrive at the local Meetup venue for drinks and discussion, and see what happens. Meetup's services are completely free, although by the time you read this, a premium M+ service ($3 a month) will deliver enhanced e-mail and photo-hosting tools to members.

Meetup Inc., www.meetup.com. ●●●●○

SeniorsCircle.com

This site is a great social resource for those in the 50-plus crowd—and even those in their 70s and 80s. Free registration lets you create a profile and send messages ("winks") to other members, but replying requires membership: one month for $20, one year for $95. The automated match finder, CyberCupid, is a useful perk, and free multilingual translation services should be coming soon.

SocialPlus.com Inc., www.seniorscircle.com. ●●●○○

VEGGIEDATE.COM

VeggieDate.com

VeggieDate.com is a rare haven for those whose diet precludes meat. Members come from all over the globe, and VeggieDate excels at sorting by religious belief, including atheist, Buddhist, and Unitarian. The search engine can also sort by profile keywords.

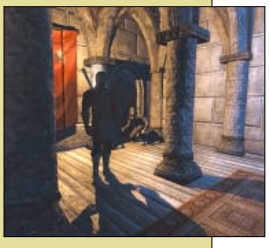
Unlike many sites, VeggieDate lets you post as well as view complete profiles for free. You pay only when you want to send someone a message, and the service is a steal at $10 for three months or $20 for a year. The catch is that most of the U.S. members live in California, so pickings could be slim in your area.

GreenPeople, www.veggiedate.com. ●●●◐○

QUICK CLIPS

Thief: Deadly Shadows

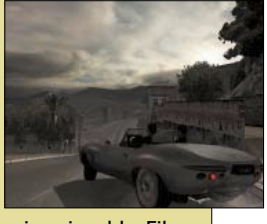
In this game, players assume the role of Garrett, the best thief in town. During what seems like a standard robbery, Garrett reluctantly gets mixed up in a larger conspiracy. Players are encouraged not to kill—the guards put up a good fight, and the ruckus might attract unwanted attention. Graphically, Thief is pleasing: The game world—gothic meets early industrial age—is highly detailed. The sounds are realistic, and the guards spew funny comments. For PC.—*John Blazevic*



$39.99 list. Eidos Inc., www.thief3.com/main.html. ●●●●○

DRIV3R

A driving game at heart, this third edition combines realistic driving physics, violent gunplay, and exhilarating car chases, all against a backdrop of gorgeous cityscapes. Toggling between first and third person is a great feature, especially during frenetic gun fights. The attention to detail—reflections in sunglasses, shadows cast by the setting sun—is enjoyable. Film Director makes replays infinitely tweakable; you'll love watching spectacular crashes repeatedly. For PS2 and Xbox (tested).—*Matthew D. Sarrel*



$50 street. Atari Inc., www.atari.com. ●●●●◐

Full Spectrum Warrior

Are you ready to lead two squads of men into urban antiterrorist combat? Though not for everyone, this ultrarealistic implementation of U.S. Army training principles is a must for the military minded. Precision controls are complex but intuitive. Neutralize the enemy in a variety of conditions and look sharp—you'll need to pay attention to every detail to keep your men alive. This is the best squad-based tactical action game we've played. For PC and Xbox (tested).—*MDS*

$50 street. THQ Inc., www.thq.com. ●●●●●

BACKSPACE

GENTLE REMINDERS OF THE UNIVERSE'S IMPERFECTION

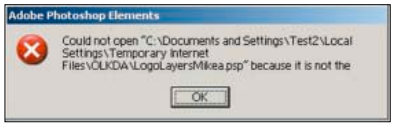
Edited by Don Willmott

My Life was released today; We thought you'd be interested because you bought Massage for Beginners.

Amazon.com: An exhaustive, soul-searching memoir, Bill Clinton's My Life is a refreshingly candid look at the former president as a son, brother, teacher, father, husband, and public figure. Clinton painstakingly outlines the history behind his greatest successes and failures, including his dedication to educational and economic reform, his war against a "vast right-wing operation" determined to destroy him, and

Smirk. (Amazon.com)

Because it is not the what??? The what???!!! (Adobe Photoshop Elements)



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What about mother-in-law control? (home.respond.com)

Programmers are always looking for an easy scapegoat. (Microsoft.com help)

Backspace on the Road: Belize

Seeing double! This Chelsea Clintonesque young woman shows up online shilling for both Gateway (above) and Dell (right).

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Ziff Davis Media Inc. shall own all property rights in the entries.
Winners this issue: Mari Eustace, James Holman, Carey Holzman, Mike Klassen, Jamie Macsisak, Darren Schreiber, and Lorenzo Tulipano.

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