

### Corporate Desktops

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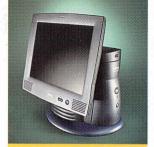
Real-Time Web Presentation Services That Can Change the Way You Work

# AMD/Intel Head to Head

Athlon/750 and Pentium III/733 Compete for the Fastest PC Title

# Internet Solutions

Making Sense of And Using the Channels in Internet Explorer



### FIRST LOOKS

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- System Recovery Utilities
- GoldMine 5.0
- HomeSite 4.5
- Netpliance i-opener
- WebLink e-Pager

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THE INDEPENDENT GUIDE TO PERSONAL COMPUTING AND THE INTERNET

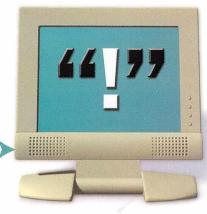
OL.19 NO.2 JANUARY 18.2000

# INSTANT MESSAGING



# THE NEW WAY TO TALK

**BUSINESS** 



# PC Labs Tests the Best Ways to

- Improve Communications
- Build Better Communities
- Meet New Customers



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### PRESARIO 5700T-700 INTERNET PC

Intel® Pentium® III Processor, 700 MHz

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20.0 GB (7200 rpm) UltraDMA Hard Drive®

10X DVD-ROM Drive®

3Dfx Voodoo 3 3500 Graphics Card with 16 MB

Sound Blaster™ Live! Value PCI Audio

6.0Mb Max Digital Modem®

JBL Pro Amplified Speakers

Digital Creativity Imaging Center®

Microsoft® Featured Home Collection

Microsoft Word

Microsoft Windows®98

Compaq CV915 19" Monitor (18.0" VIA)

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250 MB lomega Zip Built-In™ Drive + 1 Disk: Add \$149

Agfa Snap Scan USB Scanner: Add \$129

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PRESARIO 1900T
A Thin and Light Next-Generation
Mobile Internet PC



PRESARIO 1800T
Powerful Desktop Performance
in a Mobile Internet PC

### PRESARIO 1800T-500 INTERNET NOTEBOOK PC

15.0" TFT Active Matrix Display

96 MB SyncDRAM expandable to 192 MB

6.0 GB UltraDMA Hard Drive¹

CD-RW Drive¹

ATI Rage LT Pro Hardware Accelerated 3D Graphics

Intel Mobile Pentium III Processor, 500 MHz

with 8 MB Video Memory

56K ITU V.90 Modem (PCI)<sup>3</sup>

Ultra Hi-Capacity Lilon Battery
256 KB Integrated "On-chip" cache

10/100 Base T Ethernet Network Card

Microsoft Featured Home Collection

Microsoft Windows98

\$2999<sup>‡</sup> | As low as \$84 per month

10.0 GB UltraDMA Hard Drive1: Add \$150 128 MB SyncDRAM: Add \$100

Mobility Auto Adapter: Add \$99

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	PRESARIO 5700T-650 INTERNET PC	INTERNET PC	INTERNET PC	INTERNET PC
	Intel Pentium III Processor, 650 MHz	Intel Pentium III Processor, 600E MHz	Intel Pentium III Processor, 500 MHz	Intel Pentium III Processor, 500 MHz
3	128 MB 100 MHz SyncDRAM expandable to 384 MB	128 MB 100 MHz SyncDRAM expandable to 384 MB	64 MB SyncDRAM expandable to 384 MB	128 MB SyncDRAM expandable to 384 MB
	20.0 GB (7200 rpm) UltraDMA Hard Drive <sup>1</sup>	13.4 GB (7200 rpm) UltraDMA Hard Drive <sup>1</sup>	13.0 GB UltraDMA Hard Drive <sup>1</sup>	13.0 GB UltraDMA Hard Drive <sup>1</sup>
	10X DVD-ROM Drive <sup>7</sup>	10X DVD-ROM Drive <sup>7</sup>	32X Max CD-ROM Drive <sup>2</sup>	32X Max CD-ROM Drive <sup>2</sup>
	3Dfx Voodoo 3 3500 Graphics Card with 16 MB	Voodoo 3 1000 2X AGP Graphics Card with 16 MB	Voodoo 3 1000 2X AGP Graphics Card with 16 MB	Voodoo 3 1000 2X AGP Graphics Card with 16 MB
	Sound Blaster Live! Value PCI Audio	Sound Blaster Live! Value PCI Audio	Sound Blaster Live! Value PCI Audio	ESS Solo PCI Audio
	6.0Mb Max Digital Modem⁵	56K ITU V.90 Modem <sup>3</sup>	56K ITU V.90 Modem³	56K ITU V.90 Modem <sup>3</sup>
	JBL Pro Premium Speakers w/Subwoofer	Klipsch v.2-400 Watt Speaker System	Klipsch v.2-400 Watt Speaker System	JBL Pro Amplified Speakers
	Digital Creativity Imaging Center®	Digital Creativity Imaging Center <sup>s</sup>	Digital Creativity Imaging Center <sup>s</sup>	Digital Creativity Imaging Center®
	6.0 Mbps Home Phoneline Networking Card <sup>11</sup>	Microsoft Featured Home Collection	Microsoft Featured Home Collection	Microsoft Featured Home Collection
	Microsoft Featured Home Collection + MS® Word	Microsoft Word	Microsoft Word	Microsoft Word
	Microsoft Windows98	Microsoft Windows98	Microsoft Windows98	Microsoft Windows98
	Compaq CV715 17" Monitor (16.0" VIA)	Compaq CV715 17" Monitor (16.0" VIA)	Compaq CV515 15" Monitor (13.8" VIA)	Compaq CV515 15" Monitor (13.8" VIA)
	\$2299 <sup>‡</sup>   As low as \$64 per month <sup>†</sup>	\$1999 <sup>±</sup>   As low as \$56 per month <sup>†</sup>	\$1499 <sup>±</sup>   As low as \$42 per month <sup>†</sup>	\$1299 <sup>‡</sup>   As low as \$37 per month <sup>†</sup>
	4X CD-RW <sup>10</sup> and Klipsch 400 Watt Speakers: Add \$175	20.0 GB (7200 rpm) UltraDMA Hard Drive': Add \$108	Intel PC Camera Pack USB: Add \$79	IJ750 Color Inkjet Printer: Add \$149
	Compaq CV915 19" Monitor (18.0" VIA): Add \$200	Compaq CV915 19" Monitor (18.0" VIA): Add \$200	Compaq CV715 17" Monitor (16.0" VIA): Add \$70	Compaq CV715 17" Monitor (16.0" VIA): Add \$70
	Agfa Snap Scan USB Scanner: Add \$129	HOLIDAY PROMOTION: 4X CD-RW Drive $^{10}$ : Add \$1 $^6$	HOLIDAY PROMOTION: 4X CD-RW Drive10: Add \$16	Intel PC Camera Pack USB: Add \$79

ΛB

PRESARIO 1800T-500 INTERNET NOTEBOOK PC	PRESARIO 1900T-400 Internet notebook PC	PRESARIO 1800T-450 INTERNET NOTEBOOK PC	PRESARIO 1800T-433 Internet notebook PC
Intel Mobile Pentium III Processor, 500 MHz	Intel Mobile Pentium II Processor, 400 MHz	Intel Mobile Pentium III Processor, 450 MHz	Mobile Intel Celeron™ Processor, 433 MHz
14.1" TFT Active Matrix Display	13.3" TFT Active Matrix Display	14.1" TFT Active Matrix Display	15.0" TFT Active Matrix Display
64 MB SyncDRAM expandable to 192 MB	64 MB SyncDRAM	64 MB SyncDRAM expandable to 192 MB	64 MB SyncDRAM expandable to 192 MB
10.0 GB UltraDMA Hard Drive <sup>1</sup>	6.0 GB UltraDMA Hard Drive <sup>1</sup>	6.0 GB UltraDMA Hard Drive <sup>1</sup>	4.8 GB UltraDMA Hard Drive <sup>1</sup>
6X DVD-ROM Drive⁴	6X DVD-ROM Drive⁴	24X Max CD-ROM Drive®	24X Max CD-ROM Drive <sup>a</sup>
ATI Rage LT Pro Hardware Accelerated 3D Graphics with 8 MB Video Memory	ATI Mobility Hardware Accelerated 3D Graphics with 8 MB Video Memory	ATI Rage LT Pro Hardware Accelerated 3D Graphics with 8 MB Video Memory	ATI Rage LT Pro Hardware Accelerated 3D Graphics with 8 MB Video Memory
56K ITU V.90 Modem (PCI) <sup>3</sup>	56K ITU V.90 Modem (PCI) <sup>3</sup>	56K ITU V.90 Modem (PCI) <sup>3</sup>	56K ITU V.90 Modem (PCI) <sup>3</sup>
Ultra Hi-Capacity Lilon Battery	Ultra Hi-Capacity Lilon Battery	Ultra Hi-Capacity Lilon Battery	Ultra Hi-Capacity Lilon Battery
256 KB Integrated "On-chip" cache	256 KB Integrated "On-chip" cache	256 KB Integrated "On-chip" cache	128 KB Integrated "On-chip" cache
10/100 Base T Ethernet Network Card	Microsoft Featured Home Collection	10/100 Base T Ethernet Network Card	10/100 Base T Ethernet Network Card
Microsoft Featured Home Collection	Microsoft Windows98	Microsoft Featured Home Collection	Microsoft Featured Home Collection
Microsoft Windows98		Microsoft Windows98	Microsoft Windows98
\$2799 <sup>‡</sup>   As low as \$78 per month <sup>†</sup>	\$2399 <sup>‡</sup>   As low as \$67 per month <sup>†</sup>	\$2199 <sup>t</sup>   As low as \$62 per month <sup>†</sup>	\$1999 <sup>‡</sup>   As low as \$56 per month <sup>†</sup>
128 MB SyncDRAM: Add \$200	Extra A/C Adapter: Add \$49	6X DVD-ROM Drive4: Add \$150	128 MB SyncDRAM: Add \$200
18.0 GB UltraDMA Hard Drive1: Add \$300	QuikDock with Integrated Ethernet: Add \$129	96 MB SyncDRAM: Add \$100	6.0 GB UltraDMA Hard Drive1: Add \$100
<b>HOLIDAY PROMOTION:</b> Monsoon Speakers with Subwoofer only \$1 with Purchase of a DVD Notebook <sup>12</sup>	<b>HOLIDAY PROMOTION:</b> Monsoon Speakers with Subwoofer only \$1 with Purchase of a DVD Notebook'2	Extra A/C Adapter: Add \$49	6X DVD-ROM Drive <sup>4</sup> : Add \$150

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### PRESARIO 5700N-500 INTERNET PC

Intel® Celeron™ Processor, 500 MHz

64 MB 100 MHz SyncDRAM, 4 MB Shared for Video

6.0 GB UltraDMA Hard Drive<sup>1</sup>

32X Max CD-ROM Drive<sup>2</sup>

2X AGP with 64-bit Hardware Accelerated 3D Graphics

ESS Solo PCI Audio

56K ITU V.90 Modem<sup>3</sup>

JBL Pro Amplified Speakers

Creativity Action Center

Microsoft® Featured Home Collection

Microsoft Word

Microsoft Windows®98

Compaq CV515 15" Monitor (13.8" VIA)

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Mobile Intel Celeron Processor, 400 MHz

12.1" TFT Active Matrix Display

64 MB SyncDRAM

4.8 GB UltraDMA Hard Drive<sup>1</sup>

24X Max CD-ROM Drive9

ATI Mobility Hardware Accelerated 3D Graphics with 8 MB Video Memory

56K ITU V.90 Modem (PCI)3

Ultra Hi-Capacity Lilon Battery

128 KB Integrated "On-chip" cache

Microsoft Featured Home Collection

Microsoft Windows98

\$1799<sup>†</sup>

As low as \$51 per month<sup>†</sup>

QuikDock with Integrated Ethernet: Add \$129

Extra A/C Adapter: Add \$49

Mobile Intel Celeron Processor, 433 MHz & 6X DVD-ROM Drive<sup>4</sup>: Add \$200



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# Michael J. Miller

# Being There (Sort Of)

"It's the next-best thing to being there." That's what you hear people say about long-distance telephone calls, about travel shows on TV, about Epcot; some people even say that about cheesy Las Vegas theme hotels that attempt to replicate Paris, Venice, New York City, or the wonders of ancient Egypt.

We're moving

away from store-

and-forward

communication

into an era

of real-time

communication.

So when is it really "the next-best thing to being there"? When you use your computer and the Internet to communicate with your colleagues, business partners, friends, and families in better ways. Alexander Graham Bell had the right idea; now we're taking it to the next level.

With its e-mail and newsgroups, the Internet has long been a good way for people to communicate over long distances. In the past few years, though, focus has shifted to Web sites and shopping, and many people haven't paid enough attention to the Internet as a communications medium. Fortunately, those who have paid attention have come up with a huge variety of ways to keep in touch.

We seem to be moving away from an era of store-and-forward communication (like e-mail or newsgroups) and into an era of real-time communication, where you carry on a conversation almost as if you were in the same room with your friend or colleague. Instant messaging is an obvious example. Three years ago, no one had ever heard of it, but then programs like AOL Instant Messenger and ICQ started to take off, and once teenagers got ahold of it, it was on a roll. Now it's become a

business tool as well; people can stay in constant contact wherever they are.

Some companies are even using instant messaging on their Web sites, letting users talk to real people for support and help. (Try it the next time you buy a sweater at landsend.com.) Others are adding more traditional voice communications; but however it's implemented, talking to others in real time has obvious benefits.

I'm also starting to see more Web-based presentations, where you can fire off questions in real time as the PowerPoint slides glide by and you listen to audio narration (and sometimes even watch video). Check out solutions from Intervu and WorldStream.

And how about videoconferencing? With Web-

cams getting really inexpensive, and with apps like Microsoft NetMeeting becoming more prevalent, there's no reason anyone shouldn't be able to see anyone else over the Web. It won't be anything close to TV-quality, but seeing the person you're talking to can add something to a discussion, even if it's only in an intangible way. Note that unlike traditional, complicated videoconferencing systems, Web-based videoconferencing is dirt-cheap.

All these technologies are changing the way people communicate. It's now much easier to get people together to make decisions, share information, and exchange ideas than ever before. Working with eight others becomes as easy as working with

one or two others.

Is this a truly compelling change for business? The widely scattered contributors who worked on this issue certainly think so. They enjoy the sense of community these technologies can build among a team that might otherwise not gel. The editors who work in our New York headquarters value them, too, for the convenience of getting instant answers without e-mail delays or time-wasting small talk. I think both issues-com-

munity and convenience—are crucial. However you slice it, these technologies are changing the way people work for the better.

Real-time communication software won't replace other methods of communication, of course. E-mail continues to be great for longer discussions and for carrying out conversations over time. It lets people work together even when their schedules don't match. Phones, both wired and wireless, continue to be a great way of getting things done. But for real communication, nothing beats a face-to-face meeting (which is why we all still travel so much). Verbal communication isn't necessarily any more effective, but the experience of being in the same room builds bonds far more effectively than technology ever will.



More on the Web: Editor-in-chief Michael J. Miller answers your computing questions every Tuesday, exclusively at PC Magazine Online.

www.pcmag.com/miller

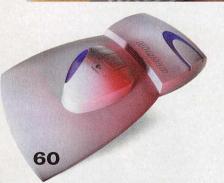




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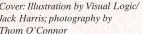


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and CD drives.
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### **IM Client Downloads**

Whenever you need to download software—like the instant-messaging clients evaluated in this issue's cover storycheck with us first. Our Software Library is bursting with tools and utilities, and most of them are free.

### **PC Price Check**

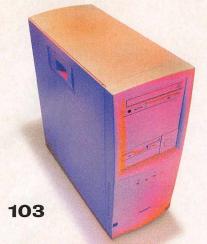
Want up-to-the-minute prices on the corporate managed PCs tested in this issue? Our shopping links will give you the latest quotes.

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# 82 Chat Goes to Work

Instant messaging isn't just for consumers anymore. Businesses are realizing that IM can help bring people together and speed up communications. We test five public services plus three private IM servers and show you which ones are office-friendly. By Frank J. Derfler, Jr.

### INTERNET

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Now you can deliver your PowerPoint presentations and work with anyone anywhere on the Internet from the comfort of your desk chair. We compare five services that make delivering your pitch electronically almost like being there. By Luisa Simone

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# 103 Corporate Managed PCs

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# **Wrist-Top Computing**

Voice recognition software typically requires many megabytes of storage space, but Conversa has developed a version of its software that fits into small devices. The initial version of the phone won't access the Web or send e-mail, but those functions are part of the big

currently selling a watchphone in Korea and plans to start selling one in the U.S. late this year.

picture. Samsung is

Meanwhile, Hewlett-Packard and Swatch are collaborating on a Web-surfing watch that will "simply plug into a rich array of Internet-based information and services," according to HP. "The watch is an ideal way to stay connected to the Net, because everyone has one and wears it willingly," says Mark Smith, head of the project at HP Laboratories. Swatch has already demonstrated Swatch Talk, a prototype watch with an integrated phone.

IBM is also exploring wristtop computing. IBM researchers have come up with a concept dubbed Watch Pad. The entire face of the watch is a touchsensitive display with access to a calendar, phone list, and of course, the time.

ow appropriate it is for a wristwatch phone to debut at the start of a new millennium. And a wristwatch computer may not be far behind.

Hold it. Back up a sec. How will you make a phone call, compose an e-mail message, or surf the Web without a keypad? Simple: You'll just talk to your wrist. A new watch-phone from Samsung (above), to be based on a 30-MHz ARM7 processor, will have built-in voice recognition and text-to-speech supportboth developed by Conversa so you'll be able to program frequently used phone numbers, place calls, and pick up Call Waiting by voice. It will also read you your e-mail messages aloud.

# Desktops Hit 750 MHz

dvanced Micro Devices and Intel have been playing a game of microprocessor leapfrog for months, and AMD has taken the lead with the announcement of its new 750-MHz Athlon processor. In early October, AMD's 700-MHz Athlon was the fastest desktop CPU around, but Intel quickly countered with the announcement of new 0.18-micron 733-MHz Coppermine processors for both desktops and servers.

AMD's new 750-MHz Athlon chip is also based on a 0.18-micron manufacturing process—a first for AMD. The process not only shrinks the processor but also reduces its power consumption. Compaq (in its Presario line), IBM (in its Aptiva line), and several other PC manufacturers plan to deliver systems based on the new Athlon chip soon.

And as for Intel, the company plans to boost the clock speeds of its high-end Coppermine Pentium III processors early this year.

# Music on a Stick-or a Clip

he company that launched the portable music revolution 20 years ago isn't about to miss out on the Web music phenomenon. Sony recently introduced its Memory Stick Walkman Personal Stereo (\$399 list), which stores up to 2 hours of music on a removable 64MB

Memory Stick. About the size of a big pack of gum and weighing less than 3 ounces, the new Walkman connects to a PC via USB.

Sony also recently began shipping its Music Clip Personal Network Player (\$299 list), which stores up to 2 hours of music on built-in flash memory, instead of a Memory Stick. You can attach the Music Clip to your clothing or use the included cord and wear it around your neck.

Both players are compliant with the Secure Digital Music Initiative (SDMI) format, which lets record companies such as Sony Music sell their music securely online. According to Sony, it won't be long before you'll be able to connect to the Web wirelessly from a portable player and buy music as you're bopping down the street.



MEMORY STICK WALK-MAN: Download music onto removable media.

# Online Gender Gap? Yep

I hen it comes to the Web, men and women go their separate ways. From shopping to checking stock quotes, new survey data from PC Data Online suggests that gender difference creates very different Web-surfing dynamics.

As far as checking e-mail is concerned, women are more conscientious than men are, with 81 percent of women regularly checking their e-mail boxes compared with 70 percent of men. Women are also more likely to gather information about topics that interest them. Fifty-two percent of women do this regularly, as opposed to 44 percent of men. Men are three times as likely to get sports information online than women, and men also check their stock quotes online more often than women do.

When it comes to online shopping, both men and women rank software, hardware, books, and music among their top preferences. The exceptions: Pornographic material is the third most popular item for men, and greeting cards are the second most popular item for women.

### Top Five Online Purchases

### FOR MEN

- 1. Computer software
- 2. Computer hardware
- 3. Pornographic material
- 4. Books
- 5. Music

### FOR WOMEN

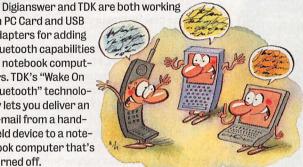
- 1. Computer software
- 2. Greeting cards
- 3. Music
- 4. Books
- 5. Computer hardware

# Coming Soon: Bluetooth

fter years of promises, the 2.4-GHz radio communications technology dubbed Bluetooth looks like it's coming to fruition. Several Bluetooth-enabled designs-ranging from PC Cards to USB adapters and more—were shown at the recent Comdex trade show in Las Vegas.

Bluetooth is a radio-based specification for wireless communications among various types of devices, such as between handheld and notebook computers, or between a cell phone in your pocket and a speaker/microphone in your ear. The specification was initially developed by Ericsson, IBM, Intel, Nokia, and Toshiba.

on PC Card and USB adapters for adding Bluetooth capabilities to notebook computers. TDK's "Wake On Bluetooth" technology lets you deliver an e-mail from a handheld device to a notebook computer that's turned off.



Motorola also has ambitious plans. The company is pushing personal area networks, or PANs, based on Bluetooth radio technology. The company recently demonstrated notebook computers and hand-held computers communicating wirelessly with cell phones. It also showcased automobile-based docking stations for Bluetooth devices.

**Communicating Without** Keyboards

s computing gadgets get smaller and smaller, so do their so-called keyboards. Typing an e-mail message on a pager or cell phone can be frustrating, to say the least. InMotion, based in Haifa, Israel, has devised an alternative: pen input technology that lets you write on plain paper.

Pen input usually requires a digitizing surface, but as you write with InMotion's "e-pen," the device transmits radio frequency signals to



receivers built into whatever computing device you're using—a phone, a hand-held organizer, or a notebook. The data is used to determine the pen's movements based on its x,y coordinates and up/down position and capture your handwriting as "ink." (The technology also works with handwriting recognition software.) InMotion is working with manufacturers to build the technology into all sorts of devices.

THIS ISSUE'S CONTRIBUTORS: Carol Levin, Sharon Nash, and Sebastian Rupley.



# Bar-Coded **Bargains**

ver wander into a store sale and wonder whether the prices are really rock bottom? Now, a quick search on the Web can help you make sure you're getting a real bargain. In the latest twist in online comparative-shopping tools, BarPoint.com has developed a free Web app called BarPoint Shopper (www.barpoint.com). This lets you input 12-digit bar codes, known as universal product codes (UPC), into your Palm VII and scour the Web for price comparisons and product information while you're standing right in the store.

You can key the UPC into your Palm VII manually, or you can scan the bar code with a Palm-based Symbol scanner. Support for other hand-held devices, cell phones, and pagers is under development.

Initially, BarPoint is offering UPC searches for books, audio books, DVDs, videos, music, computer hardware, and software. The company plans to add other items, such as groceries and health and beauty products, early this year.

### Top Retail Games

MP Roller Coaster Tycoon Hasbro Interactive

Microsoft Age of Empires II: Age of Kings Microsoft

Deer Hunter III GT Interactive

Delta Force 2 Nova Logic

Cabela's Big Game Hunter Activision

Sim Theme Park Electronic Arts

Pokemon Studio Blue Mattel Interactive

Pokemon Studio Red Mattel Interactive

Starcraft Hayas Interactive

Tonka Construction 2 Hasbro Interactive Source: PC Data, week of Nov. 7-14, 1999.

### **Critical Mass**

he Internet has been careening toward a record of 1 billion hits per day for a couple of years, and it finally crossed that mark in October of 1999, according to Media Metrix. Researchers there recorded 32.2 billion page views in October, up 49 percent from October of 1998.

What's not growing as fast, however, is the number of people visiting the Internet. Media Metrix recorded 63.9 million unique visitors for October 1999, up 12.5 percent from October of 1998. In sum, Internet access is growing steadily, and those already online are visiting far more pages than they were a year ago.

### What Drives E-Loyalty? Offering the lowest prices may not be the quickest way to online customers' hearts. The most important driver for repeat online sales is the

quality of customer service, followed closely by on-time delivery, according to performance ratings from BizRate.com. Product price is the least likely factor in retaining customers



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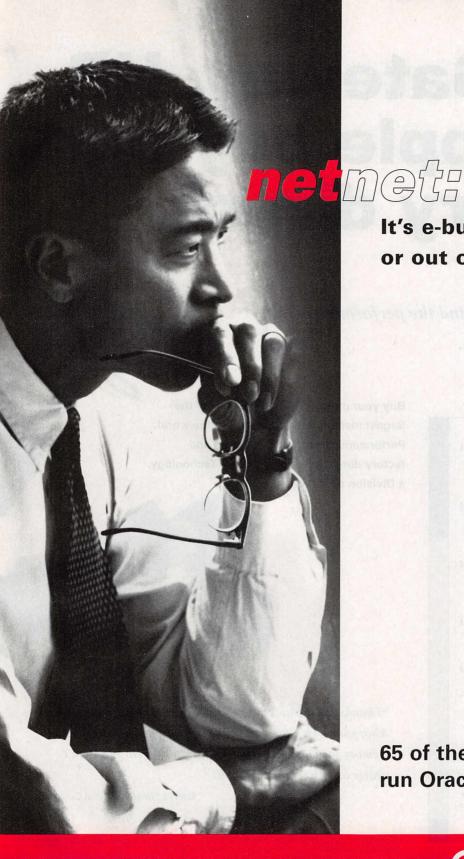


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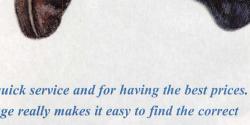
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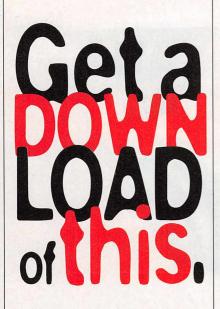
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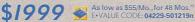
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\$2249 As low as \$61/Mo., for 48 Mos. \*\*

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Dell Recommended Upgrade:

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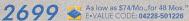
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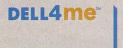


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- 48X Max<sup>a</sup> Variable CD-ROM Drive
- NEWSB Live! Value Digital with MusicMatch\* Jukebox Enhanced Version®
- NEW Harman Kardon HK-595 Surround Sound Speakers with Subwoofer
- NEW Conexant™ V.90 56K Capable¹¹ Telephony Modem for Windows
- 1-Year DelInet<sup>sM</sup> Internet Access\* with 20MB of Online Backup\*





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- 48X Max® Variable CD-ROM Drive
- Turtle Beach Montego II A3D™ 320V Sound Card with MusicMatch® Jukebox Standard Version38
- NEW Harman Kardon HK-595 Surround Sound Speakers with Subwoofer
- 1-Year DelInet<sup>SM</sup> Internet Access<sup>14</sup> with 20MB of Online Backup<sup>16</sup>
- NEW Conexant<sup>™</sup> V.90 56K Capable<sup>™</sup> Telephony Modem for Windows

\$1999 S As low as \$55/Mo., for 48 Mos.<sup>33</sup> E-VALUE CODE: 04228-501219

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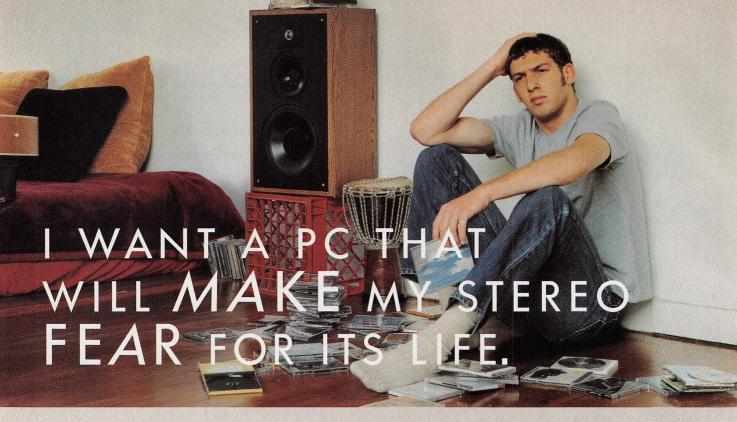
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- RI0 500 Portable Digital Audio Player, add \$269

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# **LETTERS**

### SPEED MACHINES

In your December 1 "Fast PCs" cover story, you applaud the TigerDirect K Series Extreme 600 systems as being "one of the fastest" with "Web-based support." All this may be true, but you are omitting some important factors. This company has a reputation for having the worst support. In addition, it shipped me a PC with a motherboard inferior to the one illustrated in the catalog and did nothing to correct the problems this created.

ED CARNEY via the Internet

TigerDirect is a relatively small company and was mentioned in fewer than fifty responses to our latest Service and Reliability Survey (July 1999). We cannot judge the company's service and reliability without sufficient statistical data.—Ed.

Some things in your evaluations seem a little inconsistent. In the fold-out table in your "Fast PCs" story, you rate the Quantex SM600 SE as Poor for setup and getting started, for connecting to the Internet, for general use, and for service, support, and upgrading. Your review of the system refers to the lack of documentation for startup and Web access, but I'm curious about the reasons behind the ratings for general use and service, support, and upgrading.

You compliment the machine's hardware capabilities, describing it as "loaded with goodies" and "well outfitted." The fact that you can't even rate its general use capabilities as Fair seems to suggest some rather significant deficiency. Yet there is nothing in the review to explain this.

I'm even more perplexed over your Poor rating for service, support, and upgrading. Quantex got the highest rating possible on your Service and Reliability Survey in July. You even list the results of this survey next to the scorecard in the fold-out, and in your review, you describe the machine as "well supported."

MARK THOMSON via the Internet

### How to Contact Us



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article or column prompted your response.

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### CLOSING YOUR E-WALLET

I enjoyed Jim Seymour's December 1 column ("Opening Your E-Wallet") about one-click purchasing. Reading his views was interesting. I think of myself as an insider on e-wallets, although the ones I worked on at CyberCash didn't garner even a mention in Mr. Seymour's column. I was part of the team that created what CyberCash called InstaBuy.

One-click buying is clearly what consumers want. CyberCash figured that out in July 1997. InstaBuy was a pretty cool product: HTMLand client-based, with one-click buying, shipping preferences, and serious security and operational data centers.

But the product failed completely. The fact that Seymour's column didn't refer to this failure is telling. I think InstaBuy failed for the same reasons that the SET (Secure Electronic Transaction) wallets Visa pushed a couple of years

"It will be interesting to watch and see if Microsoft's Passport catches on."

ago didn't catch on. Each product offered a solution to a problem that consumers didn't think they had. It will be interesting to watch and see if Microsoft's Passport catches on.

> PAT FARRELL via the Internet

### **VISIONS OF THE FUTURE**

Jake Kirchner's December 1 column ("You Only Think You Understand the Internet Age") is interesting, but I disagree with his idea that the future is "one in which you may choose one oven or car over a competitor's machine based on their relative abilities to respond to voice input and connect you immediately with customer service." Don't you think a better goal for the future is designing simpler and more rugged and robust devices that won't require service or assistance?

> R. ALAN MONROE via the Internet

### THE WEB HOST WITH THE MOST

I thank you for your "Web Hosting" evaluation (December 1), but I must admit that I almost screamed in horror when I turned the page and discovered you had chosen Interland as your recommended hosting company. I've been developing Web sites for four years, using dozens of different hosts, and Interland is by far the worst host I've ever dealt with. Its customer service and billings departments are excruciatingly bad. From keeping me on the phone for more than an hour once as I was bounced through seven clueless employees to poor connection speed to making unauthorized charges on my Visa card, Interland continued to ratchet up the pain to the point that I pulled all my accounts with them. After discussing the matter with other Web developers, I learned that my experience with bad service from Interland was hardly unique.

> RANDY GOERTZEN, Calgary, Alberta, Canada

### FINDING THE RIGHT PRICE

I was disappointed to find that your November 16 cover story "E-Shopping Spree" did-

n't include Price Watch (www.pricewatch.com) in your discussion of computer hardware and electronics prices across various sites. I usually buy my hardware items from smaller shops after finding them on Price Watch. The prices are always better than those of any one superstore, because Price Watch lists products from hundreds of stores, sorted by price.

> ZAREER SIGANPORIA via the Internet

What your readers should know about shopping bots is that the prices stated in the search results are not always the lowest prices. Shopping bots don't necessarily take manufacturers' rebates into consideration.

After reading your article, I used mySimon.com to search for the Intel PC Camera Pro Pack. My search found several matches and several prices. The cheapest was \$89.95 from Outpost.com. When I checked in the advertisement for further information, I found out that the stated price included a \$30 mail-in rebate from Intel. The same search results listed the next lowest price as \$99.99 from Egghead.com, which advertised the rebate, but Outpost.com didn't have the rebate figured into the listed price.

In the end, Egghead.com turned out to be the best deal at \$69.99. So even though shopping bots can find many different prices on the same product, you still have to do some true shopping.

> RICHARD LAVALLEE via the Internet

### STAYING SECURE ON THE WEB

In response to Matt Johnson's letter about security in your November 16 issue, I'd like

# **LETTERS**

to say that as an owner of an Intel Pentium III-based system. I think that the fuss over the processor serial number (PSN) is overrated. People who use the Web should be more concerned about cookies than the PSN. Most of the newer motherboards have a feature to disable the PSN; so if you really feel the need to hide or are that paranoid, disable it. But the cookies will still give you away.

LEE SLOSBERG via the Internet

### LIS FOR LAPTOP

In his "One Child, One Laptop" column (November 16), John C. Dvorak was out to recess. If socialized education is failing, what makes him think that socialized computing will fix or enhance it.

And a "ruggedized" laptop? Has he seen a child's backpack after a semester? Has he seen band instruments, which are packed in hard-shell cases, after a school year runs its course?

Then the icing on the cake, "All tests, writing, and note-taking would be done on the keyboard." Who pays the doctor bills for all the kids who have carpal tunnel ailments and vision problems by the time they're teens? Sorry, Dvorak, you get a D on this one.

Here's a better idea: Ban all computers from elementary school classrooms and teach the children how to use the computers that are sitting on their shoulders. Introduce computers in middle schools, and use them for specific learning tasks in high schools.

GEORGE J. P. LOCHNER Eagle River, Alaska

### **DIGITAL CAMERAS**

Your November 16 "Digital Cameras" evaluation was very informative, but you missed perhaps the most important feature in a digital camera—support.

Some cameras are virtual orphans, with poor or no support. I have a Nikon Coolpix 900 and need a replacement cable and software CD. Calls to one service number lead to another, and another, and another. Nikon's parts department is no help. Cables are not considered parts; they are accessories, sold by dealers only. Dealers say they need money in advance but can't get the software and aren't sure they can even deliver a cable. And nobody can tell me if the software upgrade on the Nikon Web site is complete or if it requires the original software CD.

CHRIS MARCHLEWSKI via the Internet

Your review of digital cameras was clearly not up to your high standards. After making statements such as, "Our jurors rated the images mostly according to personal preferences" and explaining that various digital sharpening

### **Corrections and Amplifications**

In our November 16 story "Setting Up Shop Online," we implied on page 139 that BigStep.com allows a maximum of 12 pages; it allows unlimited pages. We also said that you must set up a merchant account through the site. If you don't want to conduct online transactions, however, you don't have to set up a merchant account.

In our December 1 review of the Micro Express MicroFlex-72A desktop PC (page 150), we listed incorrect company information for Micro Express. The company is based in Irvine, CA, its phone number is 800-989-9900, and its Web site is www.microexpress.net. Contrary to what we indicated in the review, you can order directly from Micro Express's site, and its ratings on our PC Magazine Labs Scorecard should have been Fair for Web support and Good for buying online.

In the contributors' box on page 168 of our "Speech Recognition" story (December 1), we listed only the subtitle of one of Dan Newman's books. He is the author of The Dragon NaturallySpeaking Guide and Talk to Your Computer.

In our Holiday Gift Guide (December 14), the screen shot on page 232 captioned "Vampire: The Masquerade—Redemption" is actually a screen shot from the game Quake III Arena.

In "CD-RW Hits the Road" (December 14, pages 60-61) we listed an option for one of the CD-RW drives we reviewed that is not available. There is no \$49.95 battery pack option with the Micro Solutions backpack bantam cd-rewriter.

and color brightening techniques appealed to some jurors but not to others, you go on to say that any one of the top cameras could have been the top scorer. You then state that since image quality is highly subjective, you used more objective criteria in picking the winners: features and price.

Next comes a very unobjective analysis of camera characteristics, such as battery life and memory capacity, and a complaint that manufacturers are now adding so many complex features, each with its own UI standards, that you "venture out of default mode at your own peril." Only in the sidebar about accessories do you discuss the many important facts that a digital camera buyer needs to know about memory cards and battery life.

MIKE DECHENNE Moraga, CA

### OTHER PEOPLE'S PRINTERS

In your November 2 "Personal Printers" story, you rated the HP Deskjet 882C printer, which I own, highly. I agree. I upgraded several weeks ago from a cheap came-with-the-computer model. I just adore the 882C. It does beautiful cards and banners, and photographs are stunning. I recommend it to any not-socomputer-literate person (like me), since it is also quite dummy-proof, and yes, the color cartridges last forever.

JOANNE DEGIOVANNI Reynoldsburg, OH

When testing printers, are you are keeping track of any statistics regarding how a printer affects the PC when it is printing? I ask this question, because you have written so highly about the HP DeskJet 895Cse printer. I agree this is an excellent printer as far as speed, paper handling, and color are concerned, but it has a problem with the drivers. Try giving the printer a 30-page report to print, and then try to use your PC. The drivers seem to completely take over the CPU usage of the PC. HP knows there is a problem and has made

many suggestions as to how to correct itmostly suggesting you use much older drivers for other HP printers (you lose a lot of function of the 895CSe when you do this). After waiting a number of months for HP to correct this problem, I corrected it the hard way, by slowly replacing the printers in our office.

> JANICE R. FIELDER via the Internet

We measure the return-to-application time with the Quality Logic test system (the results are mentioned in the Performance Tests section of the Personal Printers story), but we currently do not test CPU utilization. Running our CPU utilization utility in the background during printing, however, could provide some useful information and is something we will try to implement in the future.—Ed

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# (PC Sold Separately)











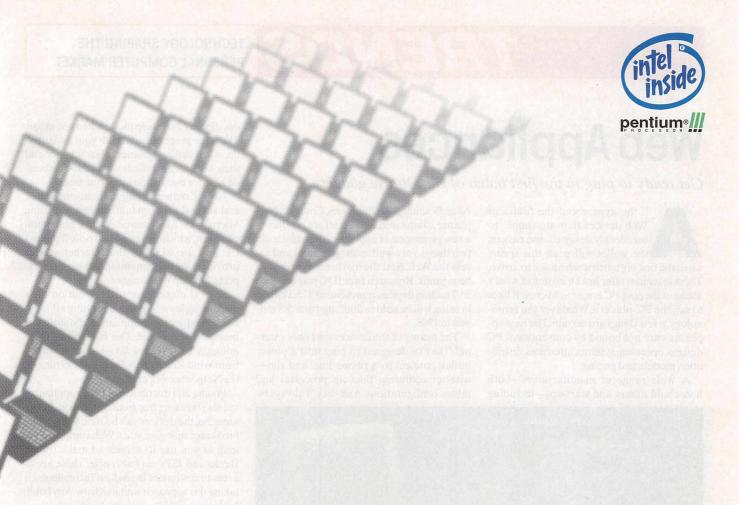




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ll the hype about the future of Web devices that are simple to use, sleekly designed, and easy on the wallet will peak this spring when the first big batch is scheduled to arrive. These machines offer just an inkling of what's ahead in the post-PC era, or as Microsoft likes to say, the PC-plus era. Whatever the terminology, a few things are certain: The new appliances are not bound by conventional PC designs, operating systems, interfaces, distribution models, and pricing.

A wide range of manufacturers—both household names and start-ups-including

Acer, Boundless Technologies, Compaq, Netpliance, Simpliance, and Vestel are producing a new generation of appliances designed to do two things very well: manage e-mail and access the Web. And the market is expected to be gigantic. Research firm IDC projects that 55.7 million devices, representing \$15.3 billion in sales, will be sold in 2002, up from 5.8 million in 1998.

The beauty of the devices isn't only external. They're designed to plug into a power outlet, connect to a phone line, and runwithout confusing boot-up processes and messy configurations. And they'll always be on, slipping into sleep mode when not in use. They'll be preconfigured with your e-mail address and dial-up Internet access number, and their wireless keyboards will include dedicated keys for e-mail and other functions.

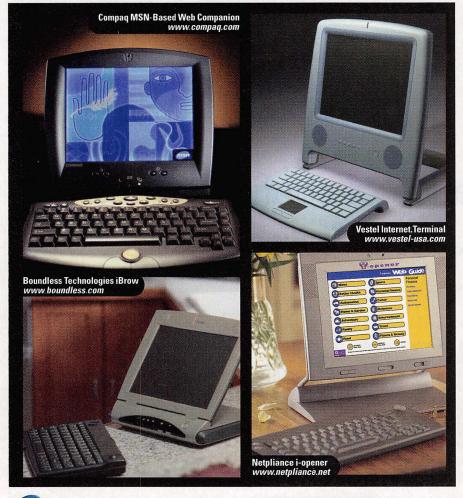
Acer, Compaq, Philips, Thomson, Vestel, and several other manufacturers are using Microsoft's MSN-based Web Companion platform, which will run Microsoft Windows CE and use MSN as the Internet service provider. Web Companion devices are expected to ship this summer.

Several players are striking out on their own, using lesser-known operating systems. For example, the Simpliance eMailBox is based on AppForge. The Boundless Technologies iBrow uses Java-based vxWorks, from Wind River, ONX Realtime OS runs on the Netpliance i-opener.

Pricing and distribution of Web appliances are also breaking free from convention. In one scenario, the devices will be free; your online brokerage may give you a Web companion as long as you use its service to make trades. Banks and ISPs may also offer these appliances to customers. Boundless Technologies is taking this approach with its iBrow. Any bank, brokerage, or ISP—any site, for that matter can brand the device with its own logo and distribute the appliance to its online clients. Sites distributing iBrows can also customize them to take online clients directly to selected Web sites, update the appliances with sponsor links and software upgrades, and use other personalization features to help retain customers.

Other manufacturers plan to sell their Web appliances at low prices and charge monthly fees for Internet services. For example, the eMailBox costs \$99, plus \$8 per month for Internet service provided by Simpliance.net. The Netpliance i-opener costs \$199, plus \$21.95 a month for Web access.

Despite the advantages, Web appliances aren't likely to be the PC's death knell. In fact, the consumer PC market remains quite lively, growing 57 percent from the second quarter of 1998 to the second quarter of 1999, according to IDC. The number of U.S. households with PCs surpassed 50 percent last year, with 25 percent of these households owning more than one PC. A Web appliance will be just one of the many computing and communications devices-from Internet cell phones to Internet game consoles—that will keep you connected in the new millennium.— Carol Levin





More Trends Online ● Thin transistors for portable devices ● E-rights legislation ● Small business on the Internet Plus: expanded versions of the stories in this section www.pcmag.com/trends

ou've seen the ads. Click here and get a \$10 rebate. Click there and win a \$50,000 car. They're tempting, and as far as attracting traffic goes, they're successful. Promotional campaigns on the Web range from sweepstakes to large discounts and free stuff, but the efforts may not be attracting the kind of customers who will keep coming back.

"There's no question that free promotions work in terms of attracting traffic," says Mike May, an analyst at market research firm Jupiter Communications. "However, sites that rely heavily on promotions and don't target them at the customers they want end up conditioning customers to expect promotions on



a regular basis. It's hard to convert them to paying the full price," he says.

According to Jupiter, 93 percent of commerce sites use promotions, and 76 percent of these sites use them specifically to attract customers. Many of these sites, however, fail to consider that traffic by itself has no

intrinsic value, whereas getting customers to interact with the sites and building brand loyalty will eventually be far more profitable.

According to May, Amazon.com is a good example of a site that handles promotions well. It doesn't run storewide sales or limited offers but competes, with low prices on all products. When Amazon uses coupons, it targets specific customer segments, encouraging current customers to shop in new categories.

One approach pays customers to browse sites and advertisements. All Advantage.com and eLiberation.com pay browsers based on the number of advertisements they click on. However, these browsers don't necessarily fit the demographic profile that advertisers really want to target.

As for sweepstakes, they may be very effective as prospecting tools for new customers, but many sweepstakes give away prizes wholly unrelated to the sites themselves. As a result, participants may be more interested in the prize than in the site.—Sharon Nash

## How to Drive a Printer



never even think about them, but you should. As you can see in the accompanying output samples from a single printer,

adjusting settings can affect quality dramatically. Driver settings are a key issue whenever PC Magazine Labs tests printers, but figuring out which are the right ones is never easy.

To get the most out of any printer you have to experiment with it, find out the effect each setting has on both speed and quality for different kinds of output, and make a decision about which settings to use, rather than simply accepting the defaults.

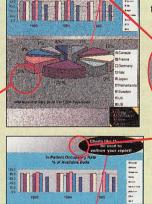
The best settings often depend on what you're printing. Settings that print acceptable text may produce unacceptable graphics, settings that print acceptable graphics may not print photos well, and settings that print acceptable photos may print text too slowly.

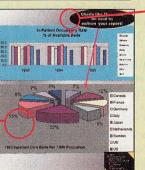
Settings that give better quality—such as higher resolution or edge enhancementtypically slow down the printer, but there are exceptions. The Tektronix Phaser 560 prints better-looking photos at 600 dpi than at a slower 1,200 dpi. (But it prints its highest-quality graphics at 1,200 dpi.)

Complicating matters further is the fact that manufacturers, such as Canon, Epson, and Hewlett-Packard, have increasingly moved to driver interfaces that hide what the printer is doing. This gives the impression that

the printer is easy to use. Instead of finding clearly labeled choices for resolution, edge enhancement, and type of dithering, you're more likely to find settings for Quality and Speed (as in the Epson Stylus 900, for instance), with more than one

15%





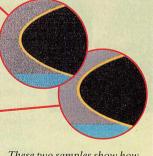
Printer drivers. Chances are you choice for the same resolution and with each choice changing several unexplained settings. You'll have to dig deeper into the driver to find the more basic settings, if they're available. With the Epson 900, you have to choose Custom, then click the Advanced button.

> Even more confusing is the fact that the meanings change depending on other settings. With some Epson printers we've seen, if you set the driver for Plain Paper, you'll get 720 dpi when you choose the highest Quality setting. Change the media setting to Photo Quality Glossy Film and you'll get 1,440 resolution at the highest Quality setting.

> Most ink jet printers offer a semiautomatic mode for driver settings, with a choice of two or three quality settings. Some Epson drivers offer slider bars with three settings: Quality, Speed, and something in between. An HP driver offers Econofast, Normal, and Best. In most printers, the fastest mode is what we'd call draft quality, and the highestquality mode is the minimum we'd use for graphics. (Some drivers call the highestquality mode a photo mode.)

> At a minimum, you should print a simple text document, a newsletter-style text document with different font sizes, a graphics document, and a full-page photo at each semiautomatic setting. Then compare the quality and print speed of each mode, decide which you prefer for each kind of output, and decide which mode you want to make the de-

> > fault for most print jobs. Try similar experiments with the driver's custom or manual settings.— M. David Stone



These two samples show how output quality can change with different driver settings. The sample on the top (lowquality settings) shows banding, whereas the one on the bottom (high-quality settings) does not. Note the ragged line compared with the smooth line.

# No-Hands Web Surfing

licking your way around the Web may seem like second nature to you, but you may want to try voice browsing. Though voice browsing isn't likely to banish the keyboard and mouse, it could be a viable alternative for newcomers.

Until now, speech recognition has been primarily about dictating documents, but the Internet has opened a door to speech-enabled services. At the most basic level, browsers such as Conversa Web (www.conversa.com), IBM's Via Voice Web, and Philips Electronics' FreeSpeech Browser (www.speech.philips .com) let you activate Web links by speaking to your Web browser and use voice commands such as "Go back" and "Refresh."

But what if you're looking for a ski holiday in Colorado or a recipe for chocolate mousse pie? That's where more advanced services come in. Spridge, a spinoff of Philips, recently introduced mySpeech Scout (www.myspeech.com), which retrieves information such as stock quotes, news, sports scores, and weather forecasts when you issue requests verbally. At the mySpeech Web site, you register for your personal version of a speech input button, customized with your favorite Web sites.

MySpeech Scout can also act on verbal commands such as "Weather, Las Vegas?" or "Television, tomorrow evening, movies."

One Voice (www.onevoicetech.com), which is based on IBM's ViaVoice, goes a step farther by letting you converse more naturally with your Web browser. One Voice can carry on a conversation that goes something like this:

You: "Computer, I'd like to look up the price of a stock."

Computer: "Are you looking for a specific company?"

You: "Yes. The company's name is the Ford Motor Company."

> Computer: "Okay. Do you know the stock symbol, or should I look it up for you?

You: "Please look it up."

Computer: "Ford is trading up 1 percent, with a current bid of \$51.50. The ask is \$52.

According to One Voice, the technology-called IVIT (Intelligent Voice Interactive Technolo-

gy)-draws on a database of topics and associated questions and uses linguistic concepts such as topic, subject, synonym relations, and inferences to ask relevant questions that clarify requests.— Carol Levin

# Ergonomics Regs Should Be About Bones, Not Bucks



Jake Kirchner

rdinarily, I stand united with anyone who abhors bureaucratic inertia and unneeded regulatory interference from Washington. But even I am taken aback at the vehemence with which industry groups are fighting proposed federal regulations on ergonomics in the workplace.

Despite evidence that hundreds of thousands, perhaps millions, of U.S. workers are injured on the job every year—because of poorly designed workstations, overuse of computers, or too much bending and heavy liftingbusiness groups such as the U.S. Chamber of Commerce have all but threatened to drink poisoned Kool-Aid if these regs go into effect later this year as planned. Their obvious concern for money over the health and wellbeing of their employees is unseemly.

And yes, the money involved is considerable. The Labor Department's Occupational Safety and Health Administration (OSHA), which proposed the new rules, says 1.8 million workers suffer "work-related musculoskeletal disorders (MSDs) such as back injuries and carpal tunnel syndrome" every year. Employers pay between \$15 billion and \$20 billion in workers' compensation for these disorders every year, and other expenses associated with MSDs may increase this number to between \$45 billion and \$54 billion a year. Implementing the new regs will cost industry \$4.2 billion a year but reduce lost work and compensation costs by \$9 billion annually in the process, OSHA says.

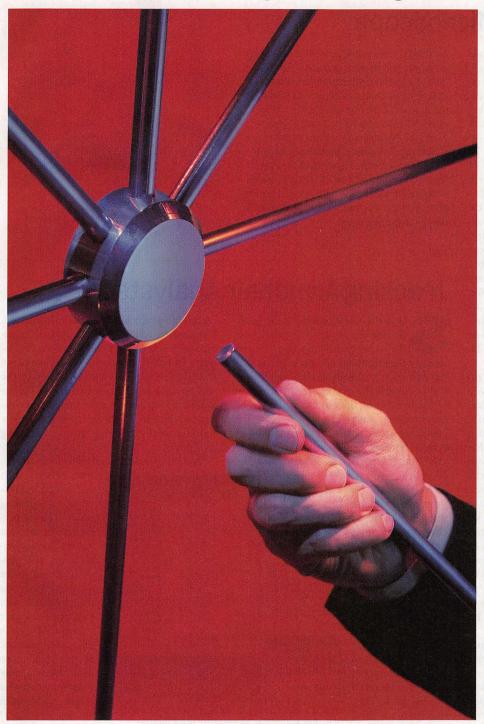
Implementation costs, while expensive, are little enough to compensate workers for what Labor Secretary Alexis M. Herman called "the most prevalent, most expensive, and most preventable workplace injuries in the country." The U.S. Chamber of Commerce, however, says there's not enough scientific proof of such injuries and wants OSHA to hold off until a National Academy of Sciences ergonomics study can be completed, about a year from now. The OSHA regs, the Chamber said, "would cost billions of dollars, yet the benefits—if any—are uncertain."

Even if you allow for a good dose of partisanship in Secretary Herman's statement that "real people are suffering real injuries that can disable their bodies and destroy their lives," anyone who has worked with computers or done work that involves physical labor knows there are real dangers involved and real injuries suffered. It's clear that the industry opponents are baldly worrying about their money and not about their workers.

Actually, industry gets off pretty lightly under the proposed rules (www.osha-slc.gov/ergonomics-standard), because the regulations don't mandate convoluted or burdensome national ergonomic standards. Rather, they specify that whenever a worker is injured on the job, certain steps have to be taken to make sure the workplace is made safe and that the injured worker gets medical treatment. Most people will find that approach reasonable.

The rules are in a period of public comment, and public hearings begin next month. Final regulations will go into effect by the end of the year, unless the Chamber and its allies succeed in pressuring Congress to delay or kill the proposal. There are probably a number of changes to the regulations that are worthwhile and might save money while still helping to protect U.S. workers. Groups representing employers would have a better chance of getting such changes adopted if they left their naked greed behind when they came to the debate.

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## You, Under The Microscope

ver feel as if someone's keeping track of your every move? If you spend much time online, that feeling may not be simple Kafkaesque paranoia. With online marketers increasingly focused on personalization—what boils down to recording consumers' preferences for marketing uses—it's getting harder to be anonymous online.

Sony Entertainment recently had a PR problem when a glitch that permitted advertisers to obtain the e-mail addresses of its InfoBeat e-mail service subscribers was discovered. InfoBeat has about 2.5 million subscribers, who receive free, customized, daily e-mail updates on news items, stocks, sports scores, entertainment, and music. Subscribers request the updates for certain content categories, and the e-mails contain links to Web addresses for various advertisers on the InfoBeat service. Their clicking on those links allowed advertisers to obtain the e-mail addresses of the subscribers. Sony says it has fixed the problem.

Sometimes those who care most about privacy have the most to hide. Sony's privacy woes came only a matter of days after Real-Networks raised the ire of many users of its RealJukebox. RealNetworks had been capturing and tracking data about the music files (such as MP3 files) that its customers downloaded from the Web. Many MP3 files on the Internet don't legally belong there, and those who download them shouldn't be doing so. The list RealNetworks compiled wasn't just perceived as another encroachment on personal privacy but a potential whodunit list of electronic music pirates. RealNetworks ended up rewriting its privacy policy in response to protests.

The FTC recently conducted a study on Internet privacy. Here are some of the key findings:

- Only 9.5 percent of surveyed Web sites provide consumers with privacy notices that meet the standards called for by the FTC.
- Only 65.7 percent of surveyed Web sites are providing consumers with some information about the use of personal information; the rest provide no information.
- 92.9 percent of the sites surveyed were collecting some kind of "personally identifying information."

The good news is that there's a growing stable of software tools to help detect where your personal information may be going. For example, LanDecoder 32 and LANSleuth both decode IP packets and provide information on where the packets are sent. Net Analyzer, for users of Microsoft Windows NT 4.0, captures and decodes packets passing through the Ethernet adapter on a Windows NT machine. After a packet is captured, it's displayed on-screen, providing a picture of what information about you is being sent where. There are also several freeware programs you can use to disable cookies, which encapsulate personal information about you and exchange it with Web sites.— Sebastian Rupley



### INTERNET

# Tracking Armchair Analysts

uccessful-stock-picking stories bear a striking resemblance to fishing tales. We've all heard that boastful colleague bragging about making a 300 percent return on shares of Widgets.com. So why is he still working in the next cubicle? Perhaps he forgot to mention the nosedive taken by his previous pick. Amateur online analysts you encounter in chat rooms are often equally unreliable, but now there's a way to keep track of their actual success rates. A new site called

iExchange.com, backed by idealab!, promises to make sense of the financial confusion that online trading has brought about.

Here's how the iExchange system works: Analysts post their stock picks in a report, including a target price, a date by which the stock will hit the target, and a brief rationale for the pick. They can charge a small fee (usually around \$1) for the report, or

give reports away for free. For each pick, the iExchange Ranking System tracks the average rate of return, directional accuracy, and predictive accuracy. The analysts that perform best are highlighted on the site.

"We're trying to create an orderly and ac-

countable place for financial information. Our scoring system holds analysts accountable for what they've said," says David F. Eisner, CEO of iExchange.com. In some cases, the investment performances posted by the analysts at iExchange are quite good. For example, the top analyst at the time of this writing has picked 15 stocks in the past few months, with the average pick gaining 35 percent.

You can search for particular stocks or ana-

lysts, and the results are ranked and listed in descending order. Analyst performances, broken down by several criteria, are also provided. Thus, if you're a risk taker, you might value a high rate of return over occasional lapses in directional accuracy. If you are more cautious, you may want someone who is mostly correct in making directional predictions, even if the rates of return



REALITY CHECK: Visit iExchange.com to find out whether your favorite amateur stock analyst really knows what he's talking about.

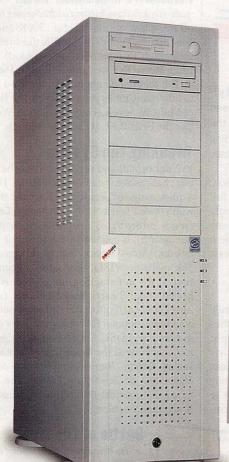
are not always the highest possible.

For now, iExchange doesn't tell visitors how to use or interpret the scores. Future updates may include recommendations, online chat, more detailed analyses, and simplified analyst information — Sharon Nash analyst information. - Sharon Nash



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# **High-Speed Browsing**

By Alan Cohen

o ahead, admit it. There's one part of the job you really do want to take home every evening: the fast Internet access. You could grab MP3s, watch videos, or trade digital photos with the family. Of course, you can do all that with a 56K modem. You can also take a nice long nap while it's chugging along. That's why broadband is one technology that has earned its buzz. Ready to sign up? Not so fast. Cable



modems and DSL services aren't available everywhere. Indeed, consider yourself lucky if even one of these has made it to your neighborhood. But things are looking up: As cable and telephone companies upgrade their networks, broadband is gradually making its way to the masses. You'll want to be ready when the fast pipes arrive—and that means understanding the capabilities, the shortcomings, and the potential benefits of high-speed Internet access.

### **Broadband Basics**

> DSL turns existing telephone lines into high-speed data carriers—but only over short distances. The further you are from the telephone company's central office (where the DSL equipment is installed), the worse the performance. Typically, if you are more than three miles away, you won't be able to get DSL at all. There are different flavors of DSL, too. The most popular option for home users is ADSL, which trades slower uplink speeds for faster downloads. These and other DSL basics are nicely spelled out at **DSLreports** (www.dslreports.com).

Cable modems tend to cost less than DSL, but they have their limitations as well. Right now, your choice in providers is limited to your choice in cable companies. Also note that although DSL service is private—guar-

anteeing that bandwidth never falls below a certain level—cable Internet access is shared by everyone on your cable line. The more neighbors downloading Quake, the slower your performance. For a concise background on the two technologies, visit whatis (www.whatis.com). And for a quick comparison of DSL versus cable, check out Cable Modem

Help (www.cablemodemhelp.com).

To find out if high-speed Internet access is available near you, check out Getspeed.com (www.getspeed.com) and 2Wire (www.2wire .com). 2Wire has the slicker interface, but it

also asks for a lot of personal information, such as your name, e-mail address, and full telephone number. Getspeed requires only your address, area code, and phone exchange. It will also tell you if cable modem service is available, though it missed at least one New York City provider (RCN).

### **Content** is King

➤ Once you've got all that bandwidth, you'll want to take advantage of special Web sites built specifically for broadband users. Stop at **Scour** (www.scour.net) for a festival of movie trailers. Scour's high-bandwidth videos mean large but clear displays-not those puny windows where everyone looks like they're swimming underwater. For film buffs, a number of sites bring the art house

to the desktop. Atom Films (www.atomfilms .com) features a large library of animations and short films. Also worth a look is Shortbuzz.com (www.shortbuzz.com) a free venue for aspiring Scorseses to screen their work.

Alas, broadband content-like broadband itself—is still a work in progress. VideoSeeker's Hi-Bandwidth Theater (www .videoseeker.com/hibandwidththeater.html) offers clips optimized for 300K-and-up connections (good), but it fills the site with lame celebrity interviews (not so good). And while MovieFlix (www.movieflix.com) serves up full-length documentaries, there's a limit to how many times you can watch The Battle of Midway-even at high resolution. We did like the Felix the Cat cartoons, though.

### Tweaking the System

> Your broadband connection may be fast, but chances are it can be even faster. To get a quick gauge of performance, try the Bandwidth Speed Test at MSN's Computing Central (www.computingcentral.com/topics/ bandwidth). It calculates the speed of your link and shows you how it stacks up against a 56K modem, an ISDN line, and a T1 connection. If it's not stacking up as well as you hoped, take heart: SpeedGuide.net (www .speedguide.net) offers free software patches containing optimal Registry settings for cable modems and DSL. Speed-boosting tips are also available at the Navas Cable Modem/DSL Tuning Guide (http://navasgrp.home.att.net /tech/cable\_dsl.htm#QuickEasy). The talk here gets technical, but step-by-step instructions guide you along.

### **Battle of the Pipes**

> As broadband technology takes shape, so does the controversy surrounding high-speed access. Many Internet service providersnotably America Online-want access to the cable lines, arguing that it is unfair and harmful to consumers that a cable company's ISP have a lock on all the users connected via that line. In courts and legislatures around the country, the fight for "open access" is raging. You can fol-

low the issue at the Broadband Bob Report (www.catv.org/bbb-report). For arguments in favor of open access, visit the openNET Coalition (www.opennetcoalition.com); for arguments against, visit hands off the Internet (www.handsofftheinternet.org). For the final word, however, stay tuned.



A high-bandwidth connection can give you access to sites such as VideoSeeker, which provides multimedia content-albeit relatively fluffy content for the moment. Consider it a work in progress.



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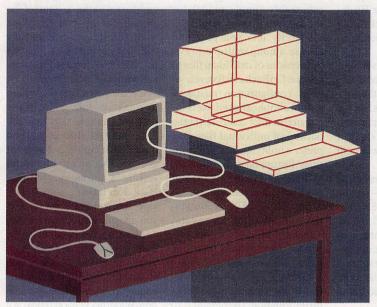
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## System Savings Time

When the clock runs out on your PC, a system recovery tool can take it back to when things were working smoothly.



By Larry Seltzer

any people are terrified of their computers. They worry that if they hit the wrong button, the whole system will somehow selfdestruct. Though the situation is not quite that serious, often we do damage to our systems that we wish we could undo. If only you could turn back the clock to the time when your computer ran just fine.

In fact, several utilities now let you do just that. Using one of these, you can literally undo anything on a Microsoft Windows system, in most cases even if Windows won't boot. These tools can be lifesavers when you install a new application that causes system problems. In addition, they are also handy for cleaning out your system when performance starts to degrade.

For this roundup, we tested five tools that take two basic approaches to system recovery. Wild File's GoBack 2.1 and PowerQuest Corp.'s Second-Chance 2.0 work in the background, creating a chronology of events so you can always skip back to a given point in time when your system was healthy. The other three utilities, imagine LAN's ConfigSafe Desktop Edition 3.0, DuoMark International's 9Lives 1.0, and LANovation's PictureTaker Personal Edition 2.0, rely on a manual method. You decide when to take a snapshot of your system configuration, which you can later use to restore that system. Along similar lines to disk-cloning tools such as Symantec Corp.'s Norton Ghost, you can even use these latter tools to apply images to other PCs.

Not all these utilities are designed for the same types of users. GoBack and Second-Chance are suitable for general users; ConfigSafe and Picture-Taker are more complex and

are best left to system administrators and advanced users, 9Lives is straightforward, but it is also more limited than the others. Adaptec's ReZoom (see the sidebar) uses a second hard disk to store a mirror image of your system.

It is important to note that system recovery tools are not a substitute for a good personal backup solution. Some system recovery tools save only configuration information, not your data. Others back up your data as well, but these

are intended to be only temporary backups, not permanent archives.

Nevertheless, these tools are so important that Microsoft is already building some of these features into its operating systems. The much-anticipated Windows 2000 has a feature called System File Protection that prevents a user or application from damaging critical system files. The forthcoming update to Windows 98, codenamed Millennium Edition, will include a full-fledged rollback feature.

Although these new features of Microsoft Windows will undoubtedly have an effect on this growing market, they won't provide all the features of a robust system recovery tool such as GoBack. All in all, we were quite impressed with these products. Though they do not deliver a foolproof solution to all computer woes, they can get you out of a jam.

#### **INTERNET EASE**

Dell hits the mark with its new, easy-touse webpc. Page 49.



#### **BOOKMARKS ON THE GO:**

Online bookmarks let vou take vour favorite links along

with you wherever vou go. Page 50.



### **E-BUSINESS CARDS:**

Manage your business cards electronically with the Corex CardScan Executive. Page 57.



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### ConfigSafe Desktop **Edition 3.0**

ConfigSafe Desktop Edition 3.0 (\$39.95 list), from imagine LAN, is a snapshot-based program for saving system configurations and displaying differences among them. By saving configurations before potentially hazardous operations, users can safely assume they can undo whatever damage may result.

ConfigSafe supports Microsoft Windows 95, 98, and NT (it's also designed for Windows 2000). The software comes bundled with all IBM PCs. We looked at the Desktop Edition, but the company also has a Network Edition, which lets you share the program and user profile information on the server, distribute updates centrally, and control the scheduling of snapshots.

ConfigSafe is architecturally similar to PictureTaker but easier to operate. Still, the program is not as accessible as GoBack or SecondChance; in most cases you have to invoke the snapshot process manually. Version 3.0 does include a new feature, however, called Install Guard, that automatically takes snapshots whenever you install a new program.

To test this feature, we installed several programs such as WinZIP, a popular file compression utility. In the case of WinZIP, the installation prompted Install Guard to bring ConfigSafe to life, but the feature failed to detect many other program installations.

A unique feature of Config-Safe is its ability to monitor and track changes in files on network disks. Unfortunately, tracking any files in ConfigSafe is not an obvious matter. By default, ConfigSafe tracks only configuration information, such as the Registry.

For example, we saved our initial "factory configuration" on a test system and then installed Symantec Corp.'s Norton SystemWorks. We then restored the factory configuration, but the SystemWorks files were still on the computer.

To track actual file usage so that it can be undone-in the way GoBack and Second-Chance do-you need to use the asset-tracking feature of ConfigSafe. This feature, however, is buried in the program and, once vou do locate it, is far more difficult to use than those found in competing products.

Despite some notable features, ConfigSafe Desktop Edition 3.0 is not the best choice for system recovery.

ConfigSafe Desktop Edition 3.0. List price: \$39.95. Requires: 8MB RAM; 11MB hard disk space; Microsoft Windows 95, 98, or NT. imagine LAN Inc., Nashua, NH; 800-372-9776; www.imagine-lan.com.

#### GoBack 2.1



Wild File's GoBack 2.1 offers the best combination power and ease of use of all the products reviewed here. GoBack presents a

reasonably simple model for storing system information, yet the utility lets you pick and choose among multiple previous versions of individual files to restore. GoBack can fix even serious configuration mistakes.

More sophisticated users interested in finer control over the backup of individual files may prefer a utility such as LANovations' Picture Taker, but GoBack (\$70 street) is the best choice for most users. For these reasons, it is our Editors' Choice for system rollback. (GoBack was also a Technical Excellence Awards finalist for Utilities. See our issue of December 14, 1999.)

GoBack reserves some portion of each hard disk for backup information. The default is 10 percent, which Wild File claims should last several days under normal operation. Install Microsoft Office 2000, however, and you'll quickly exhaust your quota. So choose this percentage carefully; GoBack doesn't let you change it later.

In the main GoBack program, you can view a linear chronology of file events on

your hard disk and safe points (periodic events where GoBack saved the entire state of the system). When a problem occurs, vou can revert completely to one of these safe points.

When you double-click on one of the safe points in the event log, GoBack creates a temporary virtual drive with the contents of the hard disk at the time of the safe point. This virtual drive looks just like another hard disk, so you can use Windows Explorer to view and manage GoBack files.

Even if you revert the system to a certain safe point in the past, you can return to GoBack and restore file changes that you made subsequent to that point in time. This incredibly useful feature is not unique, but Go-Back does it best.

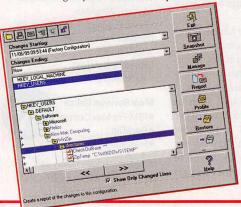
When you boot the system, you are presented with a menu and have a few seconds to hit the spacebar and enter a non-Windows version of GoBack, which is usable even if Windows is badly corrupted. But because the non-Windows version relies on a modified master boot record, you have to disable GoBack before using other tools that modify the boot record, such as PowerQuest's PartitionMagic.

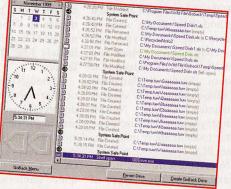
GoBack is not perfect. Like some other products, the utility pointlessly backs up temporary files such as Microsoft Internet Explorer's browser cache. Go-Back's filtering feature controls

**▼ SAFETY CATCH:** 9Lives is simple: When you enable Protected Mode, all changes on a specified drive are monitored so that the system can be restored.



**▼ CHANGE MANAGEMENT:** After you have made changes to the system, ConfigSafe makes it easy to display the impact on files and the Registry since the last snapshot.





▲ REVISIONIST HISTORY: GoBack lets you trace back through a log of file system events to find a point to which you may revert the system.

### **Editors' Choice**

### GoBack 2.1



System recovery tools seem like black magic, but the feats they perform are not illusions. And the utility in this class with the best bag of tricks is Wild File's GoBack 2.1.

As you work, GoBack is constantly watching in the background and taking notes in case something goes wrong. GoBack keeps a chronological list of system events, so you can turn back your system to any point in time. Though the program is accessible to users of all levels, it includes some powerful features, such as a DOS version of the program—useful when Windows won't boot.

Along with antivirus protection and personal backup software, GoBack 2.1 is an essential tool.

only which saved files you can view, not which files are actually backed up.

Wild File says a version for Windows NT and Windows 2000 is in the works. The company recently introduced a Professional version (\$90 street) that provides password protection and has a feature that automatically reverts your system to a "clean slate" based on a schedule.

To travel back in time and salvage your system, there's no better choice than GoBack 2.1.

GoBack 2.1. Street price: \$70. Requires: 16MB RAM, Microsoft Window 95 or 98. Wild File Inc., Plymouth, MN; 888-945-0881; www.goback.com.

### **9Lives 1.0**

A simple utility, DuoMark International's 9Lives 1.0 (\$49.95 direct) lets you protect a single copy of your system before you perform activities that could causes system problems, such as installing new software or hardware. 9Lives is far more limited than the other tools reviewed here, but its simplicity may appeal to some users.

The program has two modes: Normal and Protected. If you fear you may want to undo an action you are about to make, you enter Protected Mode, a process that unfortunately requires a reboot. When you decide to exit Protected Mode, (which also requires a reboot), you can either commit the changes that you've made to the hard disk or abandon them, returning the system to the state it was in before you entered Protected Mode. Unlike most other products reviewed here, 9Lives doesn't store multiple states; before and after are your only choices.

On a more positive note, 9Lives doesn't force you to set aside disk space in advance. Instead, it simply uses available disk space as needed so you can remain in Protected Mode as long as there is free space. Another advantage to 9Lives is that it doesn't affect the master boot record, so it gets along fine with popular utilities such as V Communications' System Commander and PowerOuest's Partition-Magic.

If you reboot while in 9Lives' Protected Mode, a DOS menu asks you whether to continue in that mode or return to normal system operation (the default is to continue in Protected Mode). Because this program runs in DOS, it gives you the chance to recover from some disasters that would prevent Windows from loading.

When you do exit Protected Mode, 9Lives automatically stores the changed files (the ones you "abandoned") in a folder labeled "8thlife." You can view and extract files from this folder just as you would any other using Windows Explorer.

Ultimately, 9Lives is an effective but primitive system recovery tool. The burden is on you to protect your system before doing something that might harm it. **9Lives 1.0.** Direct price: \$49.95. DuoMark International Inc., City, ST; 310-493-7711; www .duomark.com/9Lives.

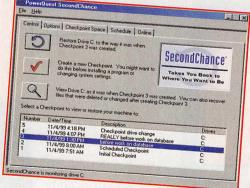
### PictureTaker Personal **Edition 2.0**

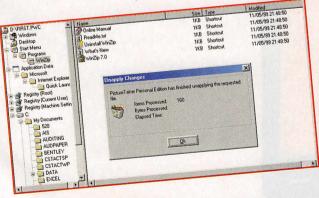
Like imagine LAN's Config-Safe, Lanovation's Picture Taker Personal Edition 2.0 (\$59.95 list) takes its own road. The utility's focus is not on returning the state of the computer to a known good one-like most of the other products reviewed here—but on capturing sets of changes in files and in the system configuration and bottling them up for later use.

PictureTaker creates both pictures and packages. Pictures are baseline snapshots of the state of a system. By default, Pictures contain only configuration information, not the actual file data. You could include the actual file data in a picture, but doing so would create unmanageably large files.

Packages, on the other hand, are sets of configuration differences between a baseline picture and the state of the ma-

**▼ POINT IN TIME:** You can create a series of checkpoints in SecondChance and restore your hard disk to an earlier state.





▲ MULTIPLE UNDO: If you use Picture Taker to apply changes to a system, you can then unapply them, effectively undoing the changes.

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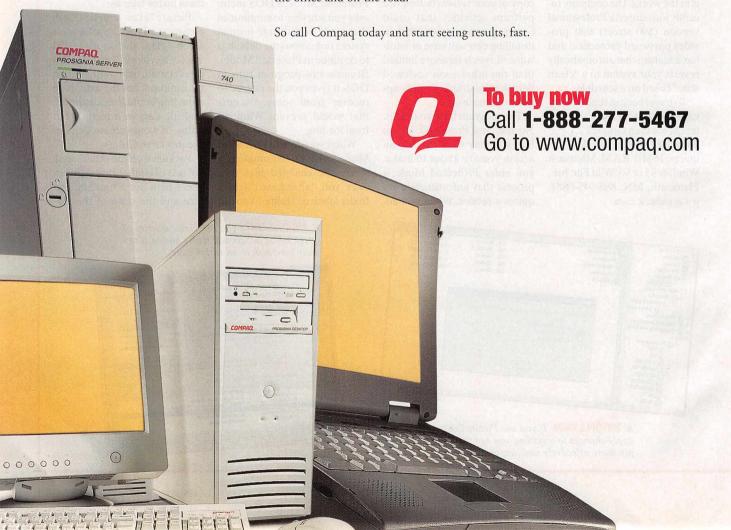
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chine. Even though they are compressed, packages can get rather large.

You might, for example, take a baseline picture on a system, then install a series of applications, templates, and data files. You could then create a package and use it either as backup or to copy the configuration to anoth-

Picture Taker is not as straightforward as the other programs here; the distinction between pictures and packages can be confusing at times, and the program has a vocabulary all its own. But the utility is powerful, and if you want detailed control over the configuration of their system, PictureTaker presents interesting possibilities.

The ability to examine the contents of packages and compare them means that you can use PictureTaker to determine the effect particular programs or individual functions of programs have on a Windows installation. This ability is valuable for debugging system problems, both for developers and administrators.

We created a complex Windows system and recorded the configurations and application

installations we made in two packages. Then we reinstalled Windows and reapplied the two packages, which returned the system to its fully configured state. Because we used the package method, we were able to unapply the packages as well.

PictureTaker Personal Edition 2.0 is definitely not for novices. Competent users, however, can use it to gain fine control over system configurations. PictureTaker Personal Edition 2.0. List price: \$59.95. Requires: 8MB RAM; 6MB hard disk space; Microsoft Windows 95, 98, or NT. LANovation, Minneapolis; 800-747-4487; www .lanovation.com.

### SecondChance 2.0

A direct competitor to Wild File's GoBack 2.1, PowerQuest Corp's SecondChance 2.0 (\$70 street) runs in the background and monitors file operations on a drive that you choose in the system. It's also fairly easy to use, although we did run into a few problems.

Checkpoints in Second-Chance are periodic events at which the software saves the state of the system and modified

files so that you can go back later and recover them. By default, checkpoints occur at 8:00 A.M. on weekdays. This seems to us to be too infrequent, but adding new checkpoints to the schedule is easy.

Should you need to revert the system to an earlier state or recover individual files, you can invoke the main SecondChance window from the tray icon or Start menu. You can select one of the checkpoints (listed chronologically), view the hard disk as it was at that point in a Microsoft Explorer-like interface, and either recover the entire system or individual files. Even if you recover the entire system to a particular point, you can also recover files that were created after that point.

SecondChance lets you stop its monitoring of any or all drives in the system, but the software still loads and can be accessed from the tray. Unless you know how to excise it completely from the Registry on your own, the only way to disable the program is to uninstall it.

We ran into trouble during testing when we attempted to install WinZIP 7 from a network drive: SecondChance crashed. taking down all of Windows with it. Running the same install from a local drive presented no problems. PowerQuest is looking into the problem.

SecondChance doesn't let you bypass Windows and boot directly into it, as does GoBack, but you can create a Second-Chance emergency boot floppy disk. The floppy disk worked well for us, and even if you misplace it you can boot to DOS on any floppy disk and run Second-Chance from the command line.

The utility has some advantages over GoBack, such as the ability to modify the amount of disk space reserved for checkpoints. It also will not back up the browser cache and can update itself directly from Power-Ouest's Web site.

If we hadn't run into some isolated problems, we might recommend SecondChance 2.0. With a little work, SecondChance could easily challenge GoBack for the top spot in the category of system recovery utilities.

SecondChance 2.0. Street price: \$70. Requires: 16MB RAM, 20MB hard disk space, Microsoft Windows 95 or 98. PowerQuest Corp., Orem, UT; 801-437-8900; www.powerquest.com. PC

### Adaptec's ReZoom

eZoom (\$79 list) is a different sort of utility. It lets you use a second, physical hard disk to save restored information for activity on the first disk. ReZoom was in late beta when we tested it and should be available by the time you read this.

The biggest advantage of ReZoom is that you can boot off the second hard disk if the first is in such bad shape that it's unusable. If the first disk is physically dead, you may need to open the box to

remove it, but for other errors ReZoom can switch the system over to the backup disk completely in software.

After installation, ReZoom repartitions and formats the second disk, which becomes usable only by ReZoom. The disk can be another IDE drive, or you can use SCSI drives if they are on an Adaptec adapter or another which supports INT 13 BIOS access to the drive.

The disadvantages of ReZoom are the cost and complexity



JUST IN TIME: ReZoom lets you schedule backups using a variety of criteria.

of adding a second hard disk. Another problem is that ReZoom rewrites the master boot record, so it is incompatible with most partitioning and multiboot software such as PartitionMagic or System Commander. And ReZoom requires four system reboots during a normal installation.

But there are definite advantages to ReZoom and its approach. ReZoom lets you schedule backups. One very cool feature is

ReZoom's ability to send an e-mail automatically to a designated address, presumably an administrator, if the utility finds an error. This feature worked well for us.

Clearly, ReZoom has some issues to work out. But as hard disk prices continue to plummet, Adaptec's approach may end up not being so costly.

ReZoom. List price: \$79. Adaptec Inc., Milpitas, CA; 800-442-7274; www.ReZoom.com.

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### Speed Is Good

Based on the latest technology from AMD and Intel, these two PC heavyweights are full of extras.

By John Morris

ho said today's PCs are fast enough? Despite the remarkable growth in sub-\$1,000 desktop PCs, many users are still out there—you know who you are—who have an insatiable need for the latest and greatest. Chip makers AMD and Intel are happy to oblige.

The heir apparents, in this case, are the 750-MHz AMD Athlon and the Intel 733-MHz Pentium III. Athlon-based systems generally use AMD chip sets and a 200-MHz system bus (the pathway between the CPU and the chip set). Intel's latest Pentium III chips are paired with the new Intel 820 chip set. which has a 133-MHz front-side bus and supports a faster type of memory (RDRAM).

To see how all this technology translates, we tested two new PCs: the Compaq Presario 5900Z-750, which uses the Athlon/750, and the Dell Dimension XPS B733r. Both deliver high levels of performance. The Dimension XPS B733r had the edge on tests that measure business and content-creation applications, as well as disk performance; the Presario 5900Z-750 excelled on floating point operations and some Internet applications (i-Bench).

Though Dell opts for a more conservative, beige-box design,

Compaq throws a few curves into its high-end system—both figuratively and literally.

### **Compag Presario** 5900Z-750

In this age of cheap computers, the Compaq Presario 5900Z-750 (\$3,460 street, as tested) sounds pricey. The Presario 5900Z-750 that we tested came test system included 128MB of SDRAM, a Creative Labs Annihilator graphics card (based on the GeForce chip set) with 32MB graphics memory, a 10/100 Ethernet adapter, and a 56K modem.

The Presario 5900Z-750 has two FireWire ports and twice the

Pop a DVD into the system and enjoy a movie with the 19-inch monitor and superb Klipsch Pro Media five-speaker audio system. But the speaker system was more difficult to set up than the Dimension XPS B733r's three speakers.

TITLE FIGHT: Both the Dell Dimension XPS B733r and the Compag Presario 5900Z-750 offer heavyweight performance and features.

chock-full of features, however.

For starters, it has a generous 34GB IBM Deskstar 34GXP hard disk (First Looks, December 14, 1999), a 10X DVD drive, and a 4X CD-RW drive. For music on the go, Compaq even threw in a Diamond Rio 300 portable digital audio player. More standard features in our

number of USB ports (four) as the Dimension XPS B733r. More important, two of these USB ports and one FireWire port are located on the front of the case. The Presario 5900Z-750's only real drawbacks are that the case is difficult to open and close and that it has a shorter warranty than the competition.

Compaq Presario 5900Z-750. Street price: \$3,460. With Athlon/750 CPU, 128MB SDRAM, 34GB hard disk, 19-inch monitor. Compaq Computer Corp., Houston; 800-888-0220; www .compaq.com.

### **Dell Dimension XPS** B733r

From a design standpoint, the Dell Dimension line has never been the sort of product to turn heads-but in its own way has achieved great success by integrating leading-edge technology into reliable, well-equipped systems. The line's new flagship system, the Dimension XPS B733r (\$3,069 direct, as tested), carries on that tradition.

Inside its standard-issue beige box, the Dimension XPS B733r contains the latest Intel technology—including the 733-MHz Pentium III, the 820 chip set, and 128MB of PC800 RDRAM. Dell rounded out our test system with a 20.4GB hard disk, an 8X DVD drive, an Iomega Zip 100 Drive, a 19-inch monitor, and a 56K modem (a network card is a \$49 upgrade). Like the Presario 5900Z-750, our test system came with a 32MB graphics card based on the nVidia GeForce.

Although the Internet buttons on the keyboard are useful, the Microsoft Natural Kevboard is too complicated for our tastes. On the other hand, the Harmon Kardon HK 595 speaker system was simple to set up and was more than sufficient.

Dell backs it all with a threeyear warranty and round-theclock support. The Dimension XPS B733r, although not as ambitious as the Presario 5900Z-750, is tough to beat.

**Dell Dimension XPS B733r.** Direct price: \$3,069. With Pentium III/733, 128MB RDRAM, 20.4GB hard disk, 19-inch monitor. Dell Computer Corp., Round Rock, TX; 800-388-8542; www.dell.com.

### **BENCHMARK TESTS**

High-	End	d D	A			¥-	ZD i-Ben	cel
▲ High scores are best. ▼ Low scores are best. Bold type denotes first place.	ID Busing	ione 99 Conte	introduce in the state of the s	TO FRUNI	Davinst	Post out	aletones Performance	techia Androse
Compaq Presario 5900Z-750	28.7	28.1	52.2	4,070	4,960	18.5	10.3	83,023
Dell Dimension XPS B733r	30.2	29.7	52.21	3,855	5,670	18.9	12.8	73,032
Micron Millennia Max PIII 733/133 <sup>2</sup>	31.3	29.2	N/A	N/A	N/A	N/A	N/A	N/A

We ran all tests at 1,024-by-768 resolution with true color. (1) With updated graphics drivers and Microsoft DirectX. (2) Reviewed December 1, 1999; reported for comparison. N/A-Not applicable: We did not run the test on this machine

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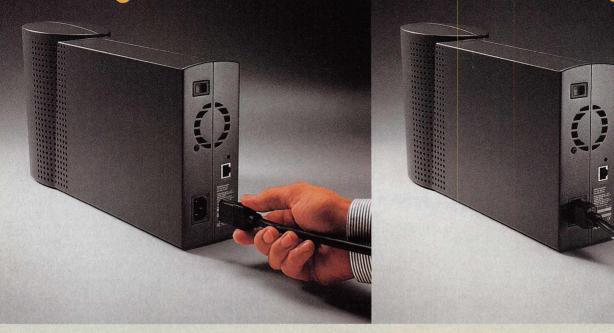


Oct. '98

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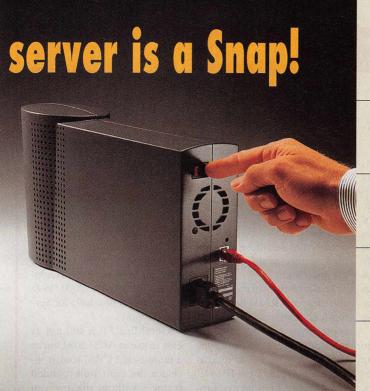
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20GB - \$999

40GB - \$1799





### Track Your Customers

GoldMine 5.0 adds new features that make this customer relationship management tool easier to use.

By Greg Alwang

nown as a stalwart workgroup contact manager with loads of high-end features, GoldMine has been branded as being difficult to use. GoldMine 5.0 (\$199 list) addresses this with new ease-of-use features on top of improved contact, opportunity, and marketing management tools. A new multimedia tutorial, interface enhancements, and better integration with Microsoft Outlook help GoldMine bridge the gap between entry-level contact managers and high-end CRM (customer relationship management) systems at a fraction of the cost.

GoldMine is ideal for sales teams of 10 to 50 users who need to collaborate on sales projects and convey a unified message to customers. New document management features let you track templates for mailings, memos, and faxes. The Literature Fulfillment feature lets you schedule follow-up correspondence so the appropriate materials get sent to customers.

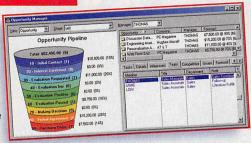
The simplified interface makes it easier to find commands, edit contacts, and even modify screens on the fly using the screen designer feature. Amenities such as auto-fill, auto-caps, and automatic duplicate checking ease data entry and reduce errors.

Businesses looking for more targeted features will like the new industry-specific templates with custom screens, reports, and marketing strategies. These templates let sales teams hit the ground running without getting buried in customizations.

The revamped Email Center supports public and private folders and encryption. Microsoft Outlook mail and contact and calendar items can now

#### DOWN THE PIPE:

The Opportunity Pipeline sums up projected dollar amounts in each stage of the sales process.



be viewed in GoldMine. New e-mail rules and filters provide mail management from within the program.

Traditionally strong at synchronization, GoldMine now offers fault tolerance so any interrupted sync packets are automatically resent. You can sync over a LAN, by e-mail attachments, or directly from IP to IP.

GoldMine's automated processes are a powerful means of covering all the bases of the sales process by letting you schedule multiple tasks to occur automatically-from requesting literature to sending faxes. To avoid network bottlenecks, GoldMine's Server Agents let vou schedule resource-intensive tasks for off-peak hours.

If businesses need to broaden the scope of their CRM services, they can easily scale up to Gold-Mine's FrontOffice 2000 (\$995) list for server plus \$895 for Service/Support).

GoldMine 5.0 is still not as easy to use as ACT! 2000, but as a team-based CRM tool, it includes the most well-rounded features without making you empty the coffers.

GoldMine 5.0. List price: For a single user, \$199; for a 5-user license, \$995. Requires: 16MB RAM; 65MB disk space; Microsoft Windows 95, 98 or NT 4.0. GoldMine Software Corp., Colorado Springs, CO; 800-654-3526; www.goldmine.com.

### At Home with HTML

HomeSite 4.5 adds split-screen editing and automated deployment to its code-based HTML editor.

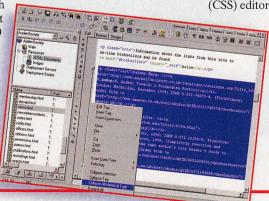
By Edward Mendelson

echnically savvy Webmasters still create and edit pages in raw HTML code, despite the attractions of WYSIWYG page editors. The code-based editor used by the savviest of Webmasters is Allaire's HomeSite (\$89 direct), recently upgraded to Version 4.5

and packed with enough new features to make it an essential upgrade (\$19 direct).

This new version retains the familiar twopane interface, with file lists, code snippets, site diagrams, and other resources on the left, and an editor on the right that can be switched among code, preview,

and a rudimentary WYSIWYG editing views. The code editor completes user-defined strings as you type them, lets you collapse parts of your code in the same way you can collapse an outline in a word processor, and supports a new split view that lets you edit two widely separated parts of the same file at the same time.



Site management is improved, with a "virtual folder" that lets you include files from local and remote folders in the same multifile project. A new deployment wizard uploads all files or only updated files to a remote server.

HomeSite now has its own built-in image-map editor, so you don't have to rely on third-party tools, and the old built-in stylesheet editor has been replaced with TopStyle Lite, a reduced version of Bradsoft's Top-Style 1.5 Cascading Style Sheet (CSS) editor. Even the reduced

> TopStyle is a superb CSS tool, with an accurate preview pane,

FALL IN: Selected text or a set of tags can be collapsed in the editing window to ease the task of working with the main structural elements on the page.

support for future CSS features, and spreadsheet-style CSS tag inspectors that look and act exactly like the HMTL tag inspectors in HomeSite.

Three different code validation systems are supported: a built-in validator, a CSE HTML Validator, and new to this version, the freeware HTML Tidy validator, which sometimes gets confused by comment lines and adds needless line-break tags. HomeSite now opens XML files but has no XML validation or parsing features, so you'll still need a third-party XML editor.

If you want total control over your Web pages, you'll choose a code-based editor, and HomeSite 4.5 remains the best of its kind. HomeSite 4.5. Direct price: \$89 (upgrade, \$19). Requires: 32MB RAM, 20MB hard disk space, Microsoft Windows 95, 98, or Windows NT 4.0 or later. Allaire Corp., Cambridge MA, 888-939-2545; www.allaire.com.

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5-Bay Highly Serviceable, Convertible Desktop

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Mid-Tower Case

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V.90 Modem<sup>3</sup>

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Integrated Intel 10/100 Twisted Pair Ethernet

17X min/40X max CD-ROM Drive

InforManager Server Management Software

3-Year Parts & Labor Limited Warranty with On-Site Service<sup>5</sup>

Year 2000 Compliant<sup>4</sup>

\$2799 or \$96/mo. 36 mos. business lease<sup>2</sup>

### ALR-Series 8200 Departmental Server

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### A Simpler Way to the Web

The Dell webpc is compact, stylish, and easy to use, and it features an innovative online help system.

By Carol Venezia

ince the introduction of the Apple iMac, we've seen one PC vendor after another introduce its own version of the "easy to use, easy to Web" computer. Now, Dell enters the fray with its new webpc, a small and stylish USBonly system that's totally focused on ease of use-from initial setup, to going online, to getting support.

Our testing showed that the webpc delivers on its promises: We set up the system, registered it, and got online through Dellnet (a year is included in the price) in about 13 minutes.

The webpc is different from any Dell machine vou've seen. This model is very small (just 10.5 by 6 by 9.5 inches, HWD), and is midnight gray in color. For \$29.95 (direct), you can get a different color—including purple, red, orange, or teal.

Unlike other Dell PCs, you can't configure this one to order. The company is offering three prebaked models ranging from the \$999 Dell webpc.fun model with a 433-MHz Celeron processor and a 15-inch CRT to the \$2,349 Dell webpc.blast system (tested for this review), which has a 500-MHz Pentium III CPU and a 14-inch flat-panel monitor. Each bundle also includes an HP DeskJet 610C printer with USB cable.

The display's base doubles as a stand/enclosure for the system unit. Just place the system in the stand (it's behind the panel), hook up the cables, and attach the curved, cable-concealing side cover.

With the webpc, Dell also debuts its e-Support program. Simply press the backlit "E" button on the front of the PC and you'll be taken to the e-Support home page. From there, you can launch diagnostics, get system information, or get help with preinstalled software. among other things. If you can't fix your problem, click on "Go to Assisted Service" to communicate directly with a Dell technician. We got a fix for our problem in about 4 minutes.

The Dell webpc does have its drawbacks, however. You can't connect anything but USB devices to it (it has five USB ports); the unit has no floppy disk drive; you can't install additional front-accessible devices (depending on which model you order, you get either CD-ROM or DVD drives); and you really can't upgrade the system.

The webpc's ZD Business Winstone 99 score (23.3) was on a par with those of similarly configured home PCs, and on our i-Bench test over a 56K connection, the webpc completed the Load Complex Pages test in 1 minute 47 seconds—fairly zippy for this configuration.

The small and stylish, affordable and easyto-use PC has already been done by Dell's major competitors for consumer sales. But the webpc does mark the entry of an important player into a hot market segment. And it squarely hits the mark.

Dell webpc. Direct price: \$2,349 with PIII/500 CPU, 128MB RAM, 13GB hard disk, DVD, 14-inch flat-panel monitor. USB

### DIFFERENT DELL:

The webpc doesn't look like your ordinary home PC. Designed to get on the Web fast, it is easy both to set up and use.

SuperDisk drive: \$139; USB floppy disk drive: \$69. Dell Computer Corp., Round Rock, TX; 800-433-9029; www.dell.com.

### Cooking with the Web

Internet appliances are finally here, but do they live up their promises? We test one of the first.

By John Morris

ubbed an Internet Personal Access Device, the Netpliance i-opener (\$399 direct) is a low-priced PC designed to do just one task: help families get on the Internet.

The i-opener barely resembles a PC. The compact unit consists of a 10-inch, SVGA LCD panel with integrated speakers, a 1.5- by 11.3- by 6.5-inch (HWD) base, and a full-size keyboard with a trackpoint and mouse buttons. You can swivel the LCD panel and mount the unit beneath a kitchen cabinet.

Netpliance offers two service plans: \$21.95 per month for unlimited, dial-up Internet access and, if you already own a PC, \$26.95 per month for unlimited, dial-up Internet access for both devices.

Netpliance has taken all of the hard work out of setup. The iopener comes preconfigured with a local access number and an e-mail account. Just plug in

Plzza The i-opener comes

preconfigured with everything you need, including a direct link to Papa John's Pizza. the AC adapter and phone line

and the i-opener jumps onto the Internet and downloads i-opener

All in all, the i-opener worked well, but the device does have some limitations. Some of these are built into the design: The unit doesn't run Windows applications, and expansion is limited to a single USB port.

Other shortcomings should be addressed. First, the i-opener doesn't offer the same support for multiple users as services such as America Online. Second, it doesn't offer the customization or services you'd expect from a portal: Popular tools such as instant messaging and calendaring are nowhere to be found. Third, the e-mail client offers no support for attachments. And

the browser supports audio (RealAudio only) files but not video.

Netpliance is by no means the only player in this game. AOL and MSN.com have forged deals with Gateway and Compaq, respectively, to produce Internet appliances—not to mention other start-ups, such as Boundless Technologies and Global Technologies..

But Netpliance has succeeded in producing one of the first Internet appliances that actually lives up to the promise of easy, affordable Internet access.

Netpliance i-opener. Direct price: \$199, plus service contract (\$21.95 or \$26.95) per month. Netpliance Inc., Austin, TX; 888-467-3637; www.iopener.net.

### Online Bookmarks

Blink, Clickmarks, and HotLinks let you take your Internet bookmarks with you.

By Alan Cohen

t may not be exactly like collecting Picassos, but putting together a comprehensive, carefully chosen set of Internet bookmarks is an art form in itself. The result: the Web's greatest hits, just a mouse click away-as long as you're on your own computer. Use someone else's PC and vou're stuck with someone else's favorite links. Or, at least, you used to be.

Enter the latest no-brainer concept to hit the Internet: online bookmarks. Just like e-mail, appointments, and files that you already store online, your prized URLs can be stored on a Web server, letting you access them from any browser, anywhere.

We looked at three such services: Blink (www.blink.com), Clickmarks (www.clickmarks .com), and HotLinks (www .hotlinks.com). A fourth, Bookmark City (www.bookmarkcity .com), was not available for testing in time for publication. All of these services let you transfer your bookmarks to a personal Web page, add new favorites, and organize your collection. But that's just the beginning.

These sites take advantage of the Web's two key attributes: its ubiquity and its power to foster community. To varying degrees, all let you share your bookmarks and contribute to a common database of links. Although these services claim to work with any version of Microsoft Internet Explorer or Netscape Navigator, you'll get best results with Versions 4 or later.

In almost every way, Blink stands out from the pack. Its community features are unrivaled. You can create a folder, fill it with links, and then share it with other Blink members, setting the level of access you desire: view links only, view and add links, or full ownership rights whereby links can be moved, renamed, and deleted. Blink's Public Library, a searchable knowledge base of user-contributed bookmarks, features a Yahoo!-like index.

Blink also makes it easy to export Web-based links back to vour browser. At Clickmarks the process is much more cumbersome-and HotLinks doesn't let you export at all. Finally, when it comes to organizing and sorting bookmarks, Blink again comes out on top.

#### Blink

Blink is the bookmark site to beat. With its tutorial, tabbed in-

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This rise is good for 24 hour a day news.
Welcome to How Stiff Works!
Welcome to Computers Hopers com
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Deal Ender Committee Surveys and Get Spodies! .BlinkBuys Business & Econom Entertainment & N... O + O Internet & Techno □ + □ Life & Travel AOL NetFind

**BLINK'S LINKS:** Blink offers a tabbed interface and buttons that simplify keeping track of links.

terface, and intuitive buttons, it's the easiest of the services to use. And with powerful link management and sharing capabilities, it's also the most sophisticated.

Log on at Blink's home page and you'll see a list of all your bookmark folders, as well as any links stored in the root directory. This structure is cause for our only significant gripe. Each time you click on a folder of links, Blink loads a new Web page to

ines your folder's name and suggests additional bookmarks from Blink's own database.

Sharing features are superb. When you create a folder, you can make it public, public but anonymous (meaning others can access the links but won't know their origin), or private. If made public and not anonymous, a folder will be listed at your personal Blink page, which can be accessed by any Blink member who searches for your



FAMILIAR FOLDERS: With collapsible folders, Clickmarks interface is similar to Microsoft Windows Explorer.

present that folder's contents. Clickmarks takes a better approach with expandable and collapsible folders, so all of your bookmarks can be viewed on a single screen.

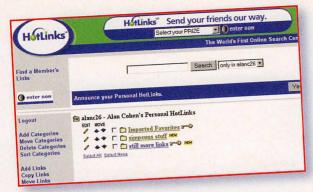
Blink offers a variety of ways to add new bookmarks to your online collection. If you're already at Blink, you can manually type in URLs. If you are at the site you want to add and not logged on at Blink, you can use the LinkAdder-a special bookmark Blink adds to your browser. Click on it and the current site's link is stored at Blink. Finally, if you're not on your own computer, there's Blinker, an applet that downloads from Blink's site and runs in any browser.

Blink lets you sort your links alphabetically or by hits, last use, category, rating, or date added. You can drag and drop bookmarks from one folder to another and highlight important links. A related-links feature examuser name, real name, or e-mail address. Visit another member's page and you can add that user to your well-integrated address book. You can also append any of their shared folders to your own directory and track new links-meaning that a link added to a shared folder will be added to your own collection. Blink. Price: Free. Blink.com Inc., New York; 212-792-4145; www.blink.com.

#### Clickmarks

Like Blink, Clickmarks offers three ways to add links: by entering URLs at the Clickmarks site, by a special bookmark stored on your PC, or by downloading an applet—the Floating Link Adder-from any browser. But features are less elegant here.

For example, when you import bookmarks, you have the choice of appending to your current Clickmarks collection or overwriting it. If you append,



HOT AND COLD: HotLinks lets you store bookmarks online, but it offers little else.

Clickmarks will add everything in your bookmark file-even those links it has imported previously. Fortunately, there is a utility to search for and delete duplicate links. You'll need it.

Exporting is similarly cumbersome. Netscape Navigator users must save their Clickmarks directory as an HTML file, which has to be loaded manually into the browser. Microsoft Internet Explorer users have a even worse setup: Links must be saved as Netscape bookmarks, then convertedvia a program you have to download-to IE favorites and loaded into the browser.

The user interface could use some work, too. Clickmarks lets you expand and collapse folders on the fly, but if you import hundreds of bookmarks, you'll find them spread over several pages. That's because Clickmarks sets a limit to the number of links it will display on one page. You can manually boost this limit, but it's an extra step you shouldn't have to take.

On the upside, there are some nice touches here. You can store password and user name information for sites you bookmark, so Clickmarks can automatically log you in (though saving passwords on a server en masse did give us pause). Links can be dragged and dropped between folders, and there is a handy undo command.

Community features, however, are limited. You can e-mail individual bookmarks and entire folders, but there is no address book. And though you can view folders other users elect to share, you can't append them to vour own directory, à la Blink. Clickmarks. Price: Free. Clickmarks.com Inc., Fremont, CA; 510-979-2010; www.clickmarks com

### **HotLinks**

HotLinks wants to offer your bookmarks to the world-even if that's not quite what you had in mind. Input your links, and they are made public and attributed to you. You can manually reset bookmarks to private, but maybe not before your friends learn about your Britney Spears obsession.

Your public page—accessible to anyone who searches for your name-will list your e-mail address by default. You may want to change this setting.

Given how forcefully Hot-Links pushes sharing, we were surprised to find limited community-building features. You can search public folders, but if you

want to add a link to your own collection, you have to call up the site and manually add it. There is also no Web-based applet to let you add sites while you're using someone else's machine. You have to log on at HotLinks and input URLs by hand.

There are other disappointments: You can't move links by drag-and-drop, and you can't export bookmarks back to your browser. You can e-mail your links to friends, but you won't be able to keep an address book. HotLinks will store your bookmarks, but right now, it's pretty much a one-trick pony.

HotLinks. Price: Free. HotLinks Network Inc., Mountain View, CA;650-691-6999; www.hotlinks

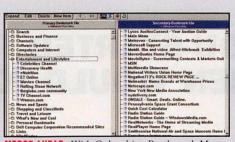
### Bookmark Utilities

f you use both Microsoft Internet Explorer and Netscape Navigator, you may find it difficult to keep your bookmarks in sync or pass some bookmarks from one browser to the other. since each browser

stores URLs in an entirely different way. Fortunately, a pair of free utilities (available at ZDNet Downloads and other popular download sites) let your bookmarks travel.

Columbine Bookmark Merge (CBM) is a handy piece of software (839K compressed) that merges bookmarks not only from Internet Explorer and Navigator, but also from Opera and NCSA Mosaic. It's a snap to use, too. On screen, you'll see two windows: one for your primary bookmark file, the other for your secondary file. Load one browser's favorites into the primary window: load another set into the secondary. You can then merge the secondary file into the primary file or just merge selected folders.

CBM compares links by name, URL, or both-you choose. If it finds a match, it looks to replacement rules which, again, you set. CBM will overwrite the primary file's book-



MERGE AHEAD: With Columbine Bookmark Merge, you can merge all bookmarks or selected folders.

mark if the secondary file's is newer or was used more recently.

If you use three, or even four, browsers, you simply repeat the process, loading each set of bookmarks into the

secondary window and setting the merge criteria. In the end, you'll have all the links you need in one file, which can be saved in the bookmark format of your choice.

You might also want to check out PC Magazine's own SyncURLs (375K compressed). It synchronizes Internet Explorer and Navigator bookmarks, making it easy to keep an identical set within each browser. When you launch SyncURLs, it looks for all the bookmarks on your system—no matter the browser-and loads them into a special library file you can view and manipulate within the program. A drag-and-drop feature eases the chore of organizing your links into folders (you can add new folders, too). When everything looks good, you can export the library to either browser-or to bothvia a single click. And you've have just what you need: one melting pot of bookmarks. -Alan Cohen

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#### Windows 2000 is Web-to-the-core.

You've got major-league stuff here. The new Microsoft Windows 2000 operating system is at the foundation of Windows DNA. This new OS now has a complete application server to develop and run serious enterprise-level Web apps. Its built-in middleware includes component services (COM+), Transaction Services (MTS), Message Queue Services (MSMQ), Internet Information Services (IIS), and an integrated XML parser. All members of the Windows DNA team work well together, including SQL Server™7.0, SNA Server 4.0, Site Server Commerce Edition 3.0, and Visual Studio.

#### Develop the apps you need for the Business Internet right now.

This is a five-alarm fire. They want Web apps. Everything from supply chain integration to sales tracking. And they want them yesterday. Good thing you're ready. With Windows® DNA, your experience with Microsoft® Windows and the Visual Studio® 6.0 development system has prepared you to develop those big, killer, Web apps faster than with any other platform. Using the skills you already have, you're well on your way to meeting the demands of the Business Internet right now.

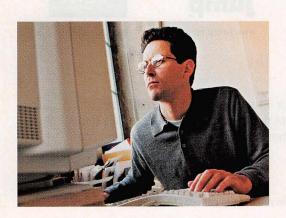


### **INTRODUCING WINDOWS DNA**

The Web development platform you already know.

#### XML and the new era of Web development.

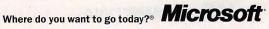
The launch sequence has begun. Your mission: 1) To take applications where they've never been before. 2) To lead the Internet beyond just HTML browsing, to programming the Web via XML. 3) To integrate business processes using XML, through BizTalk, which lowers costs and speeds development. Houston, we have a program: the Windows DNA platform with XML.





### **MSDN** provides comprehensive Windows DNA guidance.

MSDN is the number one resource for developers. It provides intensive care with specs, testing, events, procedures, and even second opinions. For help with Windows DNA, the easy and fast way to build serious Web apps, visit MSDN.microsoft.com/windowsdna



### Windows DNA@Work

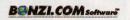




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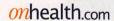
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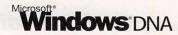


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Windows DNA is the leading platform for building the Business Internet. When these companies needed to build serious, reliable Web applications, Windows® DNA delivered big time. In fact, Microsoft® Windows DNA was chosen as the Web platform by over half of the top 50 shopping sites.\* To learn more, visit msdn.microsoft.com/windowsdna



Where do you want to go today? Microsoft



### Put Business Cards to Work

The Corex CardScan Executive converts stacks of business cards into information you can really use.

By Bruce and Marge Brown

combination of a specialized scanner and software, the Corex CardScan Executive Version 5 (\$250 street) is designed to do one thing: transform business cards into useful electronic records. The CardScan includes hardware and software enhancements that make it faster, easier to use, and more accurate than previous versions.

The CardScan 500 scanner now supports USB as well as pass-through and direct parallelport connections, and it has a convenient tray for catching scanned cards. The companion software, CardScan 5.0, can now better recognize international business cards and synchronizes contacts with more PIMs, PDAs, and cell phones.

Setup takes less than 5 minutes. The 400-dpi resolution grayscale CardScan is too bulky for mobile applications, at 2.4 by 6.9 by 5.8 inches (HWD), but it is easy to move between PCs. A power adapter, parallel cable, and USB cable are included.

You can initiate OCR processing for batches or single cards. The CardScan processed our test batch of 30 cards, including international samples, in 8 minutes 54 seconds, with minimal errors. For 100 percent accuracy, cleanup of the data can take considerably longer.

You can find and eliminate duplicate cards, search for one or more contacts with a text string, password-protect personal files, create lists, select views, and print contact information in various formats.

With MAPI-compliant email, the CardScan launches your e-mail client when you highlight an e-mail address and click on the mail icon. You can use the CardScan to e-mail complete CardScan records,

to address faxes in WinFAX Pro and FaxWorks Pro, and to direct-dial a phone number or access a Web site. The CardScan is compatible with many PIMs. including Symantec's ACT!, Microsoft Outlook, Lotus Organizer, and Franklin Planner.

Three applications are bundled with the CardScan. Corex's Area Code Fix (first year free, then \$20 per year) reads contact records and suggests area code changes. Paragon Software's FoneSync transfers CardScan records to a digital mobile phone with a connectivity kit (\$45 street). And On the Go



Software's Quicken Expens-Able 98 is for expense tracking.

The CardScan Executive Version 5 is a simple, surefire productivity tool.

**Corex CardScan Executive Version** 5. Street price: \$250 (CardScan 5.0 standalone, \$70 street). Requires: 16MB RAM; 30MB hard

ORGANIZE: You can assign multiple categories to one contact or a batch of contacts all at once with the Corex

disk space; CD-ROM drive; Microsoft Windows 95, 98, or NT 4.0 or later. Corex Technologies Corp., Cambridge, MA; 800-942-6739; www.cardscan.com.

CardScan Executive Version 5.

### Print with a LED Foot

Printers from IBM and Oki Data make color printing just as fast as printing in black and white.

By Alfred Poor

ery few color printers rely on light emitting diodes (LEDs) to create the printed image. Two such printers, with 8-page-per-minute (ppm) speed ratings, are nearly identical—IBM Infoprint Color 8 (\$2,700 street) and the Oki Data Okicolor 8 (\$2,500 street).

LED printers have four separate drums, each with an array of LEDs set at 600-dpi spacing. This single-pass design means

that they can print color pages as fast as they can print black and white.

On our tests both printers printed a black-andwhite 12-page document in the same time it took to print a 12-page document that included color items. In general, the speed for the whole document was 6.7 ppm—quite fast for color printing.

Setup is more involved for these printers than it is for others.

You must run alignment and color calibration procedures to line up the output from the four LED matrices and to get the color balance right. The Oki unit had software utilities for both tasks, but with the IBM printer you have to use the front panel controls to make the adjustments. Achieving a good color balance was a bit tedious; it took seven passes before we were satisfied.

Print quality was good but not

perfect. Both printers use Heidelberg color management and screening technology, which produces well-balanced and vivid colors without oversaturation. Alignment was good, though there was some slight but noticeable horizontal banding on color gradations.

The base models have only a parallel port. An optional 10/ 100Base-T interface card adds network support with remote management support, which adds about \$420 (list) to the Oki and \$299 (list) to the IBM units. Additional paper trays are also available.

> They may not be as fast as most color lasers on black-and-white output, but the IBM Infoprint Color 8 and the Oki Data Okicolor 8 LED printers have a speed advantage on color.

**IBM Infoprint Color 8. Street** price: \$2,700. IBM Printing Systems, Boulder, CO; 800-358-6661; www.printers.ibm.com.

Oki Data Okicolor 8. Street price: \$2,500. Oki Data Americas, Mount Laurel, NJ; 800-654-3282; www.okidata.com.



color output in one pass.

PHOTOGRAPHY BY THOM O'CONNOR

### CorelDraw Means Business

Corel has designs on the business market with a new version of its graphics suite.

By Sally Wiener Grotta

ased on the powerful CorelDraw 9 code, CorelDraw 9 Office Edition is downsized and repackaged for the business market. With four CDs filled with templates, clip art, and photos, CorelDraw 9 Office Edition (\$249 list, \$169 upgrade) satisfies the need for professionalquality graphics that are comparatively easy to produce.

On start-up, the tabbed Welcome screen displays 500 business-oriented templates such as newsletters, invoices, fax cover sheets, charts, forms, business cards, Web pages, and brochures. You choose your output (desktop printing, professional printing, or the Web) to set up the appropriate resolution and size parameters. Click on the placeholders to type text or add a graphic or drag and drop text

and graphics to and from Corel WordPerfect Office or Microsoft Office.

The power behind Corel-Draw 9 Office is quite accessible. For instance, the Object Properties dockable window is a superb tool for intuitive, creative control over color fills, lines, type, paragraph wrap, URL hot links, and fonts.

CorelDraw 9 Office has inplace basic image-editing tools such as color balance, crop, resample, brightness/contrast, and hue/saturation. For more advanced tools, double-click on any photo and launch the integrated bitmap editor (based on Corel PhotoPaint). You can use Corel-Draw to acquire images directly from more then 120 digital cameras; the program also supports the Twain interface for use with other cameras and scanners.

The program has only a hand-



FAMILIAR FACE: A direct interface familiar to CorelDraw users is easy to use, with dockable windows for control over a project and its elements.

ful of wizards, but they are important ones. The Publish to PDF and Publish to the Web wizards are most notable. Professional output options include Encapsulated PostScript, preflight warnings (and corrections) for print and for the Web, and a Prepare for Service Bureau wizard.

The program includes Corel Presentations 9 and Canto Cumulus Desktop LE 4.0 (media asset management). CorelDraw

With multitabbed dialogs

9 Office compares favorably with competitors. Microsoft PhotoDraw is better for creating Web page elements and is less complex, but CorelDraw 9 Office Edition's feature set is deeper and its templates more varied. CorelDraw 9 Office Edition. List price: \$249 (\$169 upgrade). Requires: 32MB RAM; 150MB hard disk space; Microsoft Windows 95, 98, or NT 4.0. Corel Corp.; Ottawa; 800-772-6735; www.corel.com.

### Chart a New Course

An add-in for Microsoft Office, Amigo 2000 creates charts and graphs that get noticed.

By Barry Simon

hree D Graphics' Amigo 2000 (\$99 list) is an add-in to Microsoft Excel and PowerPoint (both the Microsoft Office 2000 and Office 97 versions). The program adds buttons to the main button bars of Excel and Power Point. although there are plans to add support for Microsoft Word and to make Amigo an OLE server that can be invoked from any OLE client.

Unlike the dull output of Microsoft Graph that comes with MS Office, Amigo's creations are visually stunning and can invoke a number of chart types that aren't available in Graph. One kind is pictographs, where bars are replaced by multiple copies of a piece of clip art. There are

also the three-dimensional bar and ribbon graphs that made Three D Graphics famous.

Besides new chart types, Amigo can customize graphics elements in a variety of ways. Any object can be filled with a

texture such as wood or marble. Objects can be made partially transparent produce dazeffects. zling Chart elements can be exquisitely rendered using OpenGL produced in software in case you don't have OpenGL hardware.

that are intelligently laid out, Amigo's interface makes the program a pleasure to use. There is a chart gallery with lots of examples, and the program will analyze your data and make suggestions about which kind of chart to use.

Potential users of Amigo need to be aware of two issues. First, the program—especially the rendering engine—stretches

hardware

CHART ART: Amigo's effects include pictographs, textured fills, and 3-D graphs. capabilities. Performance on our Pentium/150 test system was often slow; operation on our 500-MHz test system was fine.

Second, the program has more than the usual number of firstversion glitches. There were numerous annoyances, such as the failure of Office Clip Art to link correctly to the pictograph dialog on some systems and the appearance of menus in strange fonts on others. The program's Live Update should allow fixes to these problems to be distributed easily.

Amigo 2000's spectacular output makes the hassles worth putting up with. Amigo 2000 is a graphics engine that's on a par with the high standard of Microsoft Office.

Amigo 2000. List price: \$99. Requires: 40MB hard disk space; Microsoft Windows 95, 98, or NT 4.0; Microsoft Office 97 or 2000. Three D Graphics, Los Angeles; 800-913-0008; www .threedgraphics.com.





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### One-Way Wireless Web

The WebLink e-Pager is a smart paging package designed for everyday users.

By Bruce and Marge Brown

aging is hardly a new technology, but paging services are using the Internet to devise new uses for pagers—such as e-mail, faxing, and news and information services. The latest to enter the fray is WebLink Wireless (formerly PageMart Wireless), which packages the e-Pager as a PC peripheral, with optional numeric paging.

With the WebLink Wireless paging service and a compatible Glenayre Wireless, Motorola, or Philips pager, you can receive email via an e-Pager mailbox, notification of online faxes, updates of Internet content, and My Yahoo! alerts of e-mail, auction activity, and appointments. e-Pager is a well-organized wireless service appropriate for

first-time pager users, but not for corporate road warriors who don't want additional pager, e-mail, and fax addresses.

Local coverage on the one-way paging network costs \$9.95 per month for

the first 125 messages (up to 100 characters each) and 8 cents for each additional message. Use of the two-way paging network to obtain automatic roaming costs \$19.95 per month for 125 messages and 5 cents for each additional message. The fee structure is identical with or without a unique e-Pager phone number for regular one-way paging. With regular paging, a voice mail feature (15 30-second messages held for 24 hours) is available for an additional \$5 per month.

WebLink lets you choose



from four pagers ranging from \$60 to \$170 (street); the company's site provides details on each. We tested e-Pager with a four-line Motorola pager.

After you obtain a supported pager, you activate the service from the WebLink Wireless Web site. A test message is sent to your pager within 24 hours to verify that the service is working.

In addition to receiving an e-Pager Internet e-mail address, subscribers are encouraged to accept free services including a My Yahoo! e-mail account and a

#### INFO ANYWHERE:

The e-Pager delivers news, sports scores, and much more to the palm of your hand.

CallWave online fax number. (At the time of testing, the e-Pager e-mail and fax alerts with these partners were still under devel-

opment.) e-Pager information services, including the MSN Mobile group, offer recipes, fitness tips, book coupons, restaurant promotions, decorating tips, entertainment newsletters, and other interesting content.

The WebLink e-Pager is a good entry-level package for wireless computing. Just watch those monthly charges.

WebLink e-Pager. Street price: Pager (\$60 to \$170), plus monthly service fee (\$9.95 to \$19.95). WebLink Wireless; Dallas; 800-324-7243; www.e-pager.com.

### The Force Is with Your PC

The Logitech WingMan Force Feedback Mouse brings gaming technology to business users.

By Sally Wiener Grotta

hy should gamers have all the fun? The Logitech Wing-Man Force Feedback Mouse (\$100 street) gives users a tactile, physical response to a variety of popular games. It can also be used as an aid in navigating around Windows and the Internet. Although the WingMan still has a few rough edges, its forcefeedback technology clearly represents the next stage of pointingdevice evolution.

The WingMan is physically attached to a 7- by 12-inch mousepad. The mousepad has two lights that indicate when the mouse is powered on and whether the game you're playing supports force-feedback effects. Since force feedback needs more electricity to power its magnets than the USB port

can provide, the mousepad comes with an AC adapter.

The three-button, high-resolution mouse has a throw radius of about 1.5 square inches and can rotate about 60 degrees. Its limited range of motion can be disconcerting at first, but we quickly became accustomed to it. All three buttons are programmable; in default mode, the middle button functions like a scroll wheel when browsing the Web.

Setup is as easy as installing the software and plugging the device into any USB port; it peacefully coexists with your other pointing devices. If the effects are too weak or strong for your taste, or if you want to switch among its four modes (joystick, absolute, relative, or absolute with acceleration), it's relatively easy to create a custom profile that loads in every

time vou run a particular game.

The WingMan ships with GameSpy, a utility that surveys your hard disk to tell you which installed games are force-feedback compliant. It also has an automatic link to Logitech's Web site for downloading the latest game drivers.

As we said, the WingMan isn't just for gamers. After 30 seconds of navigating through any application in Windows or using a Web browser, you'll never go back to an ordinary mouse again. The WingMan provides tactile feedback whenever you use a pull-down menu, roll over an icon, or land on a hot link. Alas, though the Windows shell and menu structure provide feedback. currently there are

support force feedback. The WingMan Force

no applications that

Feedback Mouse adds a whole new dimension to computing. But before it is widely adopted by mainstream users and not just gamers, it will need more support from software makers. Logitech WingMan Force Feedback Mouse. Street price: \$100. Requires: 16MB RAM, Microsoft Windows 98, USB port. Logitech, Fremont, CA; 800-231-7717; www.logitech.com.



PHOTOGRAPHY BY THOM O'CONNOR

# 'I wanted the best protection available and APC delivered."

- Fred Lugano, weatherization.com, Vermont

### 8 million computer users can't be wrong about APC power protection

Personal computer users across the country recognize APC as a leader in power protection. Now, home users are finding multiple uses for APC products. Some use their APC to run a television or small refrigerator during a disaster. Others will use their APC Uninterruptible Power Supply (UPS) as a "power bridge" to give them enough time to get their power generators started. Still others will use APC to protect sophisticated audio and visual equipment from damaging electrical surges.

Business users enjoy the dependability of APC, the \$25,000 equipment protection guarantee that comes with all APC UPSs, and the Lifetime Guarantee<sup>†</sup> that comes with all APC surge protection products.

Visit your reseller or the listed retailers and try one today!



**APC** provides legendary surge protection for all your equipment needs.









'APC's latest plugs into a USB port, making it completely painless to protect your PC from power snafus and electrical spikes."

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# **FIRST LOOKS**

#### Linux for the Rest of Us?

NetMAX makes it easy for network managers to set up and administer Linux-based thin servers.

By Winn L. Rosch

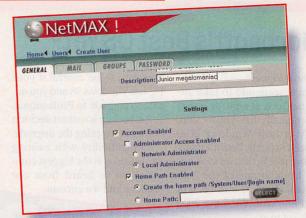
he real miracle of Linux is that it has won wide acceptance—despite setup and administration that's more incomprehensible than a cell phone rate plan. Net-MAX, from Cybernet Systems, neatly overcomes these handicaps to turn almost any modern PC into a thin server—a Linuxbased LAN or Web server without console, keyboard, monitor—or migraines. Its installer wallpapers over most setup headaches and delivers a Webbased administration interface that makes the command line as obsolete as a floppy disk

NetMAX comprises three separately available packages: NetMAX WebServer, Net-MAX FileServer, and Net-MAX FireWall. Each is built around Red Hat Linux 5.2 or FreeBSD and retails for \$99

(direct). An all-inclusive Net-MAX Professional package is available for \$499 (direct). The extra \$102 for the full version buys complete integration as well as additional news server, LDAP, and dial-up capabilities. We tested NetMAX Professional for Linux.

NetMAX isn't quite Linux for the rest of us. The software still requires a working knowledge of network (and Web) administration. NetMAX is at its best when used as a bridge to Linux for NetWare and Microsoft Windows NT.

Each package includes a full Linux distribution. WebServer adds Apache Web server and Sendmail e-mail server as well as an FTP server. FileServer includes Samba and Netatalk fileand print-sharing software in addition to network backup. FireWall includes both firewall and routing software.



LIKABLE LINUX: NetMAX replaces the command line with a friendly, browser-based interface.

Even if you have no Linux experience, you can have Net-MAX running in the claimed 15 minutes. Boot the floppy and CD disks in their respective drives and you can run the entire show-setup and administration—from a remote console.

Once NetMAX is running. you control it through your ordinary Web browser. All packages share the same interactive graphic interface. At this point, the documentation proves too

thin for those without experience managing a network.

Note that NetMAX is not Linux abridged. Everything, including the command line, is there if you want it. Rather, the software is an enhancement that adds ease and convenience

NetMAX Professional for Linux. Direct price: \$499. Requires: 32MB RAM, 1GB hard disk. CD-ROM, floppy disk drive, network adapter. Cybernet Systems Corp., Ann Arbor, MI; 800-292-3763; www.netmax.com.

#### Hard Disk Duplicator

The Greystone DataFast Hand Held D-101 is an advanced, portable, hard disk duplication tool.

By Craig Ellison

orporate help-desk staffs have to deal with several common hard disk-related problems-name-

ly, how to copy one hard disk to another quickly to provide a standard client installation and how to upgrade clients' small hard disks to larger ones and keep the contents intact. The Greystone DataFast Hand Held D-101 (\$895 list) disk duplicator provides a solution to both of these problems.

To use the D-101, you install vour own hard disk into the D-101's fan-cooled chassis. You

DISK DOUBLER: Toss a hard disk into the Grevstone DataFast Hand Held D-101 and you can copy contents back and forth.

then connect the supplied IDE cable to a target disk and copy the contents to your disk. If you aren't comfortable opening up



vour computer to get access to the hard disk or don't have physical access to it, you can still copy the contents via a parallel-port connection using the supplied cable and software. Of course, using the parallel port significantly extends the copying time.

The D-101 supports bidirectional copying, so you can either retrieve information from the external disk or push a software load to the external disk. The D-101's Smart Copy operating system provides disk geometry independence, so you can copy from a small hard disk to a large one.

We tested the D-101 by copying a 2.1GB hard disk containing 766MB of data to both a 4GB hard disk and a 14GB hard disk. We then installed those disks into systems, and they booted as expected.

The copying process for the 766MB took approximately 2 minutes 24 seconds when using 7,200-rpm Quantum Fireball drives. Greystone claims datatransfer speeds that can exceed 400MB per minute; the datatransfer rate is tied directly to the speeds of the hard disks.

Greystone offers a number of software options to expand the functionality of the D-101, including NTFS Smart (\$195 list), a utility for copying NTFS partitions, Wipeout Smart (\$175 list), a utility for erasing a disk to Department of Defense (DoD 5220.22-M) specifications, and a hard disk diagnostic program (\$195 list). Also in the works is Partition Smart (\$195 direct), which lets you control drive partitions on the source disk when copying.

Greystone DataFast Hand Held D-101. List price: \$895. Grevstone Peripherals Inc. (a Subsidiary of PubliCard Inc.), Los Gatos, CA; 408-871-4000; www .grystone.com.

# SECOND LOOKS

#### LIVING WITH THE PRODUCTS WE REVIEW

#### Microsoft's Best OS Yet?

By Steve Rigney

t may seem odd to take another look at a product that technically has yet to ship, but Microsoft Windows 2000 has been in public beta for many months now. In fact, we took our First Look at one of the beta versions (Beta 3) way back in July 1999. With Windows 2000

finally set to arrive on store shelves and corporate PCs near you, we thought this would be a good time to ask readers how they felt about the product and whether they planned to upgrade to it in the coming months.

First, let's look at some Windows 2000

basics. As we explained in an earlier review ("Win2000: A Worthy Beta," First Looks, July 1999), the Windows 2000 family consists of the Professional, Server, Advanced Server, and Datacenter Server versions. Professional is a direct replacement for Windows NT 4.0 Workstation and is designed for standalone or network client PCs. It has most of the basic features but has a limited Web server and can handle only up to two CPUs.

Server has all of the features of Professional in addition to working with 4 CPUs and adding an Active Directory controller and a full version of Microsoft IIS 5.0. Advanced Server can handle up to 8 CPUs, address 64GB of RAM, and provide load balancing and clustering. The only addition to the Datacenter Server version is the ability to handle 32 CPUs.

In a nutshell, end users and home users will want to stick with Professional. We always recommend using the version that originally came on your PC, however, so be careful if your PC has Windows 98 and you decide to upgrade to Professional. A full backup is a smart decision before attempting the upgrade.

Compatibility with existing applications is the biggest complaint we've heard from our readers, and we encoun-

Windows 2000 Configure Your Server From the menu at the left, choose the services that you want to run on this server. You can set up any or all of the services, depending on how you want to customize your network. To set up or find out more about a service, click the service name on the menu. Active Directory File Server Find out Wnats New in Windows 2000 Server. To reopen this window at any time, click Start, point to Programs, point to Administrative Tools, and then click Configure Your Print Server Server Return to Server Choices page Advanced • F Show this screen at startup

> COMING TO A PC NEAR YOU: After many delays, the final version of Windows 2000 is scheduled to arrive on store shelves shortly.

tered similar problems as well. Sure, Windows 2000 now supports Plug and Play as well as USB devices, but the software doesn't work with certain things, such as games and multimedia applications. For example, we were unable to make our Toshiba DVD player work using an nVidia TNT adapter. The DVD player in Windows 2000 doesn't include any decoders, and we were unable to find any software decoders for Windows 2000 available on third-party vendors' Web sites.

We were not the only ones to experience compatibility issues. Readers also found some problems. For example, one reader tried several games with the new OS and found that they either did not run at all or performed more slowly than under Windows 9x. The same reader experienced additional problems; the OS did not recognize his DVD hardware decoder or his Epson USB printer.

In all fairness, Microsoft has tested thousands of devices for compatibility, but most of the focus seems to be on business applications and hardware.

After all, Windows 2000 is designed as a business desktop; Windows 9x is the platform of choice for multimedia and entertainment. Even Microsoft ad-

mits that you'll have better luck with games and entertainment devices using Windows 98. But business needs such as support for ATM and wireless networking will be better under Windows 2000. Active Directory (AD),

the biggest enhancement to the entire Windows 2000 family, is a network administrator's dream. In a nutshell, AD is designed to work as a global directory and central repository that stores all the information about users, applications, PCs, and other devices. In general, AD is very powerful, but it is not for the

faint of heart. The most important task is that of designing your directory—including what will be the root or primary controller-and how the servers will communicate together. This is more complicated than it sounds because it relates to location and connection speeds.

You have to decide whether to buy into AD completely or live in what Microsoft calls Mixed mode. In Mixed mode you don't get all of the benefits of a global directory such as the ability to distribute software, assign domain names to IP addresses on the fly, and so on. Unfortunately, Native mode, which provides all of these features, means that every server you own must be Windows 2000 and the clients must be compatible. This is just not a real-world scenario.

In an upcoming issue, PC Magazine will have a comprehensive feature story based upon our testing of the final version of Microsoft Windows 2000. In the meantime, based on our long-term experience with the prerelease versions, we can say that Windows 2000 is a promising OS that offers something for just about everyone.

#### www.secondlooks.com

Tell us what you think...How do you like the new products you're using? Second Looks is your forum for feedback. Join us online to tell us about your experiences. We discuss a different new product each week and summarize your comments here. Following are some of your comments from our discussion of Microsoft Windows 2000.

After using beta 3 for the last couple of months (I haven't had the chance to test out RC2), I can say without question it's Microsoft's best OS to date. But a few bugs still need to be ironed out—such as Direct X. I'm a big computer gamer (so this is a must), and I threw several games at it, including Midtown Madness, Shogo, and Mechwarrior 3. Shogo crashed after the first level. Midtown Madness worked but ran slower. Mechwarrior 3 wouldn't even install. But most apps, such as WordPerfect, installed and ran perfectly.

I've had Windows 2000 Advanced Server installed for a couple of weeks and have very good things to say about it. My only complaint is that my TV tuner software will not function under it (ATI All-in-Wonder). Aside from that, I find the new look and feel more than refreshing. And I have not experienced any crashes to date. I also run Windows NT 4.0 Workstation and Server (SP5) and find it equally reliable for my purposes.

-Michael Johnson

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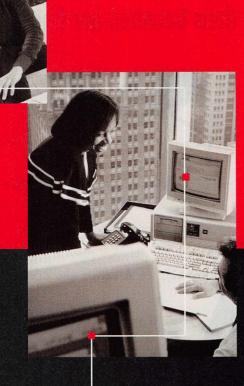
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business. Reserve your company name today!





# USB is Wonderful/Terrible

Amazingly enough, the debate rages on about USB. USB is a fait accompli in all of the computers produced in the last three years and in the three major operating systems, Microsoft Windows 98, Windows 2000, and the Mac OS. There's virtually no peripheral that isn't available in a USB version. Intel and

Microsoft are both pushing hard to eliminate the legacy parallel and serial ports.

And yet every time I write about USB, I get a ton of anti-USB mail. These people are not in love with serial and parallel ports. They don't think that Plug and Play was the answer to their prayers. But they do have issues with USB.

The technology press appears to be monumentally bored with USB. I see very little testing for USB compatibility, conflicts, or performance, yet all are issues. Coverage of the technical side of USB is almost nonexistent. Some peripherals—especially cameras, scanners, and networking devices—can severely tax the 12Mb bandwidth of today's USB. When the USB Implementers Forum tried to build excitement with the announcement of USB 2.0's speed (480 Mbps, or 40 times faster than today's USB), it was roundly ignored. USB 2.0 products start shipping later this year.

In fact, some people are angry with Intel (the chief driver of the technology) for pushing the speed up so high. They see this as a direct attack on the High Performance Serial Bus, or IEEE 1394. HPSB currently runs at 400 Mbps and will soon go to 800 Mbps. Its dominant application is connecting digital video cameras, but vendors such as Granite are also producing large-capacity HPSB disk drives, perfect for the demands of multimedia production. Some insiders say that Intel's beef against HPSB is that it is a peer-to-peer connection, which puts the PC on equal footing with consumer electronics devices. USB connections are master/slave ones, with the PC controlling the peripherals. And the more the PC does, the more you need a new, faster processor.

I continue to compliment Compaq and Gateway, among others, for their leadership in providing HPSB ports on a number of their high-end and consumer machines. Yet Gateway also recently introduced the Astro, a legacy-free machine that depends entirely on USB for expansion and peripherals.

Is Ethernet another Intel target? USB 2.0's speed could encompass Ethernet's basic 10Mb rate, but to force networking onto today's USB is almost a criminal act. Sure, you can get Ethernet-to-USB converters, but consider home users who want to hook Astros up to cable modems or DSL. They might want to add digital cameras for video Web chats. Suddenly, all of the cameras' traffic appears twice on the USB buses—once as video frames, once as outgoing packets. Performance, predictably, is awful.

USB 2.0 will have the bandwidth to alleviate the crunch, but a USB-only machine today is a mistake. Bandwidth, however, is not the only consideration. USB is a master/slave bus, so peer networking requires a degree of hardware trickery and driver tomfoolery that hurts performance. The answer? Throw more CPU speed at it, of course.

USB compatibility remains wildly inconsistent. My three-year-old Gateway 9100 laptop has better USB compatibility than a new Toshiba Portégé 7020. Installing Windows 2000 on the Portégé allowed some devices to run (a 3Com digital camera) and broke others (a RioPort 500). I'm still working on patches and driver solutions, and every new USB device is an adventure. Despite the plug-and-play claims for USB, you still have to read the directions carefully. Some devices require that you load the software first. Others trigger a search for drivers when you plug them in. Some get upset when you unplug a device without first stopping; others don't care.

The enormous and largely corporate Windows NT crowd is hopping mad about the lack of a service pack that gives full USB support. Some USB devices are supported by their manufacturers, but Windows NT users who want to use USB peripherals will have to upgrade to Windows 2000.

You can buy a machine with a USB keyboard today-if you're crazy enough. Ask first if the machine has a real USB BIOS that supports the keyboard on cold boot before the operating system loads. If it doesn't and you ever have to fix a major system crash, you may be out of luck. Such BIOSs are just barely trickling into the market.

The more you think about USB, the more you see why the sound and fury continues. R

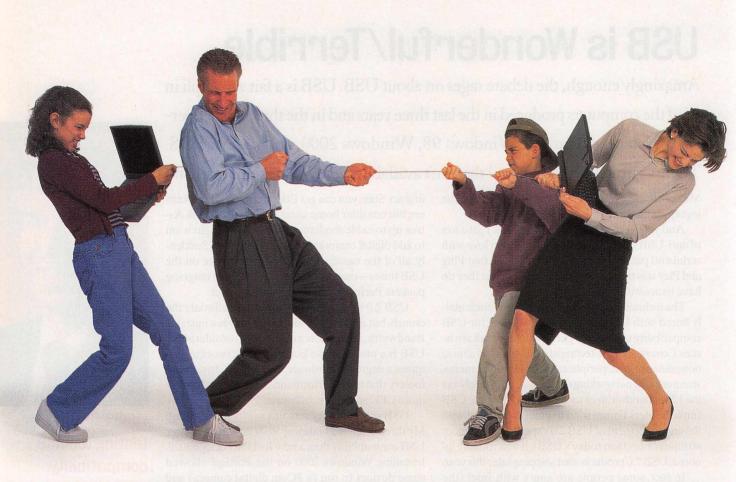


I see very little testing for USB compatibility, conflicts, or performance, yet all are issues.

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#### John C. Dvorak

# Not a Monopoly, Marketing

Microsoft is not a monopoly; it just pretends to be one. In fact, what's gotten the company into trouble is its scheme to cover up the fact that the PC is a proprietary platform designed and owned by Microsoft. Windows is part of a proprietary platform and competes with other pure platforms, including

Mac and Sun's Solaris. Why else would Scott Mc-Nealy be so obsessed with Microsoft?

Microsoft's model for marketing a proprietary PC (which I'll call the Microsoft Windows PC) is unusual, because Microsoft doesn't manufacture the hardware. The concept is similar to the fab-less semiconductor company. Microsoft does control the specifications of the computers and essentially outsources the manufacturing of the computers on a nofee basis. This is a remarkably generous approach. The company expects that this generosity be rewarded with some modest amount of loyalty. Why should Microsoft put all this effort into the design (for example, PC-100 specifications) if a company is going to put Linux on the PC? Use a new legacy-free box or something else for that.

It's for marketing purposes that this proprietary Microsoft Windows PC platform is not portrayed as such. Microsoft is playing into the sentimental notion that the PC itself is an open platform that offers more choices. Third-party development and faux competition with Microsoft was encouraged to deceive the buying public.

With the PC, Microsoft took control of the platform immediately and is largely responsible for its development. The DOJ testimony that Microsoft was pushing Intel around reflects this fact. IBM got early credit for the platform, but when IBM rolled out its PS/2 machines and the Micro Channel, IBM found Microsoft owned the platform. Once Windows fully arrived, Microsoft took brutal control.

This way of looking at Microsoft and Windows explains everything, including Microsoft's recent whining-especially about innovation. To many of us Microsoft seems to have made no innovations that weren't borrowed or bought. But if you throw in the hardware part of the equation, you'll find things such as the USB port and other true innovations. Microsoft's annual WinHEC conference addresses the hardware aspect of the Windows platform. Why would such a conference even exist if Microsoft weren't in full control of hardware specifications?

Seeing the Windows PC as a proprietary platform also explains why Microsoft would want Netscape out of the picture. I'm certain that nobody at Netscape visualized the situation accurately. They obviously believed the Microsoft marketing nonsense and made bad assumptions. By siding with Sun and making noise about having a Net OS running on the Microsoft Windows PC hardware, Netscape violated the proprietary nature of the Microsoft Windows PC.

Microsoft owns the specifications and essentially licenses them on a no-fee basis, so the company feels no obligation to let other companies do whatever they want on the system, which would be like going into a fancy restaurant and setting up your own hotdog stand. Once Microsoft decided to shut Netscape out, it had to go around and remind the gratis licensees (Dell, Compaq, and others) of their obligations as manufacturers of the Microsoft machine! These companies make money off Microsoft's hard work—at the behest of Microsoft. Seen this way, the Microsoft "threats" to pull the OS from any company bundling Netscape were reasonable.

The most laughable irony is that Microsoft has marketed around the fact that the Microsoft Windows PC is a proprietary computer. The marketing machine should have said: "Hey, this whole thing is nonsense, since we own a closed proprietary system. It was only for the purposes of marketing that we made it appear to be open, so we could sucker people into buying our software and fool them into believing they actually had a real choice. Marketing, marketing, marketing." The fact that other operating systems can run on the Microsoft Windows PC is actually amazing. But the fact that few people use these other systems is no surprise.

Seen in this light, Microsoft is no more a monopoly than any other company selling a single product in a complex marketplace. Unfortunately, the foundation of Microsoft's success—an overly complex marketing scheme—is what led to this recent humiliation.



Microsoft is playing into the sentimental notion that the PC is an open platform that offers more choices.

More on the Web: Read John C. Dvorak's news, views, and snide asides every Monday at PC Magazine Online. And don't miss Dvorak's "Silicon Spin" every day on ZDTV. You can also view past shows at www .zdtv.com/siliconspin.

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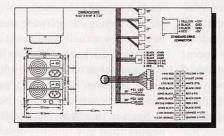


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John C. Dvorak's

# INSIDE TRACK

The last Comdex of the millennium was awash in rumors. The most interesting one was about what wasn't at the show—namely, a working gigahertz Intel processor running Windows 2000. The rumor mill has it that Intel tweaked the chip, believed to be an Itanium or Willamette, to get the thing stable at over 1 gigahertz, but then the machine couldn't boot Windows. Apparently there wasn't time to correct the problem, but the show went on.

In the meantime, Intel had other problems stemming from the dubious decision to announce the 733-MHz Pentium III in the fourth quarter, which is usually when the company coasts. This chip was obviously announced out of pride to top the AMD chips. The announcement did what all announcements have the potential to

do: throw a wet blanket on sales of slower parts. What makes matters worse is the immediate shortage of the higher-speed chip, making the announcement something of a pre-announcement, which is a faux pas in the computer business. People in the company are grumbling that this is something Andy Grove would not have done. On the other hand, it's well known that Andy Grove wouldn't have allowed AMD to leapfrog Intel in speed twice in the same decade. Times change.

Besides AMD showing off fast chips on the high end, Intel has to now worry about VIA Technologies showing off cheaper chips on the low end. VIA was at the show with its Cyrix/IDT chips and a vendetta against Intel, which has done whatever it can to keep the VIA support chips off the market. Intel has been pushing its somewhat disliked Rambus strategy, and VIA has short-circuited the Intel roadmap with support chips that engineer the Intel processors for use with SDRAM. Patents are involved. VIA says it is just trying to make a living giving customers what they want.

The hard disk boys were also at Comdex, showing off all sorts of high-capacity drives, including a one-platter 20GB drive running at 10,000 rpm. Data should be flying off that thing. Expect 2000 to be the year that the data rate goes over 100 MBps. The high-speed SCSI is coming to market, and a super-fast IDE is in the works. I've even heard one designer talk about a 500-MBps IDE! If something like that shows up, look for a reemergence of virtual memory schemes that are actually useful. Surely some new applications will come from this.

The Comdex show itself had a number of serious flaws, not the least of which was the inability to handle the onslaught of people registering on opening day. I've never seen a line so long, and people were all over the place with bullhorns. All that was missing were the shackles on the attendees. Comdex moved the press room to someplace in the Hilton, and I never did find it. Seems to me that it

should have been someplace near the main halls. I was at Comdex from Sunday through Thursday and never once passed by or even found the press room. Once I had my badge I never made much of an effort to find it, I admit, but you'd think I'd have run into it anyway. I'm sure a lot of publicity opportunities were lost.

Some people found the show to be less exciting than in years past. I didn't think so, and I particularly liked the action at the Sands Convention Center. The Sands Hotel itself is gone and has been replaced by the jazzy Venetian. The Sands is where you could find all the theme booths. These are groupings of small firms from various countries. For example, Taiwan had a huge section; the Taiwan area was almost as large as a small trade show itself. So too

> with Hong Kong, Korea, France, and just about every country you can think of. I was amused by the poor showing that the British made in their UK segment, where most of the products seemed to be cheap OEM stuff from Taiwan.

> If there was a theme in these areas, it was cameras, cameras, and more cameras. I've never seen so many little cams hooked up to computers. I don't know that many people who have individual cameras hooked to their computers, but if this show is any indication, there is going to be a glut on the market of cute cams worldwide. Some were even motorized, so they could follow movement.

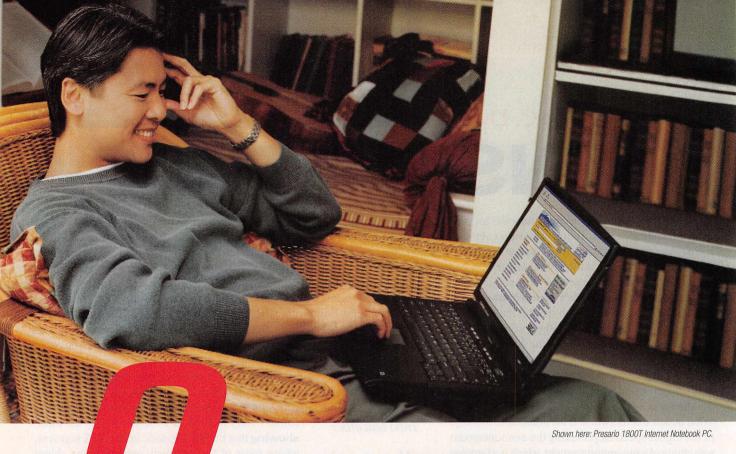
What was missing from this year's show seemed to be the marketing overkill I've seen in the past. For example, there were a lot fewer magicians doing their cornball if fascinating card tricks. I don't recall seeing one magician, although there must have been dozens someplace. And the staged shows were cut way back. I think the scene in Vegas itself

had an adverse effect on the show. The big South Hall, arguably the most important hall in the Convention Center, began to thin out by Tuesday afternoon. Did people come for only one day? What is more important than this show to this business? Going home, I guess.

The show was noticeably smaller in scope than last year. Also, the attendance set no records, and as of this writing, the numbers appear to be suppressed. Only vague "over 200,000 are expected to attend" figures have been released. I talked to hotel owners who said that normal corporate employee attendance was off by as much as 20 percent. Even rental cars were readily available. Comdex itself is partially to blame. The organization has been spreading itself thin by adding more and more International venues. I mean, there is even a Comdex in Vancouver! Although this show is far from dead, I think its growth is over as the operation becomes more regionalized. PC

company coasts.

Intel had other



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	14.1" TFT Active Matrix Display	14.1" TFT Active Matrix Display	14.1" TFT Active Matrix Display	14.1" TFT Active Matrix Display	N/S
	64 MB SyncDRAM	64 MB SyncDRAM	128 MB SyncDRAM	128 MB SyncDRAM	H
1	4.8 GB UltraDMA Hard Drive <sup>1</sup>	4.8 GB UltraDMA Hard Drive <sup>1</sup>	6.0 GB UltraDMA Hard Drive <sup>1</sup>	6.0 GB UltraDMA Hard Drive <sup>1</sup>	
	24X Max CD-ROM Drive <sup>2</sup>	4X DVD-ROM Drive <sup>4</sup>	4X DVD-ROM Drive <sup>4</sup>	4X DVD-ROM Drive <sup>4</sup>	
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#### Jim Seymour

# **Web Offices Getting Serious**

I want to go back for a minute to the idea of so-called Web apps, which we covered extensively in a cover story in the November 2 issue of PC Magazine and which I also wrote about in my column for that issue. Put plainly, this is just too important to let go of. I find that there is a great deal of confusion

about just what Web apps, or applications delivered by application service providers (ASPs), are. I find way too many software developers looking for ways to tweak their existing apps into Web apps: a classic example of getting it backwards. And I find that there is great interest in but little understanding of how the emerging group of "Web office" Web sites work.

The Web app idea is a simple and seductive one: Rather than buying or downloading software and then installing it on your PC, you log on to a Web site where you use an application that remains on that site's server. At your end, you see either a conventional browser interface or a custom screen. You enter information, get results, and can print or save at your end-but the real computing is accomplished on the server end of the connection.

You or your company pays a monthly, quarterly, or annual fee for the use of the software—or it may be free. Either way, you're always assured of having the current versions, without worrying about upgrading and version incompatibilities. And either way, you can use the software only while you're actually connected to the Net. Off-line means, well, off. Period.

There's a lot of talk in the industry right now about Microsoft's efforts to sell—oops, rent—Microsoft Office applications as Web apps. Its notion is that you'll run Windows Terminal, a relatively simple "presentation" interface, on your PC; the apps themselves will reside on the servers of the ASP shops that contract with Microsoft for the right to rent out Office apps.

Frankly, I don't give a hoot about using Microsoft Office via the Web app model. Going back and reworking existing applications to be served as Web apps is a stupid, compromised, self-defeating exercise. We don't want or need half-witted, reworked versions of programs we already have via the ASP model. We want new apps and new ways of working that don't just mimic the idea of working online but embrace and extend it (if I can steal for a moment Microsoft's now-legendary phrase).

That's why I'm so high on the idea of the new Web-app portals, or Web-app hubs, or Web officescall 'em what you will—that are starting to appear. They're the real carriers of the torch for the Web apps notion. And if you miss them, you'll miss one of the most important ideas in computing to appear since the PC itself.

Take a look at Desktop.com (www.desktop.com), one of our Technical Excellence Award finalists, or SmartOnline.com (www.smartonline.com). And you'll get the idea, fast.

Case 1: At Desktop.com, you'll find a set of applications you can use for ordinary, everyday productivity jobs-writing memos, keeping your calendar, and so on. These aren't Windows apps; Windows plays no role in running them. (That suggests another part of the power of this idea: true cross-platform tools.)

Instead of relying on the Windows desktop, Desktop.com gives you a great Webtop approach to your work. A very attractive desktop downloads to your display every time you log on (it reminds me somewhat of the BeOS desktop). As you use Desktop.com, you populate that virtual desktop with the applications you use from its Apps Library. You can "save" (upload) or "open" (download) files you're working on to the Desktop.com site from its File Manager.

As I write, Desktop.com is still in beta (though you can register and use it now); its array of desktop apps is limited—and the ones you'll find there today are hardly industrial-strength. That will change, and quickly, as Desktop.com rolls out more, new, and better applications now in development.

As with all present Web apps, if you're not connected to the Web, you can't work: Sitting in an airplane at 35,000 feet, your notebook is deadweight. Sure, that's a disadvantage. But consider the offsetting advantage: You can log on to your own Desktop.com desktop and your own personalized set of applications from any PC in the world that has a Net connection. (Conceivably, you could even log on from one of the new-generation Web-connected video game machines, such as the Sega Dreamcast or Sony PlayStation 2.) There's your desktop. Your apps. And your files.



Web hubs such as SmartOnline.com and Desktop.com show that some people really get the power of working online.

More on the Web: Join us online and make your voice heard. Talk back to Jim Seymour in our Opinions section.

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# 

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# Jim Seymour

Desktop.com is an audacious idea—and a welcome one. It may be too big a reach, but only time will tell. And if Desktop.com doesn't succeed but only establishes the model—or falls behind that vicious curve called Internet Time—you can bet that competitors will line up to take its place.

Case 2: Take a look at SmartOnline.com. An even bigger idea than Desktop.com, SmartOnline.com wants to deliver a complete Web office for those starting a business. You'll find free legal forms and business letters, tools for developing business and marketing plans, a reference section, and a forum where you can discuss issues with other budding entrepreneurs. You can check out fine points in real estate law when you're considering signing a lease; you can crank out an NDA letter; you can produce a business plan that will get you taken seriously.

All online. All available from many kinds and sizes of Web-enabled computing devices, such as the new Web Companion that Bill Gates showed at Comdex in November.

And, like Desktop.com, almost entirely free. At least for now. (Some of the more complex customized legal forms on Smart-Online.com carry modest charges.) You can expect SmartOnline.com's revenue models to change as the site offers a wider range of more complicated services, for which it will likely charge. Or maybe it will run the services on an annual-subscription basis.

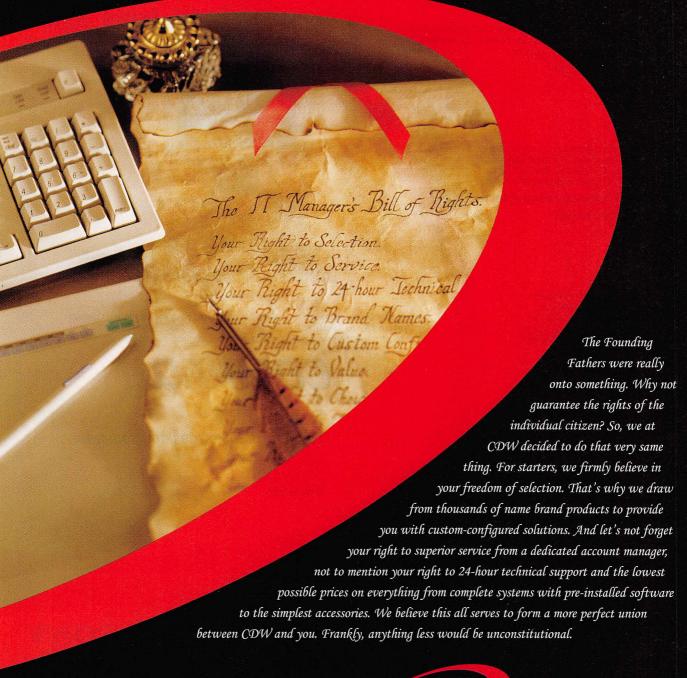
Web hubs such as SmartOnline.com and Desktop.com show that some people really get the power of working online. Buying a few seats' worth of PeopleSoft is cool, but buying into the idea of these business-tool hubs means a lot more to a lot more people.

All this starts making the Microsoft model look very...old. One venture capitalist I know says that in a couple of years, the idea of tripping down to CompUSA to buy shrink-wrapped software—or even downloading it from Beyond.com—will seem a cute but bewilderingly obsolete notion.

I doubt that. Lots of shrink-wrapped software remains to be sold. Lots of potential Web app buyers still have slow and only intermittent Web access.

But we know that will change. Will the software business also change—in time?

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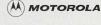






















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#### Bill Howard

# Rx for Personal Finance

What ails PC-based and online personal finance? Rising expectations is what. Whether you're talking about electronic bill payment, online services, investment tracking, preparing your expenses, or small-business bookkeeping, you'll find the glass is half full and half empty at the same time.

Here's what would get us farther past the basics and make personal finance work better.

Jump-start e-bills. Wouldn't it be great if you could receive and pay all your bills and bank statements electronically? E-bills, also called electronic bill presentment and payment or online bill presentment, holds that promise. The reality, however, is more like a promise unfulfilled. TransPoint (www.transpoint .com), a Microsoft/Citibank/First Data Corp. alliance for e-bills, has 33 merchants currently. Check-Free (www.checkfree.com) has 39. I am not a customer of a single one of the merchants (Orange County Register, Hawaii Electric Light Co., and so on). I mentioned the thin coverage to a PR person for TransPoint and asked when there'd be more participants. She fired off a follow-up press release a few days later: "TransPoint Expands.... With Agreement... [with] Australia Post." Like I said.

For e-bills to work, there would have to be hundreds of thousands of participating merchants, not dozens. There would have to be a a way to get a duplicate of your statement when you lose the copy e-mailed to you. And e-bills would have to work any way you want—through personal finance programs (like Quicken and Money), through Internet personal finance services and portals (such as Yahoo! Finance), or directly (CheckFree). The price should be somewhere between \$10 a month and free.

Make bill payments instant. The fact that electronic bill payment services want four or five business days to get a payment from you to the merchant is both amusing and annoying. It would be so simple to separate payees into those signed up for electronic funds transfers (EFTs), who could be paid overnight, and those getting paper checks, who still need a week—but this is generally not done. Quicken people once said, with straight faces, that this hasn't been implemented because it would create too much confusion for the user. Sheesh! You could get your payment there faster by first-class mail.

Make one-step updates do what the name implies. Quicken has a button marked One Step Update, which actually takes about two dozen steps, that I use to download information for my mutual funds and two credit cards. There are too many passwords, click-now-to-update buttons, and ill-behaved financial institutions. I'll be satisfied when my PC can come out of suspend at 6:00 A.M. and download all my information without any intervention on my part.

Kick your bankers into the new era. It took my local bank three years to accept an electronic payment (drawn on an account at the bank) for my safe deposit box. The bank is struggling to set up a way to download and then import transaction information into Quicken. I signed up for auto bill payment, and my credit card company lost both my electronic application and a faxed application. Every time I call to complain, I mention that there are lots of banks and credit card issuers out there and that I'm tempted to shop around for someone who understands e-banking a bit better. Actually, I can't switch, because my bank is good for at least one column like this a year—but there's no reason you can't.

What you can do now to automate your life. If you don't already, track your investments in Money, Quicken, or an online equivalent. Set up electronic bill payment (typically through CheckFree or your local bank). Set up auto payments, whereby merchants deduct payments from your bank or charge card. Watch for endto-end e-bills. The goal is to pay as many bills as possible without your lifting a finger.

What comes next. Check out Internet-only banks such as WingSpan.com to see whether you really can switch. Tell Intuit and Microsoft you want more features that work, including the basics. Lobby your employer to put your retirement, profit sharing, and employee stock-purchase info online and to allow electronic filing of your expense report. Keep an eye out for overnight electronic bill payment. When you can't pay every bill in full, it would be nice if the bill payment service could look at interest rates and calculate which bills would cost you the least to not pay in full. With the time you save on bill payment, maybe you'll have enough time to research eBay. PC



The goal is to pay as many bills as possible without your lifting a finger.

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#### INSTANT MESSAGING

nstant messaging (IM) is all about establishing a community. IM links people at home or work, providing a quick sense of presence and activity. Coworkers in the same building may never see each other, but IM can provide an instant personal link. E-mail lacks the spontaneous warmth of real-time interactions. Video conferencing is expensive, and the quality is often disappointing. And telephone calls too often connect with voice mail rather than the person you want to speak to.

IM says, "I'm here, talk to me!" It builds a framework for creating a dynam-

ic online community regardless of its members' locations. IM used within a business is a great way to reach and include remote workers. Its strength is in establishing a visible online presence that joins people from various geographic locations but allows them to interact as a group or individuals in useful ways.

Internet portals, such

as AOL, MSN, and Yahoo!, offer IM because it helps to solidify their online communities. The same thing can work in your business. In the online world, a friend tells someone that other friends or interesting people are on one of the popular IM public services, such as ICQ (owned by AOL). The person downloads the client software, runs the installation wizard, makes a first contact to another person (using what's commonly called a "buddy list"), and within minutes, they're

chatting. People can share their lists of instant messaging buddies and expand their interactive networks. It's easy, fast, informal, and fun.

#### CHAT CHALLENGES

There's also a serious business side to this technology. Though you can carry IM's ease of use into the business environment, its benefit comes with important security and resource considerations. If you use a public IM service to build a business community, it provides lowcost messaging, but you have no choice over who is using the service. You can

> hope conversations will remain focused on business, but you have little control over what proprietary information is escaping from the company through the IM channels. What's more, privacy issues, such as others monitoring your Internet activities, may be an unnecessary risk.

With the growing popularity of instant messaging, public ser-

vices aren't your only option. On the following pages, we examine public and private IM services that have high potential for business use. These services offer features far beyond online chat. For instance, ICO, the most feature-rich public service, offers file transfer, off-line message creation, and calendar reminders. It also accepts plug-ins for voice chatting and e-mail notification. Other public services are quickly seeing the business potential of their messaging

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## **Cover Story**

By Frank J. Derfler, Jr.



products. America Online, for instance, has announced the development of specialized IM chat screens for portable Internet devices. And Tribal Voice's PowWow includes a mini-Web browser that can be personalized for use as a corporate portal.

In general, the public IM services work effectively for fast business-to-business communications outside of the corporate LAN. The ability of nearly all of the IM programs to restrict messaging to a specific group of users is important to business managers. However, the question of reli-

ability and long-term security in public IM systems is wide open.

If you want accountability and the ability to keep everything within your firewall, then you need an internal IM system. We looked at Lotus Sametime and groupware versions of ICO and PowWow. The software costs for these

products range from the free download of ICQ Groupware, which is called a beta and not actively supported, to the over-\$5,000 Sametime package. For Sametime, you need a dedicated Windows NT server and enough Windows NT client licenses to cover all your concurrent users. The ICQ server is very easy to install, while the PowWow server requires Microsoft SOL Server.

Above all, the groupware packages give you control. An administrator can decide who is allowed on the private IM

Illustration by Bryan Leister

system and who can create specific buddy lists, though PowWow isn't quite as good at this as the two other products.

#### **WORKING TOGETHER**

The interoperability of the public service IM clients is a moving target. AOL is protective of its users. In the forthcoming update of MSN Messenger, Microsoft will end its attempts to link to AOL Instant Messenger. PowWow offers connections to AOL and MSN IM clients and will soon link to the basic message functions of Yahoo!'s client. But only

> Sametime allows interaction with AIM with AOL's blessing. ICQ is completely proprietary and has an unclear future because of AOL's ownership. There are two IM interoperability initiatives underway. One group backs the open source Jabber protocol, while another is

pushing the Instant Messaging and Presence Protocol (IMPP). It's safe to say that interoperability is on the horizon; we just don't know what it will look like when it gets here.

In the long run, IM will become a way to deliver a variety of communications and functions between individuals. The bottom line is that instant messaging can be a valuable tool to create community in your business, but choosing the right system is a balance between value and cost. Running your own system can be a burden, but at least you know who is in charge.

#### Instant Messaging

#### **Editors' Choice**

• Public: PowWow 4.0

Private: Lotus Sametime 1.5





Instant messaging provides expedient communications tools that can also help build community. Our two Editors' Choice selections exemplify how IM can

bring users together. Like all the public clients reviewed. Tribal Voice's

PowWow 4.0 is free. This latest version is easier to use, interoperable with AIM and MSN Messenger, and includes useful collaboration and community tools.

For companies with sophisticated needs, Lotus Sametime 1.5 is the right solution. It has strong management tools and a user-friendly client. Developers can integrate Sametime's realtime communications features into Web and Lotus Domino applications. And Sametime integrates with AIM with AOL's blessing.

Of the other products, AOL Instant Messenger impressed us with its ease of use and file-sharing capabilities, and its large user base can't be ignored. ICO's public and private versions are powerful but a little difficult to use. MSN Messenger has some useful features but is a typical Microsoft Version 1 product, which means you'll want to wait for Version 2. Tribal Voice's PowWow for Private Networks lacks management tools but is worth considering if you want to use PowWow on an intranet. And Yahoo! Messenger does a nice job integrating its client with Yahoo!'s other services.

#### **AOL Instant Messenger 3.0**

Free. America Online Inc., Dulles, VA; 800-888-833-1819; www.aol.com/aim.

• Don't let the pedigree fool you. AOL Instant Messenger (AIM) 3.0 comes from a consumer-oriented service, but it's also a robust business product. AIM's intuitive interface and file-sharing capabilities make it a good choice for businesses that don't want to host their own instant-messaging server.

AIM is a free 2MB download. Its setup takes moments, thanks to a wizard that walks you through such basics as adding names to your Buddy List. For more advanced functions such as file transfers, AIM's informative online help will get you up to speed. If you're behind a firewall, you can connect using a proxy server; AIM supports Socks 4, Socks 5, and SHTTP protocols.



AIM also facilitates Buddy List distribution within an organization. Save all your contacts or just selected groups and e-mail

Our Contributors: Frank J. Derfler, Jr. is the senior networking editor at PC Magazine. GREG ALWANG is a contributing editor, and ALAN COHEN is a frequent contributor. SHARON NASH is a staff writer at PC Magazine. Executive editor BEN Z. GOTTESMAN and project leader OLIVER KAVEN were in charge of this story.

them to other AIM users. Synchronizing lists is a bit more complicated because you have to distribute a new file each time you add or delete a name. AIM's preference menu also allows for plenty of control. You can block specific users or block everyone except a select group. You can even block all incoming group-chat requests. But once AIM is up and running, say good-bye to password protection. And unlike with Yahoo! Messenger and ICQ, other AIM users can add you to their Buddy Lists without your approval, and then they'll always know when you're online.

Despite these faults, AIM scores points with its clever file-sharing ability. Just as with Yahoo! Messenger and ICQ, you can send files to anyone on your Buddy List. AIM also lets you share folders with other users. AIM 3.5, currently in beta, will include voice conferencing.

AIM now provides limited interoperability. In addition to fellow AIM users, AOL and CompuServe 2000 buddies appear on your Buddy List, but only AIM users can join group chats and send or receive files. Unlike ICQ, MSN Messenger, and Yahoo! Messenger, AIM doesn't integrate a free e-mail account, and you can't send or check mail directly from the client. Also missing are a calendar and the ability to create messages off-line. We don't consider these big negatives on the whole. AIM's ease of use and enhanced functions make it a sound messaging tool for business.—Alan Cohen

#### ICQ 99b/ICQ Groupware 1.12 Beta

ICQ 99b: free. ICQ Groupware: free. Server requires: Intel x86-based system, 32MB RAM, 10MB disk space; Microsoft Windows NT 4.0 with Service Pack 3 or later. America Online Inc., Dulles, VA; 888-833-1819; www.icg.com.

• As a pioneer of free real-time communications, ICQ 99b boasts a huge, worldwide following—over two-thirds of its claimed 42 million users live outside the U.S. Netizens are drawn to ICQ's feature-packed IM tools and the international community that its portal reflects. On the corporate side, ICQ Groupware 1.12 Beta provides businesses with the benefits of ICO's realtime features from behind a firewall.

ICQ 99b's client runs on more platforms than any other program in our roundup. It even runs on Windows CE and Palm OS devices. Its selection of plug-ins adds messaging features such as voice chat



Choosing a messaging tool for the business environment is not an easy task. We looked at public clients that rely on servers outside of your network as well as solutions that let you keep administrative control within your firewall. Our tests focus on interoperability, security, and the ability to create virtual communities.

SERVER	ICQ Groupware 1.12	Lotus Sametime 1.5	for Private Networks
Installation	Excellent	Good	Fair
Administration	Good	Excellent	Poor
Security	Good	Excellent	Fair

EDITORS' CHOICE

**PowWow** 

PUBLIC SERVICES PRIVATE SERVICES				EDITORS' CHOICE			EDITORS' CHOICE	PowWow
CLIENT	AOL Instant Messenger 3.0	ICQ 99b	MSN Messenger 1.0	PowWow 4.0	Yahoo! Messenger	ICQ Groupware 1.12	Lotus Sametime 1.5	for Private Networks
Installation	Excellent	Good	Excellent	Excellent	Excellent	Good	Excellent	Excellent
Address book	Fair	Good	Poor	Good	Good	Good	Excellent	Good
One-to-one messaging	Good	Excellent	Fair	Good	Good	Excellent	Good	Good
Group and moderated chat	Good	Excellent	Poor	Excellent	Good	Excellent	Good	Excellent
Interoperability	N/A	N/A	Poor	Good	N/A	N/A	Fair	N/A
Security	Fair	Excellent	Fair	Good	Fair	Excellent	Excellent	Good
Additional features	Fair	Excellent	Poor	Good	Good	Good	Good	Good
Ease of use	Excellent	Fair	Good	Good	Good	Fair	Good	Good

N/A-Not applicable: The service does not have this feature

and e-mail notification. Although plug-ins can extend ICQ, the basic client has plenty of useful features. Business users will like its message history feature. Dial-up access users will like its off-line message-creation capabilities. And everyone will appreciate its built-in crash recovery.

A registration wizard automates instal-

-IDIX

Dismiss Remind Again in 5 Minutes

lation and gives you a

unique Universal Internet Number (UIN) that others will use to con-

tact you. Unlike MSN Messenger and PowWow, you don't have to provide an e-mail address to sign up. If you're behind a proxy or firewall, ICQ lets you configure the firewall settings.

The ICQ interface looks cluttered, but you can run it in two modes—Simple or Advanced. Simple mode displays only basic IM features, such as Find Random Chat Partner, Add Users, and the System Menu. Switching to Advanced mode enables all features, including the Services menu, which links to reminders, notes, todo lists, e-mail, and message archives.

You can view contacts by online/off-line status and by group. You can even have contacts float on the desktop for immediate access.

ICQ 99b's random chat and the ICQ Now! guide to popular chat rooms, topics, and interest groups are fun but of limited value to businesses. If you specify interests

> in your profile, an ICQ plug-in sends you messages about ICQ Now! that updates match your profile. Just as AIM's Allow and Block lists guard

> > your privacy, ICQ's Ignore, Invisible, and Visible lists let you deny or approve messages from others. You can also filter objectionable words that may appear in messages.

> > PC Magazine Labs tested the public beta version of ICQ Groupware 1.12 with the ICQ corporate client (the public and Groupware clients are not interchangeable, and AOL doesn't provide customer support for the

software). As with Lotus Sametime, the setup routine installs and configures a basic back-end database on your Windows NT server, but you can also connect to an existing database server such as an Oracle or Microsoft SQL Server. The comprehensive Administration utility centrally manages users, security, and firewall settings. With it you can review all registration requests while determining which users can be added to other ICQ users' contact lists. You can also monitor basic server usage and events, but not at the same level of detail as with Sametime.

The Windows-only ICQ Groupware client is based on an older version of ICQ and lacks the fresh features being added to the public version. Still, for business use, ICQ Groupware offers good instantmessaging and administrative features.

If you don't need external connectivity with other IM services or integration with corporate e-mail products such as Lotus Notes, consider ICQ Groupware 1.12 Beta for your Intranet. As a public IM client, ICQ's feature set is unsurpassed, but its cluttered interface and lack of interoperability prevent ICQ from being our Editors' Choice.—Greg Alwang

#### **Lotus Sametime 1.5**

Starts at \$5,000. \$20 per user. Server requires: Pentium/166, 128MB RAM, 300MB disk space, Microsoft Windows NT 4.0 with Service Pack 3. Lotus Development Corp., Cambridge, MA; 800-437-63910; www.lotus.com/sametime.



Lotus Sametime 1.5 delivers real-time productivity tools that integrate with Lotus Notes and Lotus Domino, but you don't have to make an investment in either to get all its benefits. With features

including online awareness, group chat, threaded discussions, and application sharing, Sametime lets businesses collaborate in real time over an intranet or the Internet. Though it's expensive, no other IM tool offers businesses the same level of groupware integration, administrative control, and extensibility.

Sametime installs easily on a Windows NT server, but when it's teamed with Domino, you need to be certain that the

#### Surf and Chat

A key personal instant messaging feature is a meet-and-greet function, which lets you find and talk to others who happen to be online when you are. Whether "random chat partner" on ICQ or "find a buddy" on AIM, this is the basic stuff instant messaging is made of. Hypernix Technologies' Gooey 2.0 (free download) extends this feature by enabling surfers to share the experience of specific Web sites

Gooey is more of a community-building technology than a Web business tool, but its features do have business potential. With Gooey's second version, the designers added a news headline ticker and streaming video support. But other features make it useful also for exchanging comments and ideas related to Web sites.

Surf a site and Gooey's Nicks (nickname) window tells you if other Gooey users are there. If so, click on a name and send a message. You can add a person to your buddy list, though you won't be able to see which sites your buddies are browsing, so they need not worry that they're under constant surveillance. And a Gooey feature called Hitwave tells you where the action is, listing the top

00000000

Readers Rate the Web

100 sites frequented by other Gooey users.

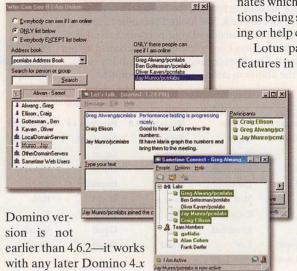
By default Gooey updates the Nicks window whenever you visit a new site, but by hitting the Spike button, you can keep your Gooey persona

attached to one specific site and then surf at will. This is particularly handy for people who run businesses on the Web and who want to interact with customers as they go about their work

As an IM client, Gooey is strictly bare-bones. True, you can send files and off-line messages, but its chat options are limited to one-on-one in an IRCstyle window or in a group chat with all site users. Also, there's just one line to enter messages, and no way to pick and choose users for a multiparty conversation.

Though Gooey does a great job finding buddies, you may be better off talking to them via a more robust IM client such as AIM or ICQ. But Gooey is just getting off the ground, and we're looking forward to its next version.

Today there are few sites with Gooey users onboard. It's a slow start, but a promising one. (Hypernix Technologies Ltd., Tel Aviv, Israel; 972-3-620-3832; www.gooey.com.)—AC



release. When working with Domino, installation is straightforward as long as you understand your existing domain setup. If installed in a non-Domino environment, Sametime, like ICO Groupware, installs its own server back-end to store the address book, meeting center, and threaded discussion data.

> This saves you from fiddling with a database installation on top of the Sametime installation. Setup simply requires pointing a browser to the Sametime start page on your server, where users can register and download the Windows 95, 98, or NT clients.

Unlike PowWow for Private Networks, Sametime keeps a central address book on the server, and in Domino environments, it shares the public Notes address book. From the Connect Client, users can add addresses and sort them by online status, send instant messages, and drag invitees into a group chat. Sametime is interoperable with AIM, as well as with Microsoft Outlook and Netscape Messenger. Meetings and discussions are accessed from the client or a Web browser.

Notes users can access these collaboration features directly from the Notes client. The Meeting Center lets you schedule and monitor online meetings and even share applications with other Sametime users via a browser, the Notes Client, or Microsoft NetMeeting. When sharing applications, all invitees view the host's screen in a window, and the host designates which users can "drive" the applications being shared—great for online training or help desk support.

Lotus packages Sametime messaging features in components, such as "Who is

> Online" or "Who is Here" Java applets, so IM functionality can be harnessed in other Notes and Web-enabled applications. For instance, a Sametime-enabled form can include an icon indicating whether a message sender is online. This lets you simply click the icon and start an instant chat with the sender rather than responding via e-mail.

The Web-based administration lets you control user access, set security options, and monitor usage statistics such as server traffic, maximum connections, and meeting and threaded discussion use. Sametime is the most secure of the intranet-based IM packages we looked at. It supports client certificates and secure connections through HTTP and SSL protocols. It also supports proxy setups, so users can communicate with external contacts via AIM.

Although Sametime doesn't provide voice messaging or file transfer, the combination of Domino and Notes integration options, strong security, administration, and application sharing is a powerful draw for businesses looking to enhance collaboration platform with real-time messaging.-GA

#### MSN Messenger 1.0

Free. Microsoft Corp., Redmond, WA; 800-426-9400; http://messenger.msn.com.

 Microsoft may have arrived late to the instant messaging party, but it's hoping to walk away with some of the prize market share that AOL, ICQ, and Yahoo! have already feasted on. MSN Messenger 1.0's attempts to interoperate with AIM in the version we review here ended with Microsoft's eliminating AIM interoperability in its recently announced 2.0 client. And while the first MSN Messenger boasts a few nice features, it lags far behind as either a personal or businessmessaging client.

You'll need a Hotmail account to get started with the 325K MSN Messenger

#### Instant Messaging

download. Given the download's small size, it's not surprising that the MSN client is missing basic features, such as file transfer, text formatting, or the ability to organize contacts into groups. But MSN Messenger works with a Socks 4 or Socks 5 proxy server on an office network and offers good network setup help.

Like AIM, MSN Messenger lets you create an Allow list, which automatically blocks everyone except your vital contacts. And MSN Messenger's authorization tool notifies you whenever another Messenger user adds you to his or her Contacts list. It automatically adds a user to the Ignore list if you deny the user permission to contact you. Yahoo! Messenger makes you do this manually.

MSN Messenger's integration with Microsoft Outlook Express 5 means you'll see the status of other Messenger users in Outlook's Contacts pane, letting you send an instant message without separately opening the MSN Messenger client.

Unfortunately, MSN Messenger's other features do not work as well. Contact lists are stored on MSN's servers, so you can access them from any machine. But you can't distribute them to other users or maintain a centralized directory of enterprise-wide MSN Messenger users. Also, there are no user profiles, so you can't search for Contacts using keywords, as you can with ICQ.

Although there are fewer windows to



one for both one-

on-one and group

chats-MSN

Messenger's interface doesn't work as well as those of AIM and Yahoo! Messenger. For example, incoming Hotmail alerts appear for a few seconds and disappear.

---Type a Web Search---

Not logged on to all services

And you can send e-mail to an off-line contact, but only via Hotmail. (Yahoo! Messenger and ICQ let you choose your e-mail

MSN Messenger possesses two features users will like. The first is an alert that tells you when a contact is writing a message to you (so you know not to log off). The second is a command to invite contacts to an online game or NetMeeting session. But it's not enough to make MSN Messenger 1.0 our choice for business messaging.—AC

#### PowWow 4.0/PowWow for **Private Networks**

PowWow 4.0: free. PowWow for Private Networks: \$3,995 for 25 clients, additional clients from \$9 to \$19. Server requires: Windows NT 4.0 with Service Pack 4, Microsoft SQL Server 6.5 or 7.0, 128MB RAM, Tribal Voice, Scotts Valley, CA; 877-476-9969; www.tribal.com.



For this review, we looked at a cobranded PowWow client called AltaVista Messenger. It has nearly all the same features and functions as the PowWow 4.0 client, which will be available by the time

you read this.

Tribal Voice's PowWow 4.0 has built a loyal following by providing a unique blend of messaging features and rich, user-hosted communities. It boasts interoperability with AIM and MSN Messenger and includes a proprietary browser. Tribal Voice's PowWow for Private Net-

> works (PWPN) lets businesses take advantage of Pow-Wow's robust features from behind a corporate firewall.

> PowWow's client is as intuitive as AIM's and, unlike ICQ, sports a clean interface while packing in a host of features. You can communicate in real time, collaborate using a whiteboard, transfer files, and take users on Web tours. As with ICQ, you can specify which IM events to permit

and which to refuse. In Away or Do Not Disturb mode, an answering machine will take your messages.

PowWow lets you put AIM and MSN Messenger users on your Buddy List (if you have an account with each), giving the service a huge combined IM user base. Unlike AIM and ICO. PowWow

#### Real-Time Help

Although e-commerce is more popular than ever, companies are finding it hard to keep their customers satisfied online. Fickle and easily put off by confusing Web page layouts or frustrating transaction delays, online buyers want a human being who can assist them when they need help behind the slick sales facade.

Enter real-time customer support. Using a mix of instant-messaging technologies, customers can immediately chat (via text, voice, or Web-based video) with a support person. Consumers can ask questions and receive immediate answers online while customer service reps can provide support services to more than one person at a time. There's a growing selection of real-time software tools and services designed to link buyers and support staff. Here's a list of some of the choices available to companies seeking to improve their online support services.

**CISCO CUSTOMER INTERACTION SUITE offers** text-based and Voice over IP (VoIP) customer support for \$1,500 per seat. (Cisco Systems Inc., Burlington, MA; 781-272-9979; www.cisco.com.)

EGAIN LIVE 3.0 offers text-based customer support and VoIP for \$200 per month per seat. (eGain Communications Corp., Sunnyvale, CA; 888-603-4246; www.egain.com.)

**FACETIME MESSAGE EXCHANGE 3.0** offers textbased customer support using IM clients such as AIM and Yahoo! Messenger for \$1,500 per month for three seats. Also provides Java and HTML interfaces (FaceTime Communications Inc., Foster City, CA; 650-574-1600; www.facetime.net.)

iSERVE 3.0 offers text-based customer support for a \$500 setup fee and \$250 per seat. (SneakerLabs Inc., Pittsburgh; 888-397-5227; www.sneakerlabs.com.)

iSESSION offers text-based customer support for 3 cents per minute. (Sessio.com, Seattle; 206-956-8000; www.sessio.com.)

LIVEPERSON offers text-based customer support for a \$500 setup fee, \$250 per seat. (LivePerson Inc., New York; 888-245-8005; www.liveperson.com.)

LOTUS SAMETIME 1.5 offers text-based customer support via the \$5,000 Lotus Sametime Server. VolP and video support are expected soon. (Lotus Development Corp., Cambridge, MA; 800-437-6391; www.lotus.com.)

NETAGENT 3.0. offers text-based customer support, VoIP, and video support starting at \$2,000 to \$2,500 per seat. (eShare Technologies Inc., Atlanta; 888-374-2734; www.eshare.com.)

QUINTUS WEBCENTER offers text-based and VoIP customer support starting at \$40,000 based on number of users and server fees. Video support provided with Microsoft NetMeeting. (Quintus Corp., Freemont, CA; 800-337-8941; www.quintus.com.)

VIDEOGATEWAY offers text-based customer support, VoIP, and Web video support for \$1,250 per month for five seats. (VideoGate.com, Charlotte, NC; 877-623-5087; www.videogate.com.)—Sharon Nash

#### SUMMARY OF FEATURES See www.pcmag.com for interactive views PC MAGAZINE Instant Messaging PUBLIC SERVICES EDITORS' CHOICE PRIVATE SERVICES **PowWow Lotus Sametime** ICQ Groupware for Private Networks Server Internet messaging, while most widely used by home users for chatting with Free \$5,000 plus \$20 For 25 users, \$3,995 friends, is more and more frequently being seen in corporate environments. Two Shrink-wrapped/downloadable 四 回 types of services have emerged for businesses: services connected via the Inter-GENERAL net such as AOL Instant Messenger and Yahoo! Messenger and intranet solu-Windows NT Windows NT Windows NT tions, such as Lotus Sametime and PowWow for Private Networks. 200 Maximum number of users per server 8,000 >100,000 Many businesses are simply using consumer services for quick communi-Windows NT 4.0 (SP4) Windows NT 4.0 Additional software required Microsoft SQL cations among employees, customers, suppliers, or consultants. But new (SP3), Lotus Sametime Server Server 6.5 or 7.0 groupware products have emerged that provide centralized, shared messaging Other databases supported ODBC Domino None databases. The best private groupware IM developers focus on delivering Supports T.120 / LDAF group-oriented features. They enrich their programs with shared buddy lists, Peer-to-peer message routing links to corporate e-mail, calendars, scheduling, message archives, voice capa-SECURITY AND MANAGEMENT bilities, whiteboards, and security features. With multiple platform support Weh Administration interface Windows None and robust clients, these intranet solutions move messaging management Firewall/Proxy support for connecting behind the corporate firewall. The best of the public service Internet solutions focus on providing envi-System log/Performance monitor ronments that can be easily adapted for a variety of uses-including busi-**CLIENT-SIDE OPTIONS** ness. Links to e-mail, calendars, scheduling, and voice features, as well as Client certificates interoperability make public IM services inexpensive but useful messaging Communities or group setup \* systems Address book on server or client Client Server Client PC MAGAZINE PC MAGAZINE EDITORS' CHOICE EDITORS' CHOICE **PowWow AOI** Instant MSN Yahoo! ICQ Groupware **Lotus Sametime** for Private Messenger (AIM) 3.0 Client ICQ 99b Messenger 1.0 PowWow 4.0 Messenger Networks SETUP Platforms supported Microsoft Windows 3.1 / 95, 98, and NT Java/Macintosh Microsoft Windows CE / Palm OS BU AIM, MSN AIM AIM\*\*. MSN\*\* Interoperability AOL, CompuServe None None None None Communities/Moderated chat □ N/A □ N/A □ N/A PROVIDER SERVICES Public chat areas N/A N/A News ticker (sports, stocks, movies) П N/A N/A N/A Free e-mail accounts available N/A N/A N/A N/A N/A N/A Personal communication center or Web page on providers site SYSTEM FEATURES Remote application/desktop sharing Web browsing on client interface Co-Web browsing **B** 200 Whiteboard 8 Calendar/Scheduling . Voice messages/Voice chat **100 100** 100 M Answering machine Away message (user defined/ screen saver-bound) Changes online status after inactivity Off-line only Manual None Message history Auto None None Auto Maximum characters per message 1,024 Unlimited 400 256 800 450 Unlimited 256 Automatically saves contacts to address book SECURITY AND SPAM Block list/Warning levels 麗 職 Profanity/keyword filter Secure sessions available Ability to hide profile/IP address 图图 N/A Can prevent others from adding you 0 to contact list

\*\* Cannot connect to private network and external service simultaneously.

† Plug-in required.

N/A-Not applicable: The service does not have this feature

\* For address management only

runs only on Windows.

Also unlike ICQ, PowWow's client works with both the public service and PWPN. In either

case, users maintain their own address books and can restrict who can communicate with them by including addresses their Blocking Books.

The most compelling feature of PowWow is the user-hosted community option (\$49.95 a year per community). Any user can start and moderate an IM community, control who has

access, enable profanity filtering, and maintain an access list. When you visit a community, its members are dynamically added to your Buddy List and then removed when you leave the community. These features are also available in PWPN.

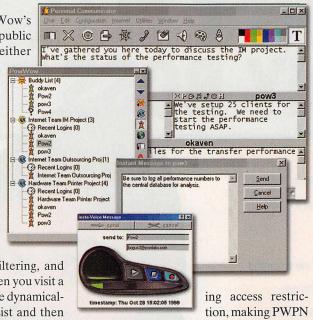
A voice messaging feature lets you conduct real-time voice chats without launching a third-party utility or plug-in, and a text-to-speech option lets you hear discussions in group chats and communities.

PowWow uses direct point-to-multipoint communications, thus bypassing a central server. This reduces network traffic and minimizes latency between connections. PowWow's central server must be accessed periodically, however, to update your Buddy List.

Since PowWow doesn't support proxy servers directly, you'll have to consult the Web site and your network administrator to open the appropriate ports on your server. Before you install PWPN you must first install Microsoft SOL Server 6.5 or 7.0. PWPN then establishes a connection to the SQL database server and initializes the data files. Although the documentation walks you through the steps, familiarity with SQL's Administration tools is a must.

PWPN lacks administration tools; once installed, it just runs. All user and community control is handled by the users, includ-





an undesirable tool for businesses that need to monitor in-house IM usage.

Though its SQL Server requirement is hefty in cost and expertise, PWPN offers businesses powerful IM features while keeping messaging in-house. As a public service, PowWow's comprehensive communication and community tools offer an excellent way to interact with contacts on a wide array of services. —GA

#### Yahoo! Messenger

Free. Yahoo! Inc., Santa Clara, CA; 408-731-3333; www .yahoo.com.

Yahoo! Messenger is an ambitious IM client that offers e-mail integration, file transfer, group chat, voice confer-

encing, and message alerts. With Yahoo! Messenger, you can create off-line messages and store contact information. AIM provides a cleaner interface, but Yahoo! Messenger succeeds in combining all the basic features you want in an IM client.

You'll need a Yahoo! account (which is free) to download the 1MB file, available at Yahoo!'s site (and nearly all shareware sites on the Internet). Like AIM, Yahoo! Messenger is easy to set up and lets you connect to the Internet through firewalls and proxy servers. The program has some handy security features, including password protection and the option of making your IP address invisible to other users.

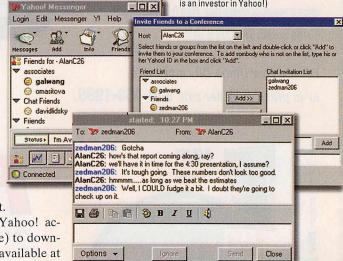
Unlike AIM, Yahoo! Messenger does not provide a simple solution to distributing contact lists. It relies on user profiles that are searchable on Yahoo!'s central database. But one-on-one and group chats are easy to manage, and if you want other users to think you're off-line, simply work in invisible mode.

Yahoo! Messenger's alerts are superb. They notify you of incoming mail plus link to Yahoo! Calendar events and Yahoo! Finance. You're not restricted to using Yahoo!'s free e-mail account, as with AIM and MSN Messenger. But unlike with ICQ, you can't read e-mail directly from the client.

Yahoo! Messenger is not interoperable with other IM clients, and though you can transfer files, there's a 500K limit. You cannot set up a shared folder, as you can with AIM. Finally, there's no peer-topeer file transfer, so all files are uploaded to Yahoo! prior to final delivery.

Yahoo! Messenger's tight links with personalized Yahoo! Web products will immediately attract numerous Yahoo! users. But as an integrated tool for business messaging, it's not up to the standards set by Lotus Sametime and Tribal Voice's PowWow.—AC

(Softbank, Ziff-Davis's primary shareholder, is an investor in Yahoo!) - 0 × Invite Friends to a Conference AlanC26 .



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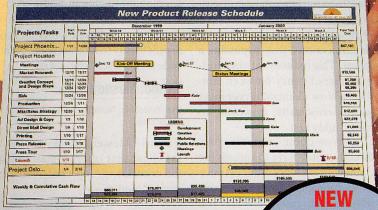
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# SHOW ME NOW



We look at five services that let you deliver your PowerPoint presentations and collaborate across the Web. Best of all, you can get started for free. *By Luisa Simone* 

ravel-weary businesspeople are anticipating the day when it is possible to have live, interactive meetings with far-flung clients and coworkers from the comfort of their home offices. Thanks to the Web's increasing bandwidth and a growing number of competitively priced hosting services, that day has arrived. Aside from the obvious benefits of reduced travel costs, Web-based meetings hold out the promise of a true collaborative work environment.

Compared with dedicated server solutions, Web-based presentation and conference services offer several advantages. They require little or no hardware investment, need only simple Internet access, and don't compromise network security. Best of all, hosting services are scalable, letting a

company hold meetings for small or large groups using the existing IT infrastructure.

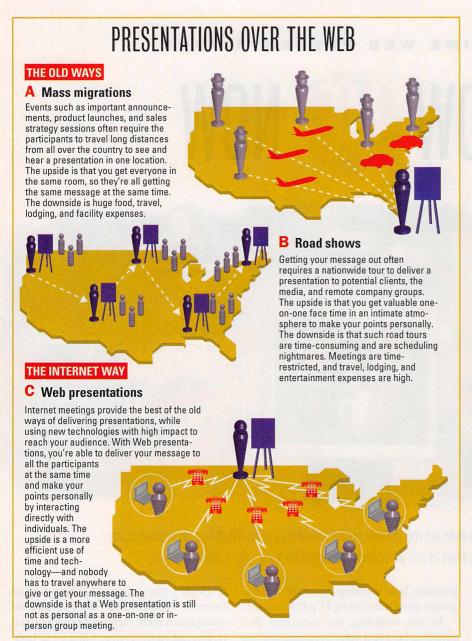
In this roundup, we compared five sites that host real-time presentations on the Net and run within a standard browser. Each provides hosting services on a sliding scale, from free trial versions for small meetings to versions capable of handling up to 1,000 participants. Though some of the services support streaming media, videoconferencing, or Voice over

Astound Conference Center	92
iMeet	93
MyPlaceWare/PlaceWare 3.5	
Conference Center	94
Presentation.Net	96
WebEx.com/WebEx Meeting Center	101
Editors' Choice	93
PC Magazine Labs Scorecard	94
Centra Now: Free for Now	96

IP (VoIP), the reality is that intranet and Internet bandwidths aren't reliable enough to handle such features adequately. Instead, most services will use old-fashioned (but reliable) text-based chat or companion telephone conference calls.

There are several features that an interactive meeting service should offer. Bringing a PowerPoint presentation to a Web-compatible format is important. Chat windows, annotation tools, and ad hoc audience polling are essential. Most of the sites reviewed also offer white-board markup, Web tours, and software demonstrations. A few services provide application sharing, and all utilize the standard HTTP protocol working behind network firewalls.

Because the Web—and more specifically, Java—holds out the promise of plat-



form independence, we tested all the products on PC Magazine Labs' Internet testbed using Windows 98 systems running either Microsoft Internet Explorer 5 or Netscape Navigator 4.7. We also included a system configured with Caldera Linux 2.3 running Netscape Navigator 4.6, and we even hooked up an Apple iMac. With a setup like this, we discovered that current Web-based meeting services are only reliable on Windows machines. Joining the conference from the iMac and Linux platforms produced slide shows that wouldn't advance, consoles that were corrupted or frozen, and even a few hard crashes.

Choosing the right conferencing site

requires knowing the type of meeting you want to hold. The style and substance of your meetings provide a lens through which to evaluate the site's actual features. If you hold collaborative meetings, you should place more importance on true application sharing and the ability to pass presentation controls to other attendees on the fly. If you conduct auditorium-style meetings (a one-to-many meeting model), you'll appreciate structural tools like moderated O&A. Of course. the size and frequency of your meetings have a direct impact on price. We found pinning down exact pricing structures was nearly impossible, and we expect that vendors will soon address volume pricing and integrated telephone conferencing.

In theory, conducting a Web-based conference is a simple five-step process: You register, schedule a meeting, invite attendees, convert a PowerPoint application, and host the meeting. If you're presenting to a relatively homogeneous Windows crowd, the processes flow smoothly. Glitches occur when you have to deal with missing media players, incompatible hardware platforms, and the need to install additional plug-ins for high-end functions. Even so, the benefits of providing spontaneous meetings in a virtual space are self-evident.

#### **Astound Conference Center**

Price: Standard 3-month contract: \$25 per user per month (concurrent), \$20 per user per month for extended 12month contract, \$15 per person for one-time events (10person minimum). Requires: Microsoft Internet Explorer 4.0 or later, Netscape Navigator 4.61 or later. Astound Inc., Los Altos, CA; 877-278-6863; www.astound.com.

• A Web-based service can change the face of its product with startling speed. Astound Conference Center's newly streamlined interface clearly presents the site's free services. These features are robust and include conversion of either PowerPoint or Astound presentations to DHTML, polling, annotation tools, Web tours, and chat functions. Astound does place some restrictions on free meetings. There's no limit on the length of a meeting, but you can include only three attendees and upload only 2MB of data. Paid subscribers can schedule recurring meetings, send e-mail notifications, and share applications.

Meeting setup is straightforward, and conversion occurs in real time as you upload a presentation. This lets you either meet immediately or schedule a conference for later. If your presentation requires a streaming media player or Astound's own application-sharing plugin, you'll have to download them before your meeting.

Astound preserves the animated builds

**Our Contributors:** Luisa Simone is a contributing editor of *PC Magazine*. Executive editor BEN GOTTESMAN and PC Magazine Labs senior project leader JAY MUNRO were in charge of this story.

#### **Editors' Choice**

#### WebEx.com



All of the real-time Web-based presentation services that we reviewed are relatively new, but

they have grown up quickly, and they are ready to save you time and money and make you more effective. The next time

you're getting ready to take a trip to make a presentation, consider whether it might not be done more efficiently over the Web. And the next time you pick up the phone to make a conference call, consider whether your message might be enhanced by a simultaneous showand-tell on the Web.

Our Editors' Choice winner, WebEx.com, gives you a complete, easy-to-use suite of presentation tools. Like all the services we reviewed, WebEx.com is available as a free service for small presentations. But it provides features and tools many of the others offer only with paid subscriptions. Presenters can set up a virtual office to store presentation-related information. And the service even notifies participants of upcoming presentations via e-mail.

Astound Conference Center and PlaceWare's My-PlaceWare and Meeting Center deserve honorable mentions. Astound has a long history of developing presentation software, and it shows. The service did an admirable job converting our presentations and even preserved animated builds. It was also the only service that told the presenter if the participants were on the same page.

We were pleased with both PlaceWare services and felt that Meeting Center's audience management tools made it especially well suited for large presentations. SneakerLabs' iMeet 2.0 worked well over slow connections, but ultimately its tools were inconsistent and not integrated well enough for us to recommend. Presentation .Net was in public beta during our testing, and the service clearly needs work before it's ready for prime time.



in a PowerPoint presentation by converting them to DHTML. This should help presenters maintain a regular speaking pace when presenting online. Screen updates are speedy for participants, provided they let the up-front caching operation go to completion before joining the meeting.

The chat feature supports public and private chat and reports the status of each attendee's screen. This vital information, which no other service provides, can help a presenter pace the meeting for users with slower Internet connections. Astound's Web preview window lets the presenter check the content of a site or page before displaying it. Polling functions include a graphical representation of the results. The annotation tools are more limited than free-form drawing tools but provide professional-looking markups (in the form of highlighting rectangles and stamps).

The service's 100K application-sharing plug-in lets presenters broadcast any open application on their system—including the entire desktop. Any approved viewer can then remotely control the application, but presenters need to be cautious about opening a program they haven't cleared for sharing. Participants will only see it as a blank rectangle on their screens.

Astound's VoIP feature doesn't

require a microphone. Dialing a toll-free number lets presenters digitize and broadcast narration to attendees (using the RealPlayer G2 program). The quality is a little better than using a microphone, and pricing is currently set at \$5 per attendee, with no time limit on the call.

We were surprised by the fact that subscriber pricing information is not clearly delineated or prominently displayed on Astound's Web site. In addition, a number of premium features, including archiving and surveys, were not available for review. They may be active by the time vou read this.

Astound has a long history of developing presentation and multimedia authoring tools for business users and consumers. It has put that experience to good use with the Astound Conference Center, providing functions that work within the limitations of Web bandwidth and most users' computer skills.

#### iMeet 2.0

Price: Subscription service, \$250 per month per block of 10 simultaneous users; event service, \$10 per hour per user (\$1,500 minimum); \$500 one-time setup fee. Requires: Microsoft Internet Explorer 4.0 or later, or Netscape Navigator 4.06 or later; Windows 95, 98, or NT for iShow 2.7.0. SneakerLabs Inc., Pittsburgh, PA; 877-244-6338; www.imeet.com

• SneakerLabs' iMeet service is truly a shared Web browser. Of the programs we tested, iMeet stays closest to the browser experience, adding only a small toolbar to the normal IE or Navigator window. It's even designed to begin a presentation with your company's home page, not with a slide. Although such an approach requires only a small download for the iMeet console, it also makes iMeet more vulnerable to the vagaries of the Web. During our tests, for example, a piece of perfectly normal JavaScript code on our home page caused iMeet to open a new window when we switched from it to our presentation. Suddenly having a slide show in one window with the Web tour and console controls in another window was confusing.

There are no functional differences between the free iMeet Web site and the paid services. Both deliver PowerPoint slide shows, Web tours, whiteboard markup, chat, Q&A functions, audience polling, annotation tools, and application sharing. iMeet, however, limits free meetings to five participants and 60 minutes.

If you are a registered user, the service provides a personal workspace where you can store converted PowerPoint presentations. When you set up a conference you can make any or all of the presenta-

#### INTERNET

#### Real-Time Web Presentations



To rate these Web presentation services, we looked at six critical performance factors. Installation and setup covers basic service features

such as registration, presentation preparation, and scheduling. Presentation features include tools such as cursors, highlighters, and pointers, the range of presentation materials supported, and the reproduction quality of original material. Application sharing involves capabilities that allow participants to view and interact with

programs running on a presenter's system. Selective screen sharing and remote controls are important factors. To judge client features we evaluate the user interface experience and platform support. Client-side controls such as annotation, highlighting, and presentation are key evaluation points. Instant messaging and chat reflects personal, presenter, and group interaction capabilities. One-tomany real-time chatting and Q&A filtering are prized features. Polling and surveys covers group query, response, and result features. The ability to tabulate and report polling or survey results is a key factor.

	Astound			D4-4	EDITORS' CHOICE	
	Conference Center	iMeet	PlaceWare	Presentation .Net	WebEx.com	
Installation and setup	Good	Fair	Good	Fair	Excellent	
Presentation features	Excellent	Fair	Good	Poor	Excellent	
Application sharing	Good	Fair	Good	N/A	Excellent	
Client features	Excellent	Fair	Fair	N/A	Good	
Instant messaging and chat	Good	Fair	Good	N/A	Good	
Polling and surveys	Good	Good	Good	N/A	Excellent	
N/A-Not applicable: The product does	not have this feature.					

tion sets available and switch between them during a meeting.

In consideration of bandwidth limitations, iMeet converts PowerPoint slides into simple GIF images, providing smaller files for Web transfer. It also converts slides into two additional images—one to view and one to annotate—that automatically download with a Java applet. This lets viewers either expand the slides to fill the screen or mark them up.

If you're presenting to a large group, you'll appreciate iMeet's Q&A features. You get a question queue and the option to respond publicly or privately. We like iMeet's polling functions, which can create structured questions (true/false or muiMeet adds a tually exclusive multiplesmall toolset to choice) and display the your browser's interface. results in different ways.

Unlike the presentation console, iMeet's applicationsharing plug-in, iShow, requires a lengthy download and installation. Although we've seen a working demonstration of iShow's application sharing, we were unable to use it to broadcast an application in our PC Magazine Labs testing.

Because iMeet's chat window logs every event, including the URLs and slides that have been opened, it's cluttered and difficult to read. And even though SneakerLabs says iMeet supports streaming media and Voice over IP, the functions aren't truly integrated. Attendees are merely delivered to the URL chosen by the presenter within the context of a Web tour. But the iMeet help feature is a real standout. Help opens a chat window to a live technical-support person. This is a great demonstration of SneakerLabs' iServe product. Based on IM technology, iServe lets e-commerce vendors provide real-time support to customers on the Web.

> Even though its browser-based console and options for simple slide formats make iMeet a good choice in limited-bandwidth situations, its inconsistent performance doesn't let us recommend it at present.

FIRE Province security for questions.

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#### MyPlaceWare/PlaceWare 3.5 **Conference Center**

Price: PlaceWare 3.5 Conference Center, \$300; annual hosting fee, \$375 per seat plus 15 percent annual support fee. Requires: Microsoft Internet Explorer 3.01 or later, Netscape Navigator 4.01 or later. PlaceWare Inc., Mountain View, CA; 888-526-6170; www.my.placeware.com, www.placeware.com.

• PlaceWare maintains two virtual addresses for online conferences and presentations: MyPlaceWare, a free service designed for small meetings, and Place-Ware 3.5 Conference Center, a paid service best suited for large online events. Getting either client up and running takes some time and effort, and presenters will find that the Java console, the presentation uploader, and the LiveDemo utilities all require separate downloads. But most will consider the benefits of each client's slick 3-D button interface worth the wait.

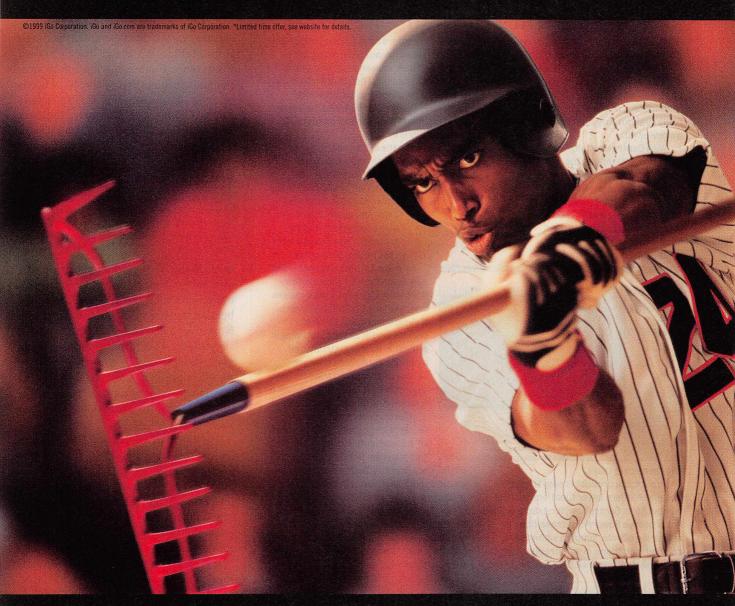
MyPlaceWare limits the number of attendees to five but has nearly all the functions of PlaceWare 3.5 Conference Center. The service uses a slide metaphor to represent adding any kind of content to a meeting. So conducting a Web tour, posting polling questions, switching to LiveDemo mode, or opening a whiteboard all begin as new slides, which you can add on the fly. This ensures that the content you upload or create during a presentation stays where you placed it. MyPlaceWare also provides a unique feature that creates text slides, which meeting attendees can copy from the presenter's system to their own. And its SnapShot slides provide a mechanism for annotating screen captures.

There's a lot to like about MyPlace-Ware. When scheduling a meeting you can send e-mail notifications, and visitors' systems are automatically checked for client compatibility. The annotation functions for both slides and whiteboards offer lots of drawing tools and stamps. The presenter can configure the attendees' interfaces to

> include (or exclude) functions like slide creation. And best of all, MyPlace-Ware supports multiple sets of slides; you can switch among them freely in the course of a meeting.

> A tool converts Power-Point presentations to static images—without transitions or animated builds.

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Solutions for People on the Go"

# FREE FOR NOW

entra Software's CentraNow is a terrific service for presentations limited to 30 minutes, five participants, and 1MB of data. Currently, there's no feebased version that goes beyond these restrictions, so the product cannot be fairly evaluated against the other services we reviewed.

With CentraNow, all meetings must start immediately, as there are no tools to schedule conferences. When you set up or join a All of Centrameeting, CentraNow loads the **Now's functions** necessary Java applet onto are accessed your computer. CentraNow's through easyinterface is made up of easyto-identify icons. to-identify icons that invoke

voting. Presenters have access to a window that can simultaneously capture and broadcast their screens, but true collaboration isn't possible. Though not specifically listed as a requirement, the presenter must have PowerPoint installed, because the conversion from the PPT format to GIF images is done locally.

Despite these shortcomings, we found no performance glitches. To

its credit, Centra Now integrates VoIP easily, though the Voxware codec exhibited expected audio delays. We also like the fact that the presenter can pass control of the microphone, chat

window, or polling questions to any attendee. But since Centra-Now does not cache slides, images can take long to download over a dial-up connection. Centra's background in distance learning is evident in its highly structured meetings. By default, a viewer cannot interrupt the speaker with a question but must instead click a raised-hand icon to be recognized.

Centra currently meets the needs of large groups with a server-based solution called Centra99. This program delivers sophisticat-

ed distance-learning features, user tracking, and scalable group collaboration at prices ranging from \$25,000 to \$45,000. (Price: Free for five users. Requires: Microsoft Internet Explorer 4.01 or later, Netscape Navigator 4.06 or later. Centra Software Inc., Lexington, MA; 781-861-7000; www.centranow.com.)-LS

CentraNo P 44 6 Average Online Spending, U.S Households

commonsense tasks.

In part, the product is easy to use, because it offers fewer functions than its competitors. CentraNow, for example, does not preserve PowerPoint transitions or animation effects, supply a whiteboard, conduct Web tours, or offer robust annotation tools. Polling consists of simple yes/no

The chat window supports only one-toone chat-making a conference call absolutely necessary. But unlike WebEx, the service does not offer true application sharing. The LiveDemo window effectively captures and broadcasts an application screen on the presenter's system to other attendees. And when conducting a Web tour, URLs on the viewers' displays are live, so each attendee can surf independently from the intended tour. Clicking on a slide in the presentation, however, returns control to the presenter.

Large groups requiring enhanced functions should consider upgrading to Place-Ware 3.5 Conference Center. Features such as its interactive seating plan let attendees give the presenter immediate

feedback by changing the color of their virtual seats. And a moderator can field questions, publishing only the relevant

ones. PlaceWare 3.5 Conference Center also supports VoIP and videoconferencing through its partnership with Activate .net, a company spe-

> Controls on Presentation .Net's window let you toggle between different tools.

Average Online Spending, U.S Households 3000 2500 1500 Forester Research 81 82 83 84 85 86 87 88 89 18 11 12 13 14 15 16 17 18 19 28 21 11

cializing in one-to-many communications.

PlaceWare completes its product line with a server-based solution for companies that want to host their own meetings. Both MyPlaceWare and PlaceWare 3.5 Conference Center provide robust presentation features that will meet the needs of most corporate and small-business users. Conference Center's audience management tools make it a standout service for large-scale Web presentations.

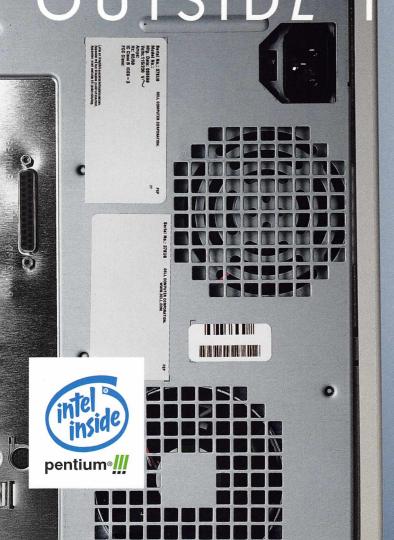
#### **Presentation.Net**

Price: 49 cents per minute per user (teleconferencing included). Requires: Microsoft Internet Explorer 4.01 or later, or Netscape Navigator 4.03 or later. WebSentric Corp., San Mateo, CA; 888-700-7777; www.presentation

• WebSentric's Presentation. Net bundles conventional telephone conferencing and online presentation. We tested a public beta version just weeks prior to an official November 1999 release. The service has a simplified, 49-cent-per-minute pricing plan, which includes a companion telephone conference call. As an introductory incentive, Presentation. Net is offering a free trial to new members through December 1999.

Setting up a meeting on Presentation .Net is a breeze, thanks to step-by-step instructions. Though we didn't experience any problems, there are initial delays. The process—which includes registration, scheduling, and off-line conversion of your uploaded presentation—requires four separate e-mail confirmations.

Presentation. Net successfully converts PowerPoint presentations to GIF images, as iMeet also does. Its Java-based console displays PowerPoint transitions. For a more dynamic presentation, import your A GOOD COMPUTER COMPANY IS LIKE A GOOD EMPLOYEE. IT CAN THINK OUTSIDE THE BOX.





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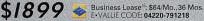
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BE DIRECT www.dell.com PowerPoint file into WebPresenter, a free Java-based authoring tool that generates true DHMTL.

A number of premium features were under development and not available for testing, including tools to poll participants, conduct Web tours, and demonstrate applications. Nor is there a chat window. So in addition to the slide show, we were able to test only Presentation. Net's whiteboard and annotation capabilities. Valuable features, such as the ability to import any slide from the presentation into the whiteboard or view PowerPoint's speaker notes, were offset by erratic performance. For instance, when we switched the presenter's display to full screen, highlighting was rendered at the wrong location on the viewers' screens. WebSentric confirmed that it is using absolute, rather than relative, window coordinates to render markup and said its next release will correct this problem.

During the presentation, there is no mechanism with which to promote an attendee to presenter status. You can give any participant presenter capabilities by forwarding a different log-on URL to him or her prior to the meeting, however. We liked that Presentation. Net buffers the slides so the screens of all participants update quickly.

We experienced technical difficulties invoking the service's secure transmission option. It launched a bug that prevented us from joining the presentation as attendees. More serious is that if a presenter loses the online connection during the meeting, the meeting is effectively canceled. The only solution is to schedule a new conference and start over.

Presentation.Net's \$500 trial offer effectively lets you host four 1-hour meetings. After that, you must pay for the service. For small meetings, using Presentation. Net beyond the trial period is more expensive than using another teleconferencing service that typically charges less than 30 cents per minute or a flat fee per user. If you conduct regular or large Web conferences, your costs may be lower due to WebSentric's volume pricing.

Though we expect that Presentation .Net's reliability will improve with the program fixes to be included with its official release, its services are still limited and relatively expensive compared with the competition.

# WebEx.com/WebEx Meeting Center

Price: Premium meetings, 15 cents per user per minute; Premium office, \$25 per month for up to four users (\$10 per month for additional users); Premium office with Remote Control, \$50 per month for up to four users (\$10 per month for additional users). WebEx Meeting Center: \$100 per user per month. WebEx Inc., San Jose, CA; 877-503-3239, 408-435-7000; www.webex.com.



WebEx.com distinguishes itself with meeting tools that are truly spontaneous and collaborative. Rather than requiring separate conversions and uploads, WebEx.com converts files to its own vector format

on the fly. It converts PowerPoint, and if the originating application is installed on the presenter's system, WebEx.com can convert a wide range of other data files, including AutoCAD, Excel, Freehand,

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1-2-3, and Word.

What's more, WebEx.com WebEx.com's functions, such delivers one-way demos, colas polling and laboration within specified annotation, are applications, and "remote contop-notch. trol" of another user's desktop. It also provides true application sharing, thanks to a hybrid technology that can best be described as the T.120 protocol wrapped in HTTP.

The service's feature set is comprehensive and includes whiteboards, annotation tools, polling functions, chat, VoIP, and Web tours. It also provides groups with a virtual office that includes an address book, calendar, and document storage folders. If you limit your meeting to four participants and 30 minutes, you can use almost every feature for free.

WebEx.com also offers a superb selection of aggressively priced premium ser-

vices. Its office subscription plan, which covers up to four users, beats all its competition on price. Beyond the premium offerings, WebEx also provides a customized hosted service called the WebEx Meeting Center. It's expensive, but it gives your business a branded interface and environment for virtual meetings.

Aesthetically, WebEx.com loses a few points. We couldn't preserve animation or transition effects from our PowerPoint slide. Webex.com's compression routines compromised the quality of the gradients and photographic images in our artwork. The most serious visual gaff appears whenever a presenter opens a program that hasn't been approved for sharing. As with Astound, the program displays a blank rectangle on the viewer's screen. Also, if you opt to use the Java console, you may forfeit important functions such as annotation.

> When you schedule a conference, you can set up recurrent meetings, notify attendees by e-mail, and choose which version of the client to make available to visitors. Since WebEx .com converts images to a vector format, you can zoom in on portions of the screen without degrading the type. And the annota-

tion tools work on slides, whiteboards, Web screens, and application windows.

All of its features are optimized for easy group interaction. VoIP is well integrat-

ed: A simple click of a button installs the Lipstream plug-in. Even when surfing the Web, the presenter is the only one with live links. The polling function lets you pose multiple-choice questions and share results in graphical form. At any time the presenter can promote an attendee to copresenter status. WebEx .com is also the only service that lets both presenters and viewers print the presentation slides and chat-window transcriptions.

Considering all of WebEx.com's strong presentation and collaboration tools, along with its breakthrough pricing, we've selected it as our Editors' Choice.

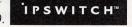


# WS\_FTP PRO. THE PROFESSIONAL WAY TO MOVE FILES.

10 million users worldwide can't be wrong. WS\_FTP® is the most powerful and reliable way to transfer files. And now with the drag and drop simplicity of its integrated Windows Explorer interface, WS\_FTP Pro 6.0 lets anyone download and upload files quickly and

efficiently. We've made it as easy as copying a file on your desktop. With this award-winning software, you can manage your Web site and share presentations, spread-sheets and large graphics files without bogging down mail servers. And with our new WS\_FTP Server, you've got the complete FTP solution for your enterprise.

Best of all, WS\_FTP Pro 6.0 and WS\_FTP Server come from Ipswitch, the leader in FTP. See for yourself why WS\_FTP won the PC Magazine 1999 Editor's Choice for Best FTP Utility, and Internet World's coveted Industry Award for Best Desktop Product of 1999.







# CENTRALIZED MANAGEMENT UTILITIES, PRODUCT-LINE CONSISTENCY, AND EASILY SERVICED CHASSIS SEPARATE THESE PCs FROM THE PACK.

# By Cade Metz

ime, as they say, is money. And nowhere in corporate America does time cost more money than in an IT department. The good news: Today's business PCs aren't the intractable contraptions they once were. In fact, they can be remarkably easy to deploy, manage, and upgrade or repair—and can be part of the solution to rising IT costs, not the culprit. The bad news: Nearly half of all IT managers ignore the management tools

that accompany almost every corporate PC on the market, according to International Data Corp.

That's a pity, because if you choose your PC fleet carefully, you can make upgrades without a screwdriver. If you buy intelligently, you can use a single software image for every one of your machines, readily swapping hardware among models. And if you use the management tools, you can monitor systems without leaving your desk.

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Compaq Deskpro EN 667	HP Vectra VLi8 MT110
Small Form Factor107	IBM PC 300PL110
Dell OptiPlex GX110	NEC PowerMate ES 5250112

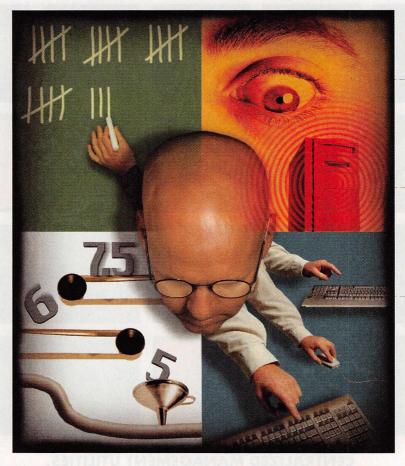
AF JOSEPH AND	
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Performance Tests	Managing an Enterprise120

# Take Inventory

All of the management packages let you query the PCs on your network for their vital stats: processor type, memory size, hard disk specs, graphics capabilities, OS and BIOS versions, serial number, and more. The better packages keep track of deployment and lease information.

# Update and Deploy Software

No more going from PC to PC with a disk. These packages let you automatically deploy driver upgrades, BIOS updates, and even (in some cases) complete OS and application loads to an individual user, a workgroup, or your entire organization—all from your management console.



# Identify Hardware Failures

The utilities also alert the network administrator to potential problems, such as a hard disk failure, a broken fan, or a chassis intrusion.

# Manage Multiple Brands

The latest feature is the ability to manage PCs from all the top makers, not just those from the manufacturer who supplied the software.

# REVIEW CRITERIA

We invited each of the leading corporate PC makers to submit a machine from its managed PC line. We asked the vendors to configure their entries with Windows NT; 128MB of memory; 10GB or larger hard disks; at least 8MB of graphics memory; 10/100 Ethernet adapters; 17-inch or larger monitors; and CD-ROM, CD-RW, or DVD-ROM drives. We also wanted systems that will be available through April of this year: A good managed PC should remain stable for at least a few months, letting IS managers create a consistent network of PCs and then seamlessly add to that network over time. Most important, we required that the machines comply with the Desktop Management Interface (DMI) 2.0 specification and that they offer some sort of desktop management application.

Seven manufacturers—Compaq, Dell, Hewlett-Packard, IBM, NEC, Systemax (a sister division of the popular direct vendor, MidWest Micro), and Toshiba—submitted machines for review. Acer, Comp-USA, Gateway, Micron, Quantex, and SAG Electronics were also invited to participate but were between product cycles at test time.

# MIDDLE MANAGEMENT

The desktop management applications that are provided with corporate PCs typically consist of two parts: a local component that sits on the PC you wish to manage and an administrator component that sits on a remote console and does the managing. These packages (namely, Compaq's Insight Manager, Dell's IT Assistant, Intel's LANDesk Client Manager, and HP's TopTools) should not be confused with enterprise packages such as IBM's Tivoli NetView, Computer Associate's Unicenter, or workgroup management packages such as LANDesk Management Suite and Microsoft SMS. An enterprise manager

lets you manage a sprawling corporate network, not individual PCs (discussed in the sidebar "Managing an Enterprise: Three Case Studies"). A workgroup manager oversees subsets of corporate networks, handling software-centric tasks such as remote control and remote software installation.

Desktop managers are also used with small and medium-size networks, and sometimes they include a few of the tools typically provided with workgroup managers, but they're primarily designed to inventory and monitor desktop hardware. A good desktop manager will use a Webbased interface, letting you query systems from any browser on your network. But in case you wish to handle all your management tasks from a single application, it will also integrate with popular enterprise and workgroup managers.

Intel's LANDesk Client Manager 6.0 is such a tool. Web-based, its administrator component can operate on its own or

# **Editors' Choice**

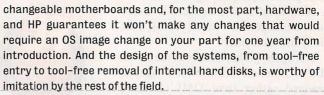
# HP Vectra VLi8 MT



The best managed PC for corporate users that we've found is the HP Vectra VLi8 line, represented here by the

Vectra VLi8 MT. HP has all the pieces of the puzzle right with this \$2,500 machine. Its remote management abilities, provided by HP's

TopTools utility, are second to none. HP's PC Image Engineer aids in large deployments, letting you boot any Vectra-regardless of the image you've loaded on its hard disk-then easily apply all hardware-dependent files (such as drivers) on the fly. The tool will also help with the creation and deployment of entirely new OS images. The VLi8 line consists of three form factors, all of which have inter-



The Compaq Deskpro EN line (we tested the \$2,350 Compaq Deskpro EN 667 Small Form Factor) merits honorable mention. Compaq's remote management software, Insight Manager LC, is just as robust as HP's TopTools, with one notable exception: It can't be used to power up or power down systems remotely. The

> Deskpro EN systems offer tool-free entry and hardware removal and three form factors in the product line. The Dell OptiPlex GX110 (\$2,546 direct) also deserves honorable mention. Unlike the Compag and HP packages, Dell's IT Assistant can't update system drivers remotely, but most other functions are provided. And IT Assistant was able to query the Compag and HP clients on our test network, though not machines equipped with Intel LANDesk.



be plugged in HP's OpenView, LAN-Desk Management Suite, Tivoli NetView, or Unicenter. However used, it manages only systems that are loaded with Client Manager's local component. In varying degrees, the DMI-based local component can also be read by third-party desktop managers.

Currently, Client Manager is the leading tool for taking system inventory. If properly configured, it can tell you how many free IRQs a system has, how much hard disk space is available, and which memory slots are occupied. If a PC includes certain monitoring hardware, Client Manager will also alert you to chassis intrusions, hard disk failures, fan failures, and more. It is capable of waking systems up, rebooting them, powering them down, and-with additional programming—updating drivers or flash BIOSs.

The NEC, Systemax, and Toshiba PCs reviewed here use Client Manager 3.3, which lacks a Web interface, but you can still manage them with the Version 6.0 administrator component, losing only a handful of features. At PC Magazine Labs, we were able to inventory these systems and do some monitoring, but they aren't equipped for remote software updates.

Desktop managers from Compaq, Dell, and HP don't provide as much inventory data as LANDesk does, and they lack its nearly perfect interface, but on the whole they're more effective than the LANDesk tools offered by NEC, Systemax, and Toshiba. Compaq's Insight Manager LC, Dell's IT Assistant, and HP's TopTools use Web interfaces, and their local components can be read from certain third-party DMI tools.

When used with Compaq Deskpro PCs, Insight Manager LC lets you remotely update drivers, BIOS settings, and flash BIOSs as well as take system inventory and monitor system health. It can't wake systems up, power them down, or reboot them, and it can't plug in to any of the market's enterprise managers. But it will plug in to Compaq's Insight Manager XE, a workgroup manager that handles such tasks as system backup and disk defragmentation. You'll have to use a separate utility, Compaq's Wake on LAN, to wake systems up.

Dell's IT Assistant is a similar package offering similar inventory and monitoring tools. Used with Dell OptiPlex PCs, it can't update drivers, but it will wake up, reboot, and power down machines. A clever interface also lets you sort through systems with greater ease than most. You can, say, list machines according to BIOS version or CPU. And though the package doesn't integrate with enterprise managers, you're able to print inventory reports and export data to Microsoft SMS.

At the moment, our favorite desktop manager is HP's TopTools. It can inventory HP Vectra PCs, monitor their health, update their drivers, update their BIOS settings, and flash their BIOSs as well as wake them up, reboot them, and power them down. For a fee, you can also include a remote-control application and additional tools for organizing and printing inventory data. Using software from the HP Web site, the package will also plug in to larger managers such as Microsoft SMS, OpenView, Tivoli NetView, and Unicenter,

Insight Manager, IT Assistant, and TopTools can all be used to manage thirdparty systems, but only if those systems adhere to the DMI 2.0 specification and only in a limited way. You can't flash BIOSs or update drivers. Inventory data is generally sparse and more difficult to read. Some health alerts show up; some don't.

IBM's desktop management tools do not adhere to the DMI specification. The 300PL is loaded with IBM's Universal

Our Contributors CADE METZ is a senior writer at PC Magazine. STEVE RIGNEY is a contributing editor to the magazine, and MICHAEL HURWICZ is a freelance writer. Senior associate editor JAMIE M. BSALES and PC Magazine Labs senior project leader RICHARD FISCO were in charge of this story.

Management Services agent, which can be read from such managers as LAN-Desk Management Suite, Tivoli Net-View, and Unicenter.

The agent gathers data via the newer CIM (Common Information Model) standard rather than DMI (Desktop Management Interface). CIM promises to be better than DMI at managing PCs in a heterogeneous environment, and most PC vendors will migrate to it in their next generations of corporate PCs.

Though the agent is certainly effective—it lets you take inventory, change BIOS settings, save software images, gain remote control of systems, and power them down-the system tested at PC Magazine Labs lacked IBM's new healthmonitoring tools. IBM bundles separate applications for loading software images, backing up files, and more.

In addition to these tools, the new Microsoft Windows 2000 operating system ups the management ante, letting administrators deploy software, control user access to applications, and recover data from deleted files and other configuration errors on the desktop (discussed in the sidebar "Windows 2000: The Managed OS").

# **FAMILY RESEMBLANCE**

Each of the managed PCs we tested belongs to a broader line of machines an approach that also helps save time and money. These "sibling" machines are consistent enough to use the same software images and the same pools of hardware, yet they are diverse enough to satisfy many different types of users



For remote management, we consider how robust the management utility is. In addition to the standard functions of checking PC invento-

ry and status, a better package lets an IT director flash BIOSs, load drivers, and deploy software remotely

Product-line stability addresses the manufacturer's commitment to keeping the platform consistent, so a customer can maintain a uniform OS image even over a long rollout period. The line should offer a range of chassis types, and a customer should be able to use a single OS image on those different machines.

For the chassis design rating, we consider how easy the PC is to service and upgrade. A better chassis allows quick access for IT staff. The interior should be roomy and uncluttered.

A machine that scores better in security offers a lockable chassis to prevent unauthorized access, as well as additional security devices (such as a smart-card or fingerprint reader) to discourage unauthorized access to the network.

Our service and support rating reflects a manufacturer's warranty, technicalsupport hours, Web support offerings, and score on our latest Service and Reliability Survey (July 1999).

	Remote management	Product-line stability	Chassis design	Security	Service and support
Compaq Deskpro EN 667	Good	Good	Good	Excellent	Good
Dell OptiPlex GX110	Good	Fair	Good	Fair	Excellent
EDITORS' CHOICE HP Vectra VLi8 MT	Excellent	Excellent	Excellent	Good	Excellent
IBM PC 300PL	Good	Good	Fair	Fair	Excellent
NEC PowerMate ES 5250	Fair	Fair	Fair	Fair	Fair
Systemax Mission PME-T600	Fair	Fair	Poor	Poor	Fair
Toshiba Equium 7100 D	Fair	Good	Poor	Fair	Fair

within an organization.

A well-designed family will offer machines with a wide range of processors (such as Celerons, 0.25-micron Pentium IIIs, and the new 0.18-micron "Coppermine" Pentium IIIs) and multiple chassis designs (mini-tower, desktop, and the small-form-factor). Ideally, you would populate your network with various machines from the same line.

In doing so, you could meet the needs of several different types of users yet make your network much easier to manage. Naturally, you could use the same DMI tool to oversee your entire fleet of PCs, but you could also simplify the deployment and upkeep of those systems. Within managed PC families, most of the machines use the same graphics engines and disk drives. Some manufacturers use the same motherboards from model to model. This accomplishes two things: It reduces the amount of hardware you have to keep on hand for repairs and upgrades, and it lets you use a common software image for multiple machines.

With a few exceptions, machines in these families are also remarkably easy to upgrade and repair. Some manufacturers let you slide a motherboard out of a mini-tower and slide it into a small desktop—all without a screwdriver. Others let you add and remove disk drives or PCI cards without tools. This means that when an upgrade or repair is necessary, a service technician can get in and out a lot faster.

All of which means the managed PC is not only easier to use, but it is also less expensive, at least in the long run. The reviews that follow should help you pinpoint the vendor that is right for you.

# www.pcmag.com/hotlinks

Visit our site for interactive views of the benchmark test results and the Summary of Features table from this story. For more on corporate managed PCs, try these sites:

# Distributed Management Task Force

www.dmtf.org This is the home page for the organization responsible for DMI and CIM (Common Interface Model), the standards by which most connectivity is implemented. Here you'll find links to development kits, downloads, and information.

# Wired for Management http://developer.intel.com/ support/desktopmgmt/

Go here for background, support, and drivers for the Wired for Management (WfM) initiative, a project by Intel and Microsoft for improving interactivity with desktops, servers, and notebooks.

# Management Suites www.compag.com: www.dell.com: www.hp.com/toptools: www.intel.com

Each of these sites is the home page for the proprietary management software package of its respective vendor. Go here for white papers, support, downloads, and information.

# Compaq Deskpro EN 667 Small Form Factor

Pentium III/667B, 8MB Intel graphics, 12.9GB 7,200-rpm hard disk, CD-ROM drive, 17-inch Compaq monitor. Street price: \$2,350. Business Winstone 99: 35.1. Warranty: 3 years parts and labor, 3 years on-site service. Houston; 800-345-1518; www.compaq.com

Benefiting from a new DMI application known as Insight Manager LC, the Compag Deskpro EN line is a worthy rival to platforms from other top-

tier vendors. The application's remote console lets vou inventory, test, and monitor Deskpro hardware. update certain Deskpro software, and-to some extent-manage third-party machines. You can't use the package to wake systems up. but the Compag Deskpro EN 667 Small Form Factor is a standout nonetheless.

Like other managed PC platforms reviewed here, the Deskpro EN line includes desktop, mini-tower, and small-form-factor models. The last of these requires a different motherboard than the others do, but all three models

contain the same basic hardware. The entire line—offering Celeron, Pentium III, and Pentium III Coppermine CPUs—

> will be available through the second quarter of this

year. Compaq typically maintains a corporate platform for 6 to 12 months and provides large customers with a road map of changes to the platform.

The Deskpro EN 667 uses a Coppermine processor and the Intel 810e core-logic chip set with an integrated graphics engine. The system performed fairly well on most tests, particularly on

our i-Bench suite. More important, the Deskpro EN 667 is a wellput-together machine. You can open the system chassis and remove disks with-

out tools, and a removable riser card lets you easily install PCI devices.

Like every new Deskpro EN, the Deskpro EN 667 is ready for use with Insight Manager LC, which can be downloaded from Compag's

Web site. Insight Manager LC will consistently monitor all Deskpros on your network, launching alerts if board temperatures are too high or a chassis is opened. But when it comes to inventory and other active tasks, the package handles one PC at a time. After choosing a particular Deskpro to manage, you can take inventory, run diagnostic tests, lock the unit's chassis, and much more. A separate package, Insight Manager XE, is available for a fee and lets you perform various other tasks (disk defragmentation, backup, and so forth) on multiple Deskpros at once.

We were particularly impressed with Insight Manager LC's software update tool. Using Compaq's Software

Support CD or the company's Web site, Insight Manager LC can automatically tell you what new drivers or BIOS files are available for any given Deskpro on your network. With only a mouse click or two, you can remotely load those files onto the appropriate machine. In addition, Compag posts a separate, free Wake on LAN utility on the Web: Insight Manager should be incorporating this utility in the near future.

Like NEC and Toshiba, Compag received a grade of C on our latest Service and Reliability Survey for office PCs, and technical support on the company's Web site is extensive. For the most part, the Deskpro EN platform is effective and complete.-CM

# Dell OptiPlex GX110

Pentium III/733, Intel 810e graphics, 13.0GB 7,200-rpm hard disk, CD-RW drive, 17inch Dell monitor. Direct price: \$2,546. Business Winstone 99: 37. Warranty: 3 years parts and labor, 3 years on-site service. Round Rock, TX; 800-388-8542;

This 733-MHz mini-tower compares well with leading managed PCs from Compaq and HP. The Dell Opti-Plex GX110 is slightly more expensive than most systems reviewed here, but it delivers a Coppermine processor and a CD-RW drive. You can't easily swap motherboards in and out of the chassis, as is possible with the Compaq, HP, and NEC machines, but the OptiPlex GX110 is friendly to upgrades and repairs. And although we had trouble managing certain third-party systems through Dell's IT Assistant management software, the package works reasonably well with others-and extremely well with the OptiPlex GX110.

The GX110 line consists solely of Pentium III machines; lower-end Celeron

systems are available through Dell's GX100 series. Like most major managed PC lines, the GX110 machines include minitower, desktop, and smallform-factor models. Since all three models use the same motherboard, you should be able to use a single software image across the line. Without making any guarantees, Dell tries to minimize platform revisions that could force changes in your common software image. Dell's ImageWatch program helps you make such changes.

The OptiPlex GX110 mini-tower boasts one of the best chassis designs we've seen. The cover is easily locked but just as easily opened for repairs and upgrades. You can remove all external disk drives without the help of tools, and a riser card readily slides out to facilitate the addition of PCI cards. Though you can't remove the motherboard without a screwdriver, Dell has put hinges on the system's power supply and internal drive bay, letting them swing away from the chassis to provide easy access to all corners of the motherboard.

Relying on the integrated graphics of the Intel 810e chip set, this system performed modestly on our Graphics

WinMark tests but scored extremely well on most other benchmark tests.

With a less expensive OptiPlex, you can still benefit from Dell's IT Assistant, a DMI application similar to Compag's Insight Manager and HP's Top-

Tools. Unlike those two packages, IT Assistant can't update system drivers remotely, but the program can remotely inventory any OptiPlex, monitor its health, flash its BIOS, reboot it, power it down, and wake it back up. To a certain extent, the package can also inventory and monitor third-party, DMI-compliant PCs. Though we couldn't manage the IBM PC 300PL or the LANDesk-equipped systems reviewed here, we could readily access the Compag and HP machines, and we did receive a few health alerts from them.

Like all OptiPlex models, the OptiPlex GX110 benefits from Dell's exemplary



technical-support programs. We're particularly impressed with the tools provided through the Dell Web site, including Filewatch, which will automatically notify you when new drivers or bug fixes are available for your particular system, Dell received a grade of A on our most recent Service and Reliability Survey.—CM

# Managed PCs



Speed is less of an issue for most corporate buyers than features mgazine and manageability are. Most of LABS the systems here performed

similarly—and all performed at least adequately for most business needs.

The ZD Business and High-End Winstone 99 tests measure system performance running real-world applications. For both Winstone scores, the HP Vectra VLi8 MT came out on top. The HP system achieved this feat by virtue of a fast CPU, a fast hard disk and, most notably, the fastest 2-D graphics accelerator here, the Matrox G200 (as measured by both Graphics WinMark 99 scores). The Systemax Mission PME-T600 was unable to complete the High-End Winstone test; we kept receiving a memory error, even after we installed new memory.

Our ZD Content Creation Winstone 2000 suite is more hotspot oriented than the other Winstone tests. Hot spots are periods of processor- or disk-intensive activity—the times when you're likely to see an hourglass or a progress bar. Therefore the system with the best CPU and disk subsystems will come out on top. As expected, the Dell OptiPlex GX110, which posted the highest scores on our CPU and disk tests, came out on top.

Our CPUmark 99 test measures the integer capabilities of the CPU and memory subsystem. With one exception, machines with faster-clocked processors posted higher scores than those with slower-clocked CPUs. The exception is the HP: Its 650-MHz Pentium III chip beat the 667-MHz Pentium III in the Compaq Deskpro EN 667. Both of these CPUs are based on an Intel Coppermine chip, but the Compaq machine, using the Intel 810e chip set, runs on a 133-MHz system bus with 100-MHz SDRAM (the maximum supported by the 810e). The HP system, using the Intel 440ZX chip set, runs on a 100-MHz system bus with 100-MHz SDRAM. We believe there is extra timing overhead needed to run the CPU bus at 133 MHz while the memory is running at 100 MHz (as is the case with the Compaq and the Dell) and that this adversely affects the scores.

The ZD Business Disk WinMark 99 tests show the performance of the hard disk subsystem while running the GDI operations of Business Winstone. The Dell and the Compaq entries, both of which use a Maxtor 91366U4 hard disk, came in first and second, respectively. The two systems with 5,400-rpm disks (the NEC PowerMate ES 5250 and the Toshiba Equium 7100 D) got the lowest scores; the other PCs in this roundup used 7,200-rpm hard disks. The ZD High-End Disk WinMark 99 runs disk operations based on High-End Winstone. Again, the Dell and Compaq came in first and second.

Our ZD Business Graphics WinMark 99 tests measure the proficiency of a PC's 2-D graphics subsystem. Based on the Matrox G200 engine, the Vectra VLi8 MT finished first. ZD High-End Graphics WinMark 99 is a more CPU-intensive suite and contains some 3-D OpenGL operations as well; this changes the way that the suite interacts with graphics subsystems compared with Business Graphics WinMark. While the VLi8 MT took top honors here as well, it was the Dell and Compaq machines—using the 810e chip set's integrated graphics engine—that came in second and third at 8 and 15 percent behind the VLi8 MT, respectively. The 810e chip set supports 100-MHz main memory; it shares this RAM for graphics tasks. Interestingly, the 810e can also support an optional 4MB of 133-MHz external SDRAM display cache, which is used for zbuffer. This memory helps increase 3-D performance. The Opti-Plex (which came with the optional memory) appeared to benefit when compared with the Compaq entry, as shown by the its High-End Graphics WinMark score.

The subset of ZD i-Bench tests that we ran measure the performance of the system when running typical Internet browsing functions on a LAN. Of course, a fast connection to the Internet is the most important factor, but with the connection kept equal on all systems—as we tested for this story—it's the performance of the system that matters. The Dell unit won five of the six tests, thanks to its fast processor and subsystems.—Analysis written by Rich Fisco

# **How We Tested**

We tested all systems with Windows NT 4.0 and 128MB of RAM; each system also had 10GB or more of hard disk space. We stripped each system's start-up configuration of all processes or tasks except for Systray, Explorer, and graphics card control panels. The resolution for all tests was set at 1,024-by-768, true color, and the monitor was set to 75-Hz refresh rate. We cleared the history and deleted the temporary Internet files between each run of i-Bench to prevent caching.

We used our benchmark test program ZD Winstone 99 to mea-

▼ The HP Vectra VLi8 MT was the best performer overall, as measured by our Business Winstone 99 and High-End Winstone 99 tests. The Dell OptiPlex GX110 bested the field on Content

Creation Winstone 2000 by a respectable margin, and it had the top-performing CPU and disk subsystems as well. The HP had the best-performing graphics subsystem.

High scores are best.  Bold type denotes first place.  Control of the best of	ZD Business Winstone 99	ZD High-End Winstone 99	ZD Content Creation Winstone 2000	ZD CPUmark 99	ZD Busi- ness Disk WinMark Thousands of bytes/sec	ZD Business Graphics WinMark	ZD High- End Disk WinMark Thousands of bytes/sec	ZD High- End Graphics WinMark
Compaq Deskpro EN 667	35.1	37.6	35.0	57.3	8,600	109	16,700	466
Dell OptiPlex GX110	37.0	39.5	40.3	63.2	8,770	114	17,100	506
PC HP Vectra VLi8 MT	39.8	39.9	35.2	60.2	8,230	179	16,200	549
IBM PC 300PL	32.8	32.9	30.2	39.3	6,560	168	14,100	340
NEC PowerMate ES 5250	30.6	34.0	35.0	44.4	4,220	127	11,800	379
Systemax Mission PME-T600	35.8	N/A	N/A	44.4	6,950	177	N/A	430
Toshiba Equium 7100 D	30.5	33.6	33.0	44.6	3,680	121	9,730	375
N/A—Not applicable: The product could no	BETTER ►	BETTER ▶	BETTER >					

ZD i-BENCH						
▲ High scores are best. ▼ Low scores are best.  Bold type denotes first place.  denotes Editors' Choice.	Load Complex Pages Seconds	XML: CSS Execution Seconds ▼	XML: XSL Execution Seconds ▼	VRML Frames per second ▲	RealVideo G2 LAN Seconds ▼	Java VM Score ▲
Compaq Deskpro EN 667	13	13	3	17	55	67,816
Dell OptiPlex GX110	12	11	3	19	68	78,426
PC HP Vectra VLi8 MT	20	18	3	19	68	71,175
IBM PC 300PL	20	12	4	15	70	53,580
NEC PowerMate ES 5250	15	12	4	17	68	59,151
Systemax Mission PME-T600	15	12	4	18	68	58,090
Toshiba Equium 7100 D	15	11	4	18	68	58,885
	District Market Control					

sure performance on 32-bit Windows applications. Winstone 99 is divided into two parts: ZD Business Winstone 99, focusing on mainstream applications, and ZD High-End Winstone 99, which emphasizes CPU- and graphics-intensive applications. Our Business Winstone 99 tests measure the time a PC takes to execute a set of scripts that exercise eight office-suite Windows 98 applications and an Internet browser. Our High-End Winstone 99 tests measure the time a PC takes to execute a set of application scripts that exercise seven Windows NT applications. High-End Winstone 99 weights a given machine's seven timings equally, derives a composite number, and converts that to a score.

This year we introduced **ZD Content Creation Winstone 2000**. Similar to our other Winstone tests, Content Creation Winstone measures the performance of a Windows 98 or Windows NT PC while running the following top Internet content creation applications: Adobe Photoshop 5.0, Adobe Premiere 5.1, Macromedia Director 7.0, Macromedia Dreamweaver 2.0, Netscape Navigator 4.6, and Sonic Foundry Sound Forge 4.5.

**CPUmark 99** is a processor-subsystem benchmark test that lets you measure the speed of a PC's processor subsystem, which includes the CPU, RAM, and RAM cache. CPUmark 99 simulates the CPU activity of the real-world 32-bit applications in Business Winstone 99. Since the applications in Business Winstone 99 do not use floating-point or MMX instructions, neither does CPUmark 99.

Like our Winstone benchmark test program, ZD Graphics Win-Mark 99 and ZD Disk WinMark 99 are each divided into business and high-end benchmark suites. The ZD Business Disk WinMark 99 and ZD High-End Disk WinMark 99 scores are based on a log of disk functions used by the applications in the Business Winstone and High-End Winstone suites and represent the performance of each machine's disk subsystem under Windows 98 and Windows NT 4.0, respectively. We record the results in thousands of bytes per second and convert them to a harmonic mean. We then weight this mean in the same way as the Business Winstone 99 and High-End Winstone 99 scores.

The ZD Business Graphics WinMark 99 and ZD High-End Graphics WinMark 99 scores are based on a log of GDI operations used by the applications in the Business Winstone 99 and High-End Winstone 99 tests, respectively. The Business Graphics WinMark score indicates performance on Windows 98, while the High-End Graphics WinMark score is run on Windows NT 4.0.

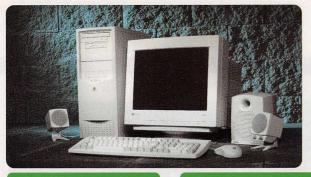
For testing performance on the Internet we used ZD i-Bench, a cross-platform benchmark test suite that tests a client's performance and capabilities using the latest Internet technology and features. Clients can range from a browser on a PC with a modem to a wireless hand-held device—anything that can display standard

▲ Thanks to its CPU and graphics subsystems, the Dell OptiPlex GX110 placed first (or tied for first) on five of the six i-Bench

tests, though the winning margins were often slight. The Compag and HP machines were also good performers overall.

HTML. The suite provides a series of tests that measure both speed and the scope of the client's features. We ran the following subset of tests on all systems. The Load Complex Pages test measures how quickly the browser can load and scroll pages of text and graphics. The eXtensible Markup Language tests measures how quickly the browser can download, format, and display XML pages. CSS (cascading style sheets) apply complex formatting to multiple pages, while XSL (extensible style language) lets users customize the way in which content on a Web page is displayed. The score is the time that it takes the browser to do these tasks, measured in seconds. The graphics-intensive VRML test evaluates Direct3D performance. Its purpose is to measure how well a system and a VRML client (we used Blaxxun Contact 4.2) display a clip containing a model of a helicopter. The Real Video G2 test measures how well your browsing environment handles RealVideo clips. The score is the number of seconds it took to play the clip. We ran a clip suitable for LAN playback, compressed at 150 Kbps. The Java VM test, a processor test, measures how well a system handles processor work with the Java VM.





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MAGA7INF

# HP Vectra VLi8 MT

Pentium III/650, 8MB Matrox graphics, 27.3GB 7,200-rpm hard disk, CD-RW drive, 17-inch HP monitor. Street price: \$2,500. Business Winstone 99: 39.8. Warranty: 3 years parts, 1 year labor, 1 year on-site service. Palo Alto, CA; 800-322-4772; www.hp.com.

The HP Vectra VLi8 MT comes very close to embodying the ideal managed PC. This mini-tower is one of several cleverly designed VLi8 form factors, all of which benefit from HP's TopTools management software. PCs in the line are also easy to upgrade and repair, and they use interchangeable components. Like Compaq, HP offers tools for remotely

updating system drivers. Unlike Compag, however, HP lets you wake machines up from its primary management console and swap motherboards with any of its own mainstream managed PCs.

The VLi8 line has three types of PC cases: mini-towers (designated MT), desktops (D), and small-form-factor

models (S). All use the same motherboards (with Pentium III or Celeron CPUs and 100-MHz system buses) and for the most part use the same additional hardware. Throughout the VLi8's 12-month life cycle, HP guarantees you'll be able to purchase a system capable of

using the same image as your existing VLi8 models. The life cycle ends in March, when a new product-likely using a Coppermine CPU and the 820 chip set-will debut.

In fact, you can even use the VLi8 MT with a software image specific to an existing third-party system. With HP's PC Image Engineer, you can boot any VLi8-regardless of what image vou've loaded on its hard diskand then easily apply all hardware-dependent files (such as drivers) on the fly,

leaving all hardwareindependent files intact. The tool will helps with the creation and deployment of entirely new images.

The VLi8 MT is ingeniously constructed. In minutes, with nothing more than your bare hands, you can open the unit's chassis and remove the motherboard, external drives, and even the internal drives. As mentioned, the system uses a separate PCI network

> card, but graphics and audio are integrated, allowing plenty of room for expansion. The HP smart-card reader (\$60) restricts system access to users with the appropriate card and PIN number.

With TopTools, you can inventory and monitor any Vectra from a remote console and also check it for chassis intrusions and update drivers, update many of the BIOS settings, flash the BIOS, restart it, power it down, and wake it back up. The inventory interface

is respectable and robust, displaying information on memory, CPU, network, and disk usage, and disk reliability. Like Compag's Insight Manager LC and Dell's IT Assistant, TopTools lets you perform limited inventory and monitoring with third-party systems; we were able to inventory every other system in our roundup save the IBM, but could pick up few third-party alerts. TopTools can also launch a limited version of the Insight Manager interface when accessing Deskpro systems.

HP received a grade of B on our most recent Service and Reliability Survey, and it provides good technical support via the Web .-- CM

# IBM PC 300PL

Pentium III/533B. 8MB Number Nine SR9 Extreme S3 Savage4 graphics. 13.5GB 7.200rpm hard disk, CD-ROM drive, 19-inch IBM monitor. Street price: \$2,400. Business Winstone 99: 32.8. Warranty: 3 years parts and labor, 3 years on-site service. Research Triangle Park, NC; 800-426-7255; www.ibm.com/pc/us.

The IBM PC 300PL platform offers several unique management applications, but it's generally less effective than the lines from Compag, Dell, and HP. IBM hasn't followed the trend toward PCs

that can be taken apart and put back together without a screwdriver, and the company's remote management tools do little with third-party machines. That said, if you decide to populate a small or medium-size network solely with machines from a single manufacturer, the 300PL is a reasonable option.

The line includes compatible minitower and desktop models but no smallform-factor system. You can use a single software image for both models, and IBM guarantees that certain configurations will remain available, without changes that could affect a software

image, for at least nine months.

Inside of the 300PL desktop we tested, most parts are screwed into place, including the motherboard, the drives, and the

PCI cards. Removing the drives or adding new ones is particularly difficult.

Though 300PL systems are now available with the fastest Coppermine

chips, this system includes a Pentium III/533B, which uses a 133-MHz bus and 512K of halfspeed L2 cache. Rather than using the Intel 810e chip set to provide such bus speeds, IBM has adopted a VIA Apollo chip set. With these parts, the system produced average scores on our benchmark tests.

Each 300PL is loaded with

IBM's Universal Management Services (UMS), which provides an unusual array of remote-inventory and remote-monitoring tools. The agent can be read from any Web browser on your network or from such enterprise management packages as IBM's Tivoli NetView and Computer Associate's Unicenter. If you want to manage third-party systems as well as IBM machines from a remote console, you'll have to load the UMS agent on those third-party systems or install a separate DMI package on the remote console. UMS uses the CIM standard (not DMI), which also prevents you from viewing the 300PL using such DMI

packages as Compag's Insight Manager. Dell's IT Assistant, and HP's TopTools.

Accessing the 300PL from a Tivoli NetView console at PC Magazine Labs. however, we were impressed with the data and tools provided. You can easily inventory the 300PL from the console, change its Windows settings, change its BIOS settings, back up its software image, power it down, and even gain control of its desktop remotely.

On top of all that, IBM's LANClient Control Manager will remotely load software images onto any 300PL, its Smart Reaction 2 package will automatically back up a system when its hard disk

> begins to fail, and its Asset ID EEPROM (with the help of a third-party hand-held radio frequency unit) lets you inventory and track systems when they're not on the network. IBM is also one of just two vendors that received a grade of A for desktops on our most recent Service and Reliability Survey.-CM



# NEC PowerMate ES 5250

Pentium III/600, 8MB ATI Rage XL graphics, 12.4GB 5,400-rpm hard disk, CD-ROM drive, 17-inch NEC monitor. Street price: \$2,120. Business Winstone: 30.6. Warranty: 3 years parts and labor, 1 year on-site service, Mountain View, CA: 888-632-8701; www.nec.com.

Of the three systems reviewed here that use Intel's LANDesk Client Manager for remote inventory and monitoring, the NEC PowerMate ES 5250 is the most impressive. Like the Systemax Mission PME-T600 and the Toshiba Equium 7100 D, the PowerMate ES uses the original Pentium III chip and LANDesk Client Manager 3.3, vet it benefits from a far superior chassis design. Notably, you can remove the minitower's motherboard in a matter of seconds and use it with any other system in the 5250 line, including desktop and "space-saving desktop" models. Overall, however, we found the offerings from Compag, Dell, and HP more compelling.

After laying off most of the employees at its California manufacturing facility as well as at its Packard Bell consumer PC division, NEC is a company in transition. As it decides which consumer

PCs should be folded into existing cor-

porate PC lines, the company isn't entirely sure about the future of the new 5250 line. The line will likely offer Coppermine, the Intel 820 chip set, and Version 6.0 of Intel LAN-Desk in the coming months. There are no guarantees, but the line should be available at least through the second quarter.

Even with its current hardware and desktop management software, the line is well suited for the large corporate LAN. Using the same motherboards-which integrate graphics, audio, and networking—as well as the same disk drives, all three models are

capable of handling the same software image. NEC will try to continue producing machines that support the software images used by today's 5250s.

The NEC motherboard of choice is an NLX model. With the mini-tower reviewed here-as with the desktop and space-saving machines-you can easily remove the motherboard and just as easily reinstall it. This does require a screwdriver, but once you remove a single screw from the panel at the foot of the chassis, you need only pull the panel open to release the motherboard. that holds the PCI cards in place

We didn't like the mechanism (its sharp edges wreak havoc on the fingers), but you can readily remove all external 5.25-inch drives without tools and without injury.

Like the Toshiba Equium 7100 D reviewed here, the PowerMate ES uses a 5,400-rpm hard disk and an ATI graphics chip. It performed below the roundup's leading machines on our Business Winstone, Disk WinMark, and-to a lesser extent-Graphics WinMark tests. The system is plenty fast, however, for most corporate applications, and it performed reasonably well on most of our i-Bench tests.

Running LANDesk on a remote console, you can receive a variety of health alerts from the PowerMate ES (chassis intrusion, temperature, voltage, fan, and SMART hard disk) and take thorough inventory. In particular, we like the way LANDesk lays out the various ways you can upgrade the system's memory-but this is true of any system running the LANDesk agent.

The NEC PowerMate ES 5250 is a capable but generic machine, a description that fits NEC's support policies as well. NEC received a grade of C on our most recent Service and Reliability Survey. -CM

# Windows 2000: The Managed OS

here's no avoiding it: A lot of IT time is spent upgrading software and fixing end-user mistakes. But things could get easier with Windows 2000. The new OS comes with everything an administrator needs to deploy software, manage remote users, and keep end-user

mistakes to a minimum. In fact, it is one of the most manageable OSs on the market; when combined with third-party tools, it can substantially reduce an administrator's workload.

Active Directory (AD) is the key to Windows 2000 and is designed to serve as a global directory. Unlike Windows NT domains, AD lets you manage both users and hardware, including printers. Every user, no matter where he or she is located, appears in one AD tree. This lets you manage remote users, set up access restrictions, and create Group Policies for all users from a single console. The Group Policy editor is a great tool, not only for controlling access rights but also for locking down the user desktop. For example, you can use policies to control which utilities users can access on their desktops, including the Control Panel applets as well as the

Find and Search functions. This is the next best thing to using a thin client on each desktop.

IntelliMirror is definitely the most exciting management feature of Windows 2000. In a nutshell, IntelliMirror lets you distribute software, manage user settings, and control user data. With software installation and management, users' applications follow them wherever they go. For example, you can create a software installation package or upgrade and send it out to a single user or group. When that user connects, the software is automatically installed. Likewise, if a user goes to a different PC

Windows 2000's Active Directory lets you manage PCs as well as users from one utility.

and logs on, all of his or her settings and applications will automatically appear on that desktop. Our favorite feature of IntelliMirror is the self-healing utility. If a user accidentally deletes a program file, such as an executable or DLL, IntelliMirror will download the missing file from the server and repair the application without any user intervention

The data management feature of IntelliMirror

works with a utility called Off-line Folders to let users take their data with them. This is important for mobile workers who need to work on company data. If a user makes changes to the data in the Off-line Folder, those changes are automatically synchronized with the host copy the next time the user connects to the network.—Steve Rigney

# SUMMARY OF FEATURES

See www.pcmag.com for interactive views

Corporate Ma	Compaq Deskpro		PC MAGAZINE EDITORS' CHOICE			Systemax	
■ YES □ NO	EN 667 Small Form Factor	Dell OptiPlex GX110	HP Vectra VLi8	IBM PC 300PL	NEC PowerMate ES 5250	Mission PME-T600	Toshiba Equium 7100 D
Price of tested configuration	\$2,350 street	\$2,546 direct	\$2,500 street	\$2,399 direct	\$2,120 street	\$1,969 direct	\$2,000 street
Processor	Pentium III/667B	Pentium III/733	Pentium III/650	Pentium III/533B	Pentium III/600	Pentium III/600	Pentium III/600
Motherboard manufacturer	Compaq	Dell	Hewlett- Packard	IBM	Micro Star	Intel	Toshiba
Chip set	Intel 810e	Intel 810e	Intel 440ZX	VIA Apollo Pro	International Intel 440BX	Intel 440BX	Intel 440BX
				133A			
BIOS CAMPAGNA MONGA A MONGA MANAGEMENT AND A	Compaq 686JL	Phoenix/Dell 4 Release 6.0	Phoenix 4 Release 6.0	IBM PMKT09AUS	Award V4.51	Phoenix 4 Release 6.0	Phoenix 4 Release 6.0
Installed/maximum RAM	128MB / 512MB	128MB / 512MB	128MB / 512MB	128MB / 512MB	128MB / 512MB	128MB / 768MB	128MB / 512MB
L2 cache	256K	256K	256K	512K	512K	512K	512K
Hard disk	Maxtor DiamondMax Plus 6800 91366U4	Maxtor DiamondMax Plus 6800 91366U4	Maxtor DiamondMax Plus 6800 92732U8	IBM Deskstar 22GXP DJNA- 372040	Maxtor Diamond Max VL 20 91303D6	Quantum Fireball KX	Western Digital Caviar 310200
Formatted capacity	13GB	13GB	27.3GB	19.5GB	12.4GB	19.6GB	9.8GB
Rotational speed (rpm) and interface	7,200 IDE	7,200 IDE	7,200 IDE	7,200 IDE	5,400 IDE	7,200 IDE	5,400 IDE
Hard disk controller supports ATA/UDMA 66							
Supports SMART protocol							
Graphics card model	Integrated on motherboard	Integrated on	Integrated on motherboard	Number Nine SR9	Integrated on motherboard	Visiontek Vanta 8	Integrated on motherboard
Crophics ship set	and some transfer of the same and the same and the	motherboard	HINDON CONTRACTOR STORES	Extreme	ATI Rage XL	al/idia PIN/A Manta	Address of the supplemental supplemental for the
Graphics chip set	Intel 810e Variable SGRAM	Intel 810e Variable SDRAM	Matrox G200 8MB SDRAM	S3 Savage 4 16MB SGRAM	8MB SDRAM	nVidia RIVA Vanta 16MB SGRAM	ATI Rage Pro Turbo 8MB SDRAM
Graphics memory Monitor	Compaq V700	Dell M770mm	HP D2838	IBM G96	NEC NCM-1720	AOC Spectrum	Toshiba TekBright
World	Compad v700	Den Wiffolian	HL D7020	IDIVI 030	INEC INCIVI-1720	7Glr	710V1
Tube size (diagonal, in inches)	17	17	17	19	17	17	17
Type of optical drive	CD-ROM	CD-RW	CD-RW	CD-ROM	CD-ROM	CD-RW	CD-ROM
Manufacturer and model	Goldstar CRN-8241B	Sony CRX100E	Sony CRX100E	Goldstar CRD-8400B	Lite-On LTN-382N	Mitsumi CR-4804TE	Lite-On LTN-382N
Read speed	24X	32X	32X	40X	40X	24X	40X
Other mass-storage device	Iomega Zip 100	None	None	None	None	None	None
Expansion-bus slots (32-bit PCI / ISA / shared)	1/1/1	5/0/0	2/2/1	3/0/0	3/1/1	3/1/1	2/0/1
Front-accessible drive bays (5.25" / 3.5")	1/1	3/1	3/1	2/1	3/1	3/2	2/1
Internal drive bays (5.25" / 3.5")	0/1	0/3	0/2	0/1	0/2	0/2	0/2
Power-supply wattage	120	200	120	145	200	200	200
Parallel/serial/USB ports	1/2/2	1/2/2	1/2/2	1/2/2	1/2/1	1/2/2	1/2/2
Tool-free chassis/drives							
Sound card	Integrated AC97	Creative Ensoniq AudioPCI	Cirrus Logic CrystalSound CS4280-CM	Integrated ESS 1930	Yahama XG	Creative CT4811	Cirrus Logic CrystalSound CS4235-KQ
10/100 network adapter	Intel 82559 Fast Ethernet	3Com Etherlink 3C905TX	3Com Etherlink 3C905TX	IBM Etherjet PCI	Intel 82559 Fast Ethernet	Kingston Tech- nology EtheRx VP	Intel EtherExpress Pro 100B PCI
Network port location	Motherboard	Motherboard	PCI	PCI	Motherboard	PCI	Motherboard
Keyboard manufacturer	Compaq	Dell	Hewlett-Packard	IBM	NEC	Microsoft	Toshiba
Mouse manufacturer	Compaq	Microsoft	Hewlett-Packard	IBM	Logitech	Microsoft	Logitech/Toshiba
Scroll function							
Primary desktop management package	Insight Manager LC	OpenManage IT Assistant	TopTools 4.5	Universal Management Services	LANDesk Client Manager 3.3	LANDesk Client Manager 3.3	LANDesk Client Manager 3.3
Remote inventory							
Remote chassis-intrusion alerts							
Remote fan/temperature/voltage monitoring							
Remote SMART alerts/hardware removal alerts							
Remote driver updates							
Remote BIOS flashing/BIOS setting updates							
Remote wake-up/reboot/power-down							
Remote chassis lock							
Limited management of third-party systems							
Remote OS/application deployment							
Remote disk format				ALL OF ALL OLD THE PROPERTY OF THE PARTY OF	The second second second second		
Live technical-support hours	24 hours, 7 days	24 hours, 7 days	24 hours, 7 days	24 hours, 7 days	24 hours, 7 days	24 hours, 7 days	24 hours, 7 days
Standard warranty on parts/labor	3 years/3 years	3 years/3 years	3 years/1 year	3 years/3 years	3 years/3 years	3 years/3 years	3 years/1 year
On-site service charge for 1 year	Included	Included	Included	Included	Included	Included	Included

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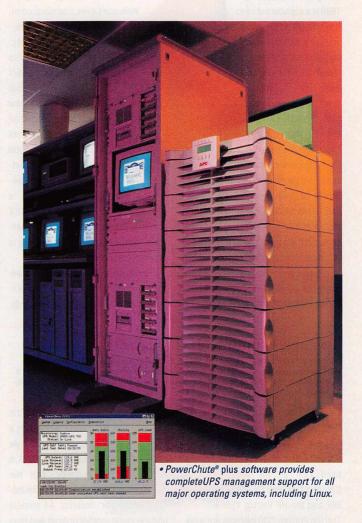
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# Systemax Mission PME-T600

Pentium III/600, 16MB nVidia Vanta graphics, 19.6GB 7,200-rpm hard disk, CD-RW drive, 17-inch AOC monitor. Direct price: \$1,969. Business Winstone 99: 35.8. Warranty for CPU and memory: 5 years parts, 5 years labor; for other parts: 3 years parts, 1 year on-site service. Port Washington, NY; 800-728-8589; www.systemaxpc.com.

Using Intel's LANDesk Client Manager 3.3 and a traditional mini-tower chassis,

the Systemax Mission PME-T600 is a capable but modest managed PC. Though you can adequately inventory and monitor the system from a remote console, it fails to support many of the tools available through LANDesk Client Manager 6.0. Though you can easily open the system without tools, you need a screwdriver to remove drives or add-in cards. The PME-T600 is comparable to the NEC and Toshiba systems reviewed here, but it is a step behind the managed PCs from Compag, Dell, HP, and IBM.

Systemax is the brand name now being used by MidWest Micro, a wellknown mail-order vendor. The Mission

series of managed PCs, including the PME-T600, is available through the

MidWest Micro catalog, through its Web site (www.mwmicro.com), from its sister companies, dartek.com and Tiger-Direct.com, and also from its parent company, Global Direct Mail (www .globalcomputer .com). These systems do not use the Intel Celeron CPU or the costsaving 810e chip set: lowend, \$999 models use a Pentium/450 CPU and the 440BX chip set. The series also lacks a smallform-factor machine, but the line is otherwise complete.

Because the line's desktop and minitower models can use the same motherboards, hard disks, and add-in cards, you can easily deploy one software image across multiple Mission PCs. You can even use the same image while varying the level of graphics technology: The line includes several different nVidia-based graphics cards, but they all rely on the same driver.

The PME-T600 is well equipped but lacks the flexible case design popularized by the market's leading vendors. Most internal hardware is screwed into place, making repairs more time-consuming. Relying on four add-in cards (NIC, graphics, audio, and hard disk controller), the system lets you easily swap components with other Mission systems but has only one free PCI slot. There's ample room for additional drives, but loose cabling could complicate upgrades.

As with all of the LANDesk systems

reviewed here, we were impressed with how easily and how thoroughly we were able to inventory the PME-T600 from a remote console. The system can't detect chassis intrusions—a disappointment given the unlockable chassis—but its LANDesk 3.3 solution is average. You can remotely monitor voltages, temperatures, and CPU fan speeds.

The PME-T600 was an average performer on the benchmark tests it completed. It failed to complete our ZD High-End Winstone, ZD High-End Disk WinMark tests, and Content Creation Winstone tests.

The Systemax Mission PME-T600 benefits from an extensive warranty for the CPU and memory. Available at least through February and probably through the first half of the year, this inex-

> pensive machine is worth a look for companies on a budget, though we prefer models from the market leaders.—CM



Toshiba Equium 7100 Desktop

Pentium III/600, 8MB ATI graphics, 9.8GB 5,400-rpm hard disk, CD-ROM drive, 17inch Toshiba monitor. Street Price: \$2,000. Business Winstone 99: 30.5. Warranty: 3 years parts, 1 year labor, 1 year on-site service. Irvine, CA; 800-867-4422; www.toshi-

The Toshiba Equium 7100 Desktop falls just short of matching the convenience of such managed PCs as the Compag Deskpro EN 667 and the HP Vectra VLi8 MT.

Toshiba Equium 7100 systems are available in three different case designs and with several different CPUs, and you can swap parts between models, but the physical layout of these PCs is a hindrance. And still using Intel's LANDesk Client Manager 3.3 rather than the Version 6.0 update, the Equium 7100 D is an average managed PC that hasn't yet reached its full potential.

The Equium 7100 line uses various versions of the Pentium III, the low-cost Celeron, and also the Pentium II. (For customers needing nothing but low-cost machines, Toshiba offers its Celeronbased 7300 line.) The 7100 offers three

different models: the 7100 D, which uses a classic desktop-style chassis: the 7100 M. a mini-tower; and the 7100 S, a small-form-factor desktop. All models

use the same motherboards and thus the same graphics, audio, and network chips, letting you standardize a single software image.

Yet with Toshiba's Configuration Builder CD-included with all 7100 systems-you can just as easily create a new software image for each machine on the fly, with just a few mouse clicks to choose drivers, various Toshiba applications, and an operating system. The next version of Configuration Builder will support third-party applications as well.

The Equium 7100 D is not as easy to service as it seems. In theory, you

should be able to open its chassis easily, remove its motherboard, and swap drives in and out of its front bays—all without the tools. Though all of these tasks can indeed be completed without the help of tools, none can be completed without great difficulty. The motherboard, for example, is on rails and can be removed by pulling a lever, but this act requires some serious elbow grease. Getting the board back in is even more difficult; it doesn't slide straight on its rails, so you have to angle it to the left to reseat it. which bends the case's back panel.

The Equium 7100 D uses a comparatively slow hard disk (5,400 rpm) and lacks speakers, but its hardware is otherwise satisfactory. There's some room for expansion (one 5.25-inch drive bay, one 3.5-inch drive bay, and three PCI slots), and motherboard ASICs let LANDesk Client Manager identify chassis intrusions, fan failures, imminent hard disk failures, and abnormal tempera-

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tures remotely.

Clear

Additional management features should be available when Toshiba migrates to LANDesk Client Manager 6.0 (sometime in the second quarter of this year). Around this time, Toshiba will also offer Coppermine systems and may move to the Intel 820 chip set. In the meantime, all current Toshiba Equium 7100 models will be available with few, if any, changes.

Toshiba received a grade of C on our most recent Service and Reliability Survey, and the company offers extensive technical support over its Web site. The 7100 line has its benefits, but it still needs improving.—CM



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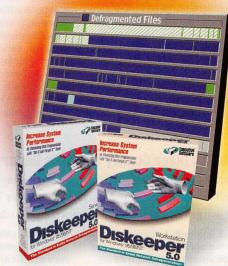
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#### MANAGING ENTERPRISE:

The management applications that ship with the corporate PCs we tested are great for managing an office full of client PCs. But if you need to manage an entire enterprise, with mainframes, midrange computers, PC servers, and PCs with disparate OSs, then you need a more robust solu-

tion, such as IBM's Tivoli Enterprise and Unicenter TNG from Computer Associates International (CAI). Here are three case studies. By Michael Hurwicz

Memorial Sloan-Kettering Cancer Center (MSKCC) is an example of an organization that has made standardization of client

PCs work. In addition to all the usual office-automation applica-

tions, MSKCC uses PCs for mission-critical tasks. For instance,

doctors typically use PCs to view medical records as well as the results of x-rays, blood tests, and other lab work-all of which is stored on central servers. It would

be overly dramatic to say that lives depend

on the PCs working properly, but it's fair to say that these are pressing tasks and busy people, and the last thing anyone wants is a delay due to a malfunctioning PC.

Seeing to the health of 5,000 PCs in 25

locations in New York and New Jersey is no small job. It was worse in 1998 than it is today. Back then, the desktops were predominantly running Microsoft Windows 95. They weren't tightly standardized. On a typical day, a department with 300 workstations generated about a dozen support calls. Although there were support technicians at every site to answer those calls immediately, that meant a dozen interruptions—a dozen delays. To reduce those

delays MSKCC employs the inventory and software-distribution features of Microsoft Systems Management Server (SMS), the lockdown and permission features embodied in Microsoft Windows NT 4.0's policies and profiles, and MSKCC's proprietary compliance-checking utilities.

MSKCC's first step was to design an SMS-based system to implement automated software distribution as well as hardware and software inventory. This gave IT

Alliance Funding has a more heterogeneous computer environment than MSKCC, for which it chose a more heterogeneous management tool: Tivoli Enterprise. However, Alliance's approach to lockdown and standardization is similar to MSKCC's.

Alliance is a subprime mortgage lender: It makes loans to buyers whose credit isn't good enough to satisfy other lenders. They have mission-critical applications running on AS/400s, as well as Unix machines from Sun Microsystems and IBM. The company's flow of revenue also depends heavily on 1,700 IBM PCs spread throughout Alliance's offices in Chicago; Miami; San Jose, California; Orangeburg, New York; and elsewhere. To keep track of its PCs and how they're equipped and configured, Alliance uses the NetCensus Enterprise PlusPack, a PC inventory program from Tally Systems Corp. Alliance has also completed the first phase of installing IBM's Tivoli Enterprise management suite,

putting Tivoli's software-distribution application into production. Finally, Alliance uses native Windows NT capabilities to lock down NT 4.0 desktops.

Alliance started using NetCensus in late 1998. As part of a Y2K-readiness program, the company was beginning the process of converting its desktops from OS/2 and Windows 95 to Windows NT 4.0. It needed a quick way to determine the hardware and software configurations of all its machines to see whether transferring everything to Windows NT or finding Windows NT-compatible equivalents would be possible. The path to NetCensus was full of pitfalls and deadlines. In late 1998, Alliance started looking for a PC

inventory package that could handle OS/2, Windows 95, and Windows NT desktops, as well as Windows NT and NetWare servers. The company was already well under way with installing Tivoli Enterprise, which does have a sophisticated inventory module, Tivoli Inventory. Tivoli Enterprise, howev-

installation of applications on Windows NT and getting the rollout done on schedule. The company also wanted to implement Tivoli's Remote Control application, a critical component that would let the company troubleshoot and reconfigure desktop machines from a central location.

"We rushed through the installation of Tivoli," notes Michael Daversa, enterprise management administrator. The sophisticated product did not take kindly to being rushed.

er, is a very complex, interconnected product line, and installing and configuring the inventory module would be a lengthy process. That would delay installing the Tivoli software-distribution application. which was the key to automating the

That was critical, because Alliance does not have technical people at every location, and the Windows NT rollout was bound to mean a temporary flood of technical-support calls.

The time frame for doing the Windows

# The San Diego County Sheriff's Department is in the process of implementing enterprise-level management for desktops based on Computer Associate's Unicenter TNG. Ultimately, this will prevent users from making changes to desktops and will

include functionality summarized under the term "managed PCs." ("Lockdown" has a completely different meaning in the Sheriff's Department.)

One major inspiration for enterpriselevel management is the increasing size, criticality, and technical complexity of the PC-based solutions the department is implementing. In particular, several years ago the department began planning for the Jail Information Management System (JIMS), a \$20 million project to automate every aspect of detention facilities, from booking to releasing and everything in between: classification of inmates, medical care, special dietary needs, counseling, and identification of inmates through fingerprints, digital photos, and bar codes on wristbands.

The system will use seven Oracle

servers and add 450 new desktop PCs to the 1,000 clients currently installed at about 50 sites. Most of the PCs run. Windows NT, but a few still run Windows 95. There are also 45 Windows NT servers (42 are Intel-based, 3 are Alpha-based), 500 Windows 98-equipped laptops in police cars, and 400 other laptops running Windows 95.

"We realized that once we got JIMS in there, we couldn't be reactive anymore," says Richard Palmer, manager of the department's Data Services division. "Before we got Unicenter, we had a PC go down in the budget group one morning, and it took us all day to figure out that it

was a repeater and to get it changed. The PC wasn't back up till four or five that afternoon. We couldn't continue doing business like that."

The Sheriff's Department considered three products: HP OpenView, Tivoli Enterprise, and Unicenter.

"We determined that OpenView is good in networks but doesn't rank for PCs or servers," says Palmer. "So it was down to Tivoli and Unicenter. Looking at that, we saw that Tivoli was really more appropriate for the IBM environment. We were strictly DEC."

The Sheriff's Department had several Digital Equipment Corp. VAXs running VMS

# Corporate Managed PCs

personnel up-to-date information and a mechanism for installing or updating software efficiently. The next phase was to implement the SMS architecture and add standardization and lockdown, MSKCC defined a single desktop reference platform to which all desktops should conform in both hardware and software (specifically, all desktop machines would run Windows NT 4.0 with Service Pack 4). The applications that were installed on the machines are all the same, too, including proprietary clinical and medical applications and off-the-shelf office-automation applications such as word processing and e-mail programs, schedulers, and Web browsers. As with software, the hardware configurations of all the clients are identical. In addition, using log-on scripts and the policy and profile capabilities of Windows NT, MSKCC ensures that only the central support group can make a hardware or software change to a desktop machine.

"They see nothing on the Windows

desktop except the Memorial Sloan-Kettering logo and a Start menu with all the applications they require to do their work," says Rachel Heftler, MSKCC's senior manager of information systems. "They don't see applications they don't need. There's no Network Neighborhood, no My

addition to the central primary SMS server. there are seven secondary SMS servers, each handling a particular geographical region. The inventory information from the secondary servers is combined in a SQL Server database on the primary server. In addition, every morning at 4:00 A.M.,

"They see nothing on Windows desktop except the Memorial Sloan-Kettering logo and a Start menu with all the applications they require to do their work," says Rachel Heftler, MSKCC's senior manager of information systems.

Computer, no Run command,"

Once a week, using services and scripts from Strategies, a desktop management company based in Ryebrook, New York, MSKCC does a software and hardware inventory of all machines using SMS. In

MSKCC does software distribution and compliance checking for all machines, using a utility called NT Express. This utility uses Compaq's Wake-on-LAN capability to wake up all PCs. SMS then does the software distribution. Finally, NT Express does a

compliance check, in case an administrator has inadvertently changed something in a configuration or a program has terminated abnormally. IT gets a report from NT Express every morning and addresses the problems by retargeting the workstations with automated distribution scripts.

For nonautomated Windows NT management tasks, MSKCC may use Enterprise Administrator, from Mission Critical Software, a rules-based administrative suite for Windows NT that supports administration of directory objects (such as users and groups) and extra-directory objects (computers, printers and shares.

MSKCC has seen dramatic results in the areas where the new system has been implemented, says help desk manager Jim Vetrano. One 300-person workgroup that use to generate 12 support calls a day now generates less than 5. Even better, a new 600-workstation outpatient clinic that has been using the system since its inception generates only 4 calls per day on average.

NT rollout was already tight: Alliance had 13 locations to upgrade. Technicians had to do most of the actual work on weekends. And there were only so many weekends before the year 2000. Implementing the Tivoli inventory application would have put Alliance behind schedule. So the company needed a quick, easy, and inexpensive way to inventory systems.

Enter NetCensus. With a quantity discount, NetCensus cost only about \$16.50 per PC. The installation was straightforward, says John Puig, Alliance's vice president of information systems and technology. A technician from Tally Systems helped set up product libraries and build the Collector utilities that gather information from client systems. It took a total of about two weeks to install the software at 13 locations, with an average of three servers per location. Once it was installed. NetCensus took only minutes to inventory each machine as each user

logged on. The inventory was complete within a few days of finishing the software installation, keeping the Windows NT rollout on schedule. The Tivoli installation, meanwhile, was not going so well. The company initially purchased Tivoli Enterprise 3.12 and, with Y2K breathing down its neck, set about installing the product as quickly as possible.

"We rushed through the installation of Tivoli," notes Michael Daversa, enterprise management administrator at Alliance, who was in charge of the installation.

The sophisticated product did not take kindly to being rushed, and before the company got Tivoli Enterprise 3.12 fully functional, Tivoli Enterprise 3.6 became available. The new version represented a significant architectural enhancement, notes Daversa, especially when it came to desktop management, including software distribution. The previous product had a two-tier architecture, in which the Tivoli

Management Server communicated directly with each desktop agent. Tivoli 3.6 has a three-tier architecture, with the Tivoli Management Server on top, managed gateways in the middle, and end points on the bottom.

Alliance configured just one managed gateway at each location. All the other PCs were configured as end points, using the Tivoli Lightweight Client Framework (LCF). For software distribution, the managed gateways act as "multiple distribution repeaters." That means that the Tivoli Management Server downloads one copy of the software to the managed gateway, and the managed node provides it to the end points as needed. This is a huge savings in bandwidth over the two-tier architecture, in which the Tivoli Management Server did a separate download to each desktop. Bandwidth, however, was not a huge consideration for Alliance's Windows NT rollout, since installation was

being done during off-peak hours. What was important, given the time pressure, was that the software distribution process should go dramatically faster.

Once software was distributed to a machine, Alliance created a Windows NT profile for each user, which determines what the user will see on the desktop and what permissions the user will have at logon. Users do not see applications they don't need. In addition, they cannot change the machine's configuration or install new software. "Locking down" machines in this way prevents a host of support problems.

Looking to the future, Alliance's enterprise desktop management strategy is definitely Tivoli-based. One of Tivoli's strengths is integrating with third party software. Tally Systems sells (for about \$3000) an integration module that would allow Alliance to continue using NetCensus and manage it through the Tivoli interface.

and managed under Digital's PolyCenter. Even though the VAXs were going to be phased out in favor of Windows NT servers, for the moment they remained important. Then CAI acquired PolyCenter from Digital and integrated it tightly with Unicenter. The Sheriff's Department already had the PolyCenter software and the in-house expertise to run it. That was the deciding factor.

JIMS is still well over a year away from deployment, and the managed PC initiative has not begun yet. The Sheriff's Department has already realized significant benefits from Unicenter, however. For instance, when the department was

preparing to upgrade network PCs to Windows NT as part of its Y2K preparation at the beginning of the JIMS project, the department had to perform an inventory of all the PCs to determine

which ones needed to be upgraded.

"Unicenter did 95 percent of the job for us," says Adrian Ortiz, leader of Desktop Unicenter implementation.

Although Palmer warns prospective

"We had a PC go down in the budget group one morning. The PC wasn't back up till four or five that afternoon. We couldn't continue doing business like that," says Richard Palmer, manager of the Data Services division.

Unicenter users not to underestimate the effort required to install it or the difficult technical and cultural learning curves (reminiscent of Alliance Funding's early experiences with Tivoli), he says the Sheriff's Department is looking at expanding its Unicenter deployment into new areas such as ATM and frame-relay management, virus scanning, single signon, and application response time monitoring.

"My goal is to make Unicenter the thing we depend on, both operationally and in the culture of our division," says Palmer. He thinks that may take until about the middle of 2001.

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the differences between CD-**ROMs** and other flavors of optical disks. Page 124



# Share

one computer among multiple users who can all have their own settings.

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Activate your desktop with Internet content using channels. Page 126

# Restore Minimize Maximize 6Nov99 🐴 🎉 Close

## Clear

space on your taskbar by minimizing apps to the tray. Page 141

# HARDIJJARF

Compatibility among CD varieties is the goal of hardware vendors.

# INTERNET 126

Internet Explorer 5's channels keep your Web experience up to date.

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# DESKTOP 135

Windows' Multiple User Profiles let several users feel at home on the same PC.

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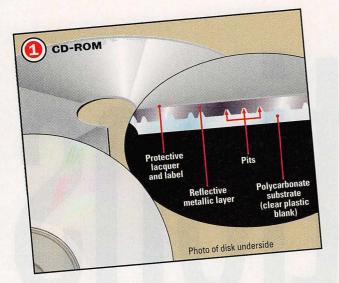
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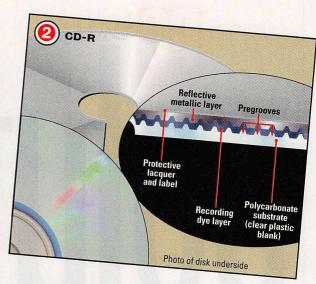
TrayMin lets you minimize programs to the system tray-even if they weren't designed to do so.

You'll find all of the articles, examples, and code files in this section at Solutions online.

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# hardware SOLUTIONS





- 1.The underside of a standard CD or CD-ROM disk appears silver or gold, because the metallic reflective layer is placed directly against the clear plastic base, which has been molded with pits and smooth areas (lands) to record the data.
- 2. CD-R disks need an extra layer of dye to record data, so the underside often has a tint. Sometimes the dye appears to be colorless, so you may not see any color besides the silver or gold reflective coating. When a disk has been recorded on, you can see a darker band where the data has been written. CD-Rs have preformed spiral tracks that guide the recording laser.
- 3. Instead of using dye to record data, CD-RW uses a compound that can switch between crystalline and amorphous phases. CD-RW disks add dielectric layers on either side of the recording layer to draw excess heat from the phase-change layer during the writing. CD-RW disks also have preformed grooves to guide the writing laser

# **Optical-Drive Compatibility**

Why some flavors of CD and DVD drives and their media are compatible and why some aren't.—By Alfred Poor

Ichemists searched for the "universal solvent"-a substance that would dissolve everything else. The goal of modern computer alchemists is a "universal drive"one that will read any optical disk format, from audio cds to dvd-ram disks. Though this goal may be more realistic, there remain significant obstacles. As a result, some combinations of disks and drives will work together but others won't. In order to understand which combinations work together, you need to know a bit about the technology of the different disk formats.

#### **HOW DATA IS RECORDED**

On a CD or CD-ROM, information is mechanically recorded. A master disk is created with a spiral track of pits and smooth stretches that carry the encoded data, and this is then stamped onto the surface of a blank plastic disk. The surface is then covered with a thin aluminum coating—giving the disk its characteristic silver color—and the reflective layer is then covered with a thin layer of lacquer. The disk label information is then printed on top of the lacquer. Note that this makes the top, label side of a CD more susceptible to permanent damage than the bottom.

A CD-ROM drive reads the data by shining a laser beam onto the surface of the reflective layer. The light reflects back when it hits a smooth area but is diffused somewhat when it strikes a pit. By sensing the amount of reflected light, the drive can interpret the patterns of pits, which are then decoded as bits of data.

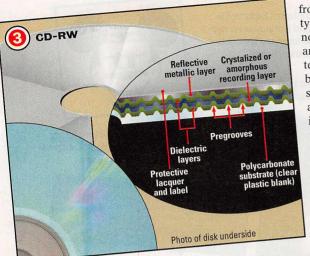
CD-R disks use a different method to record

data. In order to let users record their own data, the disk must be assembled in a way that leaves it blank at the start. There is a reflective layer on top and a clear plastic layer below, but in between there is a thin coating of light-sensitive dye. When a stronger laser beam is focused on this layer it changes color, which in turn changes the reflectivity of the spot. When illuminated with a standard CD-ROM laser—which operates at a lower power than the CD-R write laser—the discolored spots reflect less light, and this lets the drive detect the recorded data.

The process that changes the color of the dye layer is irreversible, which is why you can only write to an area of a CD-R disk once. (It is possible to write to a CD-R more than once, but you must write in a new area of the disk each time.) Also, the dye layer remains sensitive to light; if you leave a CD-R out in full sunlight, you risk losing data.

The third type of compact disk is CD-RW, which supports read, write, and erase operations. As a result, you can use it in much the same way as a magnetic media device—such as a hard disk—to add and delete files as you wish. This means that the changes have to be reversible, requiring a design different from CD-R disks.

The solution is a thin layer with reflective properties that can be altered. By heating this layer with a laser beam at moderate power, called write power, the material cools to form crystals; when heated with a stronger beam, at erase power, the material forms an amorphous layer. The crystalline form reflects more light



than the amorphous layer, enabling the drive to read the data. For reading back data from a CD-RW disk the drive uses a read power laser beam, which is weaker than either the write or erase beams.

#### SHADES OF GRAY

These three technologies all rely on the relative difference between reflective and nonreflective—or more accurately, less reflective—spots on the disk's data layer. The problem is that the difference between reflective and nonreflective is not the same for each of the three designs. The smooth parts of a CD reflect much more light than the pits. The unexposed parts of a CD-R reflect more light than the discolored spots, but there's not as much difference between the two levels of reflectivity as there is with a CD. And the differences in reflectivity between the crystalline and amorphous spots on a CD-RW disk are smaller still. As a result, the read-head technology that works for a compact disk-a CD-ROM or audio CD-may not be sensitive enough to read a CD-R or CD-RW disk.

The problem is compounded when you try to read a disk on a DVD-ROM drive. DVD disks have far greater capacities than CDs do: 4.7GB compared with 650MB. In order to fit this much more data on the same size disk, more data must be written in a given space, which requires that the tracks be narrower. The dimensions are so small that the wavelength (and therefore, the color) of the light produced by the laser becomes a factor, and DVD drives must use a different type of laser than CD-ROM drives do. CD drives use lasers with wavelengths ranging from 775 nm to 795 nm (nanometers, or billionths of a meter). DVD drives use 650-nm lasers.

This difference has an enormous effect on the ability of a DVD drive to read data from disks designed for CD drives, especially in the case of CD-R and CD-RW, where the different color light

from the laser can affect the drive's ability to distinguish between reflective and nonreflective spots on the disk. As an analogy, if you look through a green filter at four sheets of paper—red, green, black, and white-the red and black sheets will look the same, and the green and white sheets will look the same. But if you look at the same four sheets through a red filter, the red sheet will look like the white one, and the green sheet like the black one.

# "THAT'S A HARDWARE PROBLEM"

The problems of read-head sensitivity to light levels and different colors are physical, and cannot be solved with a firmware upgrade. Fortunate-

ly, newer drives of all varieties have addressed these issues.

For example, DVD drives now have dual-laser read heads designed for both CD and DVD media. But that's only part of the solution.

Stepping in to help solve the problem, the Optical Storage Technology Association (OSTA) developed a new specification covering the read characteristics for CD and DVD drives. The MultiRead specification was established in 1997 to help drive makers design drives to be compatible with a wide range of media.

In order to comply with the MultiRead specification, a drive must be able to read all of the following disk types: audio CD, CD-ROM, CD-R, and CD-RW. This includes working with the different levels of reflectivity on the different media. The OSTA specification covers CD-ROM, CD-R, CD-RW, and DVD-ROM drives. The majority of new drives are MultiRead-compatible. According to some sources, nearly all 24X CD-ROM drives and all 32X CD-ROM drives comply with the MultiRead specification.

There are other factors involved in compatibility between different drives and different types of media, including the quality of the media themselves. In 1997 and 1998, OSTA undertook a study to test the compatibility of CD-R media with DVD-ROM drives. The study showed that although the majority of the combinations worked well, there were some brands of disks that performed poorly on some drives.

You should be able to use blank media from any source in your CD-R or CD-RW drive, but if you encounter read problems when using these disks on other drives, you may want to try a better-quality blank to see if that makes a difference. You might also contact the drive manufacturer to see what specific brands it recommends for use with its drives.

Alfred Poor is a contributing editor of PC

# **Curling Problems**

One of our printers tends to misfeed paper and jam. This doesn't happen all the time, and rarely when we open a fresh package of paper. What can we do to prevent this from happening?

> Virginia Gibson, Manchester, New Hampshire

The most likely cause of your problems is humidity. Paper thickness and weight can have an impact on reliability in printers, but moisture content is also important. If the paper is too moist or too dry, it can misfeed.

When a ream of paper is left open for a long period of time, its moisture content can change. If it takes you a week or more to use up a ream, then try to store the paper in a way that stabilizes the moisture content. A large, locking plastic bag or a plastic box with a lid that seals tightly may be all you need.-AP

# Floppy Disk Life Expectancy

How long can a floppy disk be expected to retain information? We have a lot of files backed up on floppy disks that are a few years old or even older. When we need to read from these disks, we find that maybe 20 percent of them are no good. If we run ScanDisk, it can't even read them.

> Brian Leighton via the Web

According to manufacturers, floppy disk media should last "a lifetime." This presupposes that the disks are not exposed to extremes of temperature or humidity. Your data may still be on the disks, even though you are unable to read them.

You are most likely reading the disks on a different floppy disk drive than the one on which they were written. Differences in head alignments can affect whether disks can be read on different drives. Also, if they are single- or double-density disks and you're trying to read them on a highdensity drive, the drive head may not be able to sense the magnetic fields reliably; try to find a drive of the same specifications and see if the disk can be read using that .- AP

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# USER

# Different (Key)Strokes for Reaching Web Pages

Whether you connect to the Internet via dial-up or a network, if you don't want to launch a browser every time you access a Web page, three quick Windows features provide alternate routes.

One option is to double-click on the My Computer icon on the Windows desktop. Just below the icon menu bar, on the line labeled *Address*, type in the desired URL (you can skip the *http://* part). Windows will automatically turn the Windows Explorer window into an Internet Explorer window and load the entered page, assuming you're connected to the Internet. If you use a dial up connection you'll still need to sign on, but at least you'll save the step of launching your browser.

You can also select *Run* from the Windows Desktop Start menu and type in a URL (this time with the *http://*).

In Windows 98, you can reconfigure the standard Windows taskbar to include an *Address* bar (right-click on the taskbar, click *Toolbars*, select *Address*). Although these aren't huge timesavers, each offers alternative routes to the Web pages.—*BB* 

# Multiple Start Pages for Internet Explorer

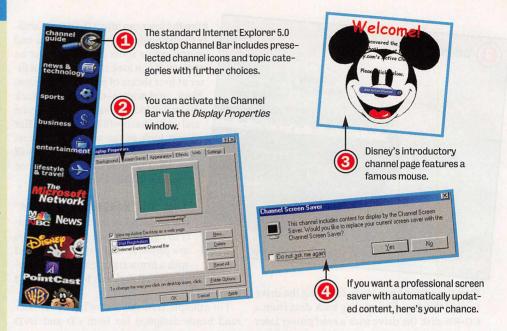
Is it possible to create several shortcuts to Microsoft Internet Explorer 5 on my desktop, each with a different start page?

Bert Kerkhofs

Maastricht, Netherlands

You can definitely do that. Start by navigating to one of the pages for which you want a desktop shortcut. In the Address toolbar, you'll see the URL of that page with a little icon to its left. (If you don't see the Address toolbar, choose Toolbars from the View menu and put a check next to Address bar). Drag the icon from the Address toolbar to the desktop. If you find that the page's title is too verbose for a desktop icon title, slowly click the title twice to enter editing mode. Type the icon title you want and press Enter.

Repeat this process for each of your alternate start pages. Now you can click any one of the desktop icons to launch your browser starting at the desired page.—Neil J. Rubenking



# **Internet Explorer's Channels**

Easy desktop access to fast-changing information that matters to you.—*By Marge and Bruce Brown* 

ooking for lively and informative Web content? There are tools in Microsoft Internet Explorer 5.0 that give you quick access to your favorite sites, bring selected Web content directly to your desktop, and make offline viewing more efficient. Internet Explorer 4.0's Web Channels and Web Site Subscriptions, which make all this possible, have been combined in IE 5 to lessen confusion and expand functionality.

An Internet channel is really just a Web site, but most often it's a Web site with changing content—such as news, sports, weather, finance, and entertainment—that you choose to view regularly. There are several ways to use a channel. You can add a channel icon to the desktop Channel Bar (Figure 1), use the channel as a screen saver (if supported by the Web site), select it as an Active Desktop window for continuous display of changes as they occur, or select downloading for offline viewing.

Although you can configure any Web site to be used as a channel, you'll find the richest experience with sites designed specifically for this purpose. Such sites are more likely to support the screen-saver function, have Active Desktop components to fit the latest information in a small window, and are frequently updated. It takes a few minutes to select and configure channels, but a small investment in time up front pays off in convenient on going information access.

# SETTING UP CHANNELS

If a Channel Bar doesn't show on your desktop and you are running Internet Explorer 4.0 or later, right-click on the Windows desktop, choose *Properties*, click on the *Web* tab, check the *View my Active Desktop as a web page* box, check *Internet Explorer Channel Bar*, and click on *Apply* (see Figure 2).

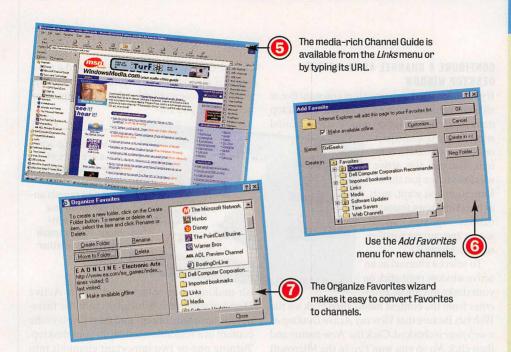
A good first step in using channels is to experiment with Microsoft's preconfigured selections on the desktop Channel Bar. The first time you select a given channel, an introductory screen displays the type of content and style you should expect from the channel (Figure 3). You are also presented with a choice to add the channel to your Active Desktop.

# **ACTIVATING A CHANNEL FROM THE CHANNEL BAR**

When you choose to activate a channel, you next decide whether to have its content available while you're offline. If you do want offline Web page storage, think carefully before choosing to have linked pages stored as well—extra pages can quickly use up hard disk space.

Next select the synchronization schedule you prefer, choosing from manually synchronizing via the Internet Explorer *Tools* menu, creating your own preferred schedule, or accepting the default schedule for the specific channel.

The final step in the channel setup process is to choose whether to use the channel as a



desktop screen saver (Figure 4). As mentioned previously, not all channels are able to support this feature.

Once you've activated the preselected channels you want to keep from the Channel Bar, it's a good idea to delete those you don't want. This will ensure that you'll have more room for your own selections.

## **ADDING CHANNELS**

There are two primary sources of channels. The Microsoft Channel Guide (Figure 5) has hundreds of preselected sites, often with multimedia content. You can also add any active Web site from your Internet Explorer Favorites to your channel list.

To access the Microsoft Channel Guide, click on it from the Internet Explorer Links menu. If the Links toolbar isn't displayed, click View Toolbars | Links to toggle the Links menu heading. On the Links toolbar, click Channel Guide. You can also access the Channel Guide by entering http://windowsmedia.microsoft .com in the Internet Explorer address bar.

With the Channel Guide in view, you can peruse current headlines and select the sites that generated them as channels, or you can search the category listings. With a few clicks, you can choose from sites that feature live surgery, live NASA video feeds, rowing clubs, financial news, entertainment reports, and even Web cams placed in interesting locations around the world. When you find a site you want to add to your channel selections, right-click on the Web page and select Add to Favorites. When the Add Favorite window pops up (Figure 6), click the Create In button if the Create In window

isn't open, and then click the Channels folder on the displayed menu. When you click OK, the channel has been added.

# ADDING A CHANNEL TO THE CHANNEL BAR

After you've added a new channel to your list, you can access it by pressing the Favorites toolbar button in Internet Explorer to open a frame on the left side of the screen. Your new channel should appear in the channel folder. To add a new channel to the desktop Channel Bar, click and drag the channel icon to the bar, positioning it where you want it. You can scroll the Channel Bar to reveal icons that don't fit, but keeping your most commonly accessed channels in view is most convenient.

# CONVERTING A WEB SITE FAVORITE TO A CHANNEL

If you have Web sites listed as Favorites that you access often for content updates, those are good candidates to convert to Channels. Elevating a Web site Favorite to a Channel is easy, but in doing so, you'll remove it from your Favorites list. You'll have to access the site via the Channel menu or else reassign it as a Favorite.

To designate a Favorite Web site as a Channel, click on the Favorites menu item on the top line of the Internet Explorer screen (not the Favorites icon on the Standard Buttons toolbar). Select Organize Favorites (Figure 7). Then select the desired Favorite site, click on Move to Folder, and finally, click on the Channels folder. At that point, the Web site will no longer be on your Favorites list but will be among the listed channels.

# **Restore IE5's Default Appearance**

I downloaded IE5 from ZDNet, and I'm very upset about what happened to my computer! I lost my server's home page and got yours. This is not what I wanted. Please tell me how to restore my system.

> Ronald Corbin via the Internet

USER

Most download sites brand IE5 with their own logos, title bars, home pages. and links, but you can easily remove the branding. Navigate to the page that you want for your home page. Select Internet Options from the Tools menu, click on the General tab, and click the button titled Use Current in the Home page panel. Now choose Organize Favorites from the Favorites menu and delete any unwanted links.

Two Registry values define the spinning logo. Launch Regedit or use PC Magazine's free RegEdit+ utility to navigate to the key HKEY CURRENT USER\ Software\Microsoft\Internet Explorer\Toolbar, and find the values BrandBitmap and SmBrand-Bitmap in the right-hand pane. Rightclick on each, choose Rename, and prefix the value name with an X (e.g., XBrandBitmap). Now navigate to HKEY\_LOCAL MACHINE\Software\ Microsoft\Internet Explorer\ Main, and double-click the value Window Title. Change it to whatever vou wish.-NJR

# **E-Mail Server Timeouts**

When there's a problem with my Internet connection and I check for mail, Microsoft Outlook 98 seems to take forever to stop trying to connect to the server. Can this duration be set?

> Kendra Watson via the Internet

All e-mail programs suffer this problem, not just Outlook 98. But all recent ones also provide a way to reduce the amount of time spent trying to connect or retain an existing connection with the ISP's mail server (which is where your mail is stored until you download it). Outlook and Outlook Express call this a server timeout (terminology differs among programs), and you can adjust the timeout duration through the Properties dialog of each specific mail account. In either program, go to *Tools* | *Accounts*, double-click on the specific account, and click the *Advanced* tab. Adjust the server time-out duration to the length of time you want; the default setting is 1 minute and the lowest is 30 seconds. Now, if something goes wrong with the server connection when you check your mail, you'll regain control over the e-mail program more quickly.

If your mail sometimes cuts out while you're downloading, increase the server time-out setting to give it more time to attempt to maintain a server connection.—Neil Randall

# **Find Your IP Address**

How do I find out what IP address my ISP has assigned me when I connect?

Robert Walton Kansas City, Kansas

The easiest way on a Windows 9x PC is to use the Windows IP Configuration Utility. Select  $Start \mid Run$  and type winipofg in the open box.—Steve Rigney

# CONFIGURE A CHANNEL AS AN ACTIVE DESKTOP WINDOW

If you have a special channel that you want live at all times, consider adding it as an Active Desktop item. An *Active Desktop window* is a dedicated

window that displays part or all of a channel's content. You can size active windows to see just the information you want, such as breaking news, financial market updates, sports scores, and current weather reports (Figure 8).

To select a channel as an active window, right-click on your desktop, choose *Prop*-

erties from the context menu, then click on the Web tab. Be sure that View my Active Desktop as a web page is checked. Click the New button and then click No so you won't go to the Microsoft Active Desktop gallery (although you might want to check that out as well).

After you click *No*, select the *Browse* button in the *New Active Desktop Item* window and click on the Channels folder. In that folder, select the desired channel and click on *Open*, then

choose *OK*. At this point you can add a password, if desired, or determine other settings similar to those available when selecting channels. When you fin-



Active Desktop windows are part of your wallpaper. They lack window title bars and remain onscreen when you minimize all windows. This example shows live weather conditions.

ish making your selection, the new Active Desktop window synchronizes with the Internet for updated content and then displays the content in a resizable window on your desktop. Turning one or two important channels into Active Desktop windows is a great way to stay current.

Michael Muchm. 1837 Micr

Marge Brown is an executive coach and a frequent contributor to PC Magazine. Bruce Brown is a contributing editor of PC Magazine.



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# **Back Up or Fix Outlook Data Files**

One Outlook user's journey beyond the land of lost data and back again.—By Neil Randall

any of us depend on Microsoft Outlook for e-mail, appointments, and contact information, but there's a potential problem: All of this information is usually stored in a single file, which could become corrupted or even erased.

Backing up is important, but the process is less user-friendly than it could be, and backups are by default stored in the same folder as the original file. If that folder or the drive on which it is stored suffers damage, you would lose both the original and the backup. But even if you do back up, you may not do so often enough to prevent a fiasco.

Here we'll show you how to (1) back up your Outlook information and (2) fix your Outlook data file if it becomes even partially nonfunctional. For reasons known only to Microsoft, Outlook does not offer an easy automatic backup, as other PIM software our own.

folder, preferably on a different hard disk (which means it will be available even if there's a full disk crash). You can load this saved file into Outlook through the File | Open Special Folder | Personal Folder command, and you can import the saved data into your current Outlook.pst file through the File | Import and Export command.

Outlook provides two other ways to back up your data: Export (File | Import and Export) and Archive (File | Archive). Archiving moves your oldest Outlook data into a different PST file (called Archive.pst by default), and removes that data from Outlook.pst. If AutoArchive is enabled, you can set archive options for each

folder to indicate whether Outlook should move items of a certain age to the archive or simply delete them. This is the only automatic backup facility Outlook offers, and while it's useful for organization, it's too complex for quick, easy backups.

Export is even more complex. The difference between

Export and Archive is that Export copies the data to the specified file but leaves the data intact within Outlook.pst itself. For this reason, it's often the better of the two backup methods.

To back up using Export,

- 1. Select File | Import and Export.
- 2. Choose Export to a personal folder file (.pst)from the Import and Export wizard. (In Outlook 2000, choose Export to a file.)
  - 3. Click Next.
- 4. Select which folder you want to back up; to back up the whole thing, select Personal Folders at the top of the dialog and make sure the check box labeled Include subfolders is checked (Figure 1). In Outlook 2000, choose Personal Folder File from the Export to a File dialog.
  - 5. Click Next again.
- 6. Here Outlook 2000's Export Personal Folders dialog lets you choose which Outlook folders you want to back up.
  - 7. Click Next and allow the default replacement

# **Decimal to Hexadecimal** and Back in Excel

I'm not a macro writer by any stretch of the imagination. I'd like to know how to perform hexadecimal-to-decimal conversions and vice versa by using a macro in Microsoft

> Paul Troy Rolling Meadows, Illinois

Don't worry—the conversions you've requested don't require any macros. You just need to install the Analysis ToolPak, an optional component of Excel 97. You'll find it in Office 97 Setup under Excel Add-Ins. After installing the Analysis ToolPak, choose Add-Ins from the Tools menu in Excel, and put a check next to Analysis ToolPak.

The HEX2DEC and DEC2HEX functions will now appear in the function list, under the Engineering category. This category includes functions to convert between the binary, octal, decimal, and hexadecimal number systems, as well as functions for manipulating complex numbers.-Neil J. Rubenking

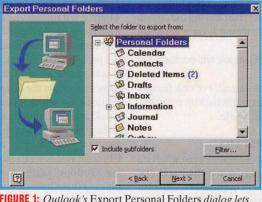
# Round to Nearest Quarter in Access

In Microsoft Access 2000, how can you round to the nearest guarter? I have a field called Yardage and a field called YardagePattern that is 25 percent more than Yardage. Yardage is sold by quarter vards, so I need to round YardagePattern up to the nearest quarter yard. For example, if Yardage is 3.5, YardagePattern is 4.375, which rounds up to 4.5.

> Eddie R. Angulo Los Angeles

You can use a trick with the Int() function to round numbers up. Both Int() and Fix() return the integer part of a number. Fix() just strips off the fractional part, whether the number is positive or negative, but Int() always rounds down. So, for example, Int(-8.3) would be -9. To round any number up, pass its negative to Int() and take the negative of the result.

To round a number to the nearest quarter, pass 4 times that number to Int() and divide the result by 4. The value you want rounded is [Yardage] \* 1.25. Multiplied by 4, that becomes [Yardage] \* 5. The expression



titles do, so we're on FIGURE 1: Outlook's Export Personal Folders dialog lets you choose which folders to back up.

# BACKING UP THE PST FILE

Outlook information is stored in a data file called a personal folder file with a .pst extension. On installation, Outlook establishes a file named Outlook.pst. In Outlook 97, this file is located right in the Windows folder, but in Outlook 2000, it's deep inside Windows\Local Settings.

Local Settings is a hidden folder, so seeing it in Windows Explorer or My Computer requires entering the Folder Options dialog available by selecting View | Folder Options in any folder window. Click on the View tab and then on the Show All Files radio button beneath the Hidden Files option. You'll find Outlook.pst inside the Windows\Local Settings\Application Data\Microsoft\Outlook directory. (Note that in Windows NT you'll need to look in the userspecific folders).

The fastest and easiest way to back up your Outlook data is to copy this file to a different

# TO USER

=-Int(-[Yardage] \* 5) / 4 combines these two techniques, adding 25 percent to *Yardage* and rounding up to the nearest quarter yard.—*NJR* 

# A Surprise Effect of Numeric Precision in Excel

I recently came across something peculiar in an Excel 2000 spreadsheet that I prepared for tracking credit card information. A 16-digit entry in the card number field will have a zero at the end, regardless of the digit entered. Excel is not rounding; it just inserts the zero there. A 15-digit entry is accepted correctly. The column is formatted as a numeric entry with no decimals and a field width of 20. Is there something here that I am missing?

Scot Knox via the Internet

Here's the problem: Your credit card numbers are being stored internally as IEEE 8-byte floating-point quantities. This data type has a precision of from 15- to 16- decimal digits. You're trying to represent a 16-digit number, and that's just a bit beyond the capacity for this data type. In fact, Excel Help refers to "full precision" as 15 decimal digits.

The solution is simple: Format the cells in the credit card column as text.

That way, they'll be stored as strings of digits with no limit on precision.—NJR

# **Decimal Tabs in Word**

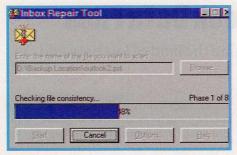
I am a chef, and I rewrite my menu in Microsoft Word 97 several times a week to reflect the availability of local products.

Alas, the prices on the right side look a bit ragged, and I can't get them to line up. Is there a way to snap them into alignment?

Narcis Weers

The obvious answer is to use a decimal tab. You can insert a decimal tab in Word 97 by choosing *Format* | *Tabs*, choosing *Decimal* for *Alignment*, and entering a tab stop position. Now you can enter the price on the appropriate lines by hitting the tab key to tab over to the decimal tab, then hitting the period—or decimal point—at the appropriate point in the price.

The prices will line up on the decimal point, with the position of the decimal point defined by the position of the decimal tab.—M. David Stone



**FIGURE 2:** The Inbox Repair Tool analyzes PST files and attempts to repair or recover messages.

option (you can change this in subsequent backups if you wish). Office 97 users may need to install the Converters for Outlook, which is available at http://officeupdate.microsoft.com/ downloadDetails/outcvt.htm, for this step to work.

- 8. From here, specify precisely where you want the data to be stored; saving your data to a folder different from the one containing your original PST file is better than leaving the data in the same folder, and storing it on a separate drive is best.
- 9. Click *Finish* and Outlook will perform the export operation.

If you use Outlook's calendar or task feature to remind you to perform this backup every few days or so, you'll be fairly safe.

# FIXING A DAMAGED PST FILE

Outlook is normally quite stable, even when it's used for daily and long-term e-mail and PIM functions. But a problem occurred recently for this writer that emphasized the importance of

backing up. My Inbox folder simply locked up, and messages could neither be deleted from it nor moved to other folders. I could read and reply to them, but the entire idea of organization was lost. (The Outlook.pst file was roughly 165MB, but this is not an exceptional size for a primary information management program that stores binary attachments as well as messages, schedules, and contact information.)

When I attempted to delete or move a message, Outlook responded with an error message stating, "The messaging interface has returned an unknown error. If the problem persists, restart Outlook." Restarting Outlook did nothing, and a search for this error message on Microsoft's Web site said essentially that this is a blanket message for several possible problems. One suggestion was to use the Inbox Repair Tool (Figure 2). You should find this tool in your System Tools folder (Start | Programs | Accessories | System

Tools), but if it's not there, search your hard disk (Start | Find | Files and Folders) for a file called Scanpst.exe. If you still can't find it, search your Office 97 or 2000 CD. This simple utility lets you select a PST file for analysis and attempts to repair and recover any entries. If it succeeds, it places these entries in an Outlook folder called Recovered Personal Folders. To learn more about this tool, search for article #Q181523 on the Microsoft site at http://support.microsoft.com/support/kb/articles/Q181/5/23.asp.

In this case, however, there were two problems with using the Inbox Repair Tool. First, it didn't fix the initial problem; the messages were still locked inside the Inbox folder. Second, after several attempts at repair, the process deleted the Inbox folder's subfolders, where most of the saved messages had in fact been stored. Happily, the Inbox Repair Tool recommends that you back up the PST file first, and I had done this, so the backup file became the usable file.

Then it was on to other ideas, and this is where it got interesting (if more than a bit trying). Keep in mind while following these steps that there are undoubtedly other ways to solve the problem, but this one worked. The first step was to create a brand new Outlook.pst file to copy items from the original file. Outlook loads Outlook.pst when it launches, and a new file would make the program fully functional again. Doing this meant closing Outlook, then renaming the original file to, say, Outlook1.pst (through Windows Explorer), and then launching Outlook again. A warning message explained that Outlook couldn't find the default personal folders file, and a dialog box offered to

# CRIB SHEET

REPRIRING YOUR OUTLOOK FILE

- Back up your Outlook.pst file to two or three different locations, so that if your experiments corrupt or destroy one such file, you'll always have another to work with.
- Try the Inbox Repair Tool first (Scanpst.exe); if it creates folders named Recovered..., click on them and copy the recovered data into the appropriate Outlook folders.
- Reduce the size of your Outlook.pst file by archiving large folders filled with older items (your Sent Items file is a primary candidate, or a folder carrying messages from an old project). Instead of archiving, you can export the folder and then delete it from your Folder List.
- Import isn't as selective about specific folders as Export is; opening the entire PST file you wish to import and then copying the folders or individual items from that file to your Outlook folders is easier.
- When you've completed your repairs, back up your Outlook.pst file again!

create a new Outlook.pst. A click or two later, the fresh, new, and empty Outlook was on the screen. To make things easier from this point on, I displayed the Outlook Folders by selecting *View | Folder List.* 

The next step was to transfer the old messages and other data from the original PST file to the new one. I loaded the original file, Outlook 1.pst, into the current view with File | Open Special Folder | Personal Folder. The contents of the original file appeared below the current Outlook folders in the Folder List, and then it was a simple matter of right-dragging each folder to copy it from its location in the original file to the same location in the new file. (Left-dragging would have moved the folder rather than copying it, and keeping the original intact was a goal.) This went smoothly as long as the folder being copied bore a different name from any folder existing in the new Outlook.pst. But I had to copy Outlook's default folders—Inbox, Outbox, Sent Items, Calendar, Tasks, and so on—item by item from the old folder to the new folder of the same name. Even so, Calendar items cannot be copied in this way and in this particular case, I couldn't copy the items in the Inbox folder either.

Ultimately, I had to export the old Inbox

folder only, then close the Outlook1.pst file by right-clicking on its main folder and selecting *Close Personal Folders*. Next came opening the exported Inbox and copying the items from there. As for the calendar, the easiest solution was, unbelievably enough, to open an account at Visto.com ( *www.visto.com*), a free Webbased PIM service that lets you import Outlook calendar items.

Next I had to rename the two PST files again so that the old one was the default Outlook.pst, and then I launched Outlook. I imported the calendar into the Visto account. Finally, I renamed the two PST files once more, so that the new PST file was the default Outlook.pst again, and downloaded the Calendar items from the Visto account to Outlook through a special utility available on the Visto site.

Obviously, this is a lot of work. But just as obviously, for anyone who relies on Outlook, it's well worth the effort. You can't replace months and months of e-mail messages, journal items, task lists, and everything else that Outlook contains.

Neil Randall is a contributing editor of PC Magazine.

# Access Masks: Stored or Not Stored?

Microsoft Access lets you create input masks, like (555) 555-5555 for phone numbers, so you can type numbers during data entry and let Access add the parentheses, space, and dash. When you create a mask, Access asks whether to store it with the data. It's sometimes useful later to know whether the mask is stored, but it's not clear how to find out. Is this information available anywhere—as a property of the field, perhaps?

Gary Bryant via the Internet

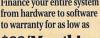
The information is in the Input Mask property, but it isn't obvious. The input mask takes the form: x;y;z, where x is the mask and z is the character Access will display in the field during data entry to indicate the position of the next character. The y tells you whether the mask is stored in the field. If y is 0, the mask is stored. If it is 1 or blank, it is not stored.—MDS

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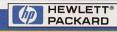
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# **One Computer, Many Users**

Give your users their own personal systems, even if you have more users than machines.—By M. David Stone

f you have more computer users than computers, odds are you've discovered that different people prefer different settings. This applies to both Windows and applications such as Word that have many options. With this in mind, you may have settled for compromising on some settings and changing others as needed.

The good news is that you don't have to compromise or fiddle with settings constantly. Windows can track any number of users—a feature you'll find in both Windows 95 and 98, although we'll cover the specifics only for the original version of Windows 98 here. The procedures are similar across all the Windows 9x platforms.

ture on. Choose Next to turn on the feature and go to the Add User dialog box. Then enter a user name to start creating a user profile.

You can enter a first name, initials, or anything else that will uniquely identify you on the system. As a rule of thumb, try to pick a short name you can type quickly. The more easily you can type the name, the less of a chore it will be to type each time you need to log on.

Click Next and Windows will let you enter a password. Consider this step optional, because the password doesn't offer much protection. It will stop another user from signing on with your user name and modifying your settings directly,

but because all users have access to all

files on the disk, the password will do nothing to keep your data files private.

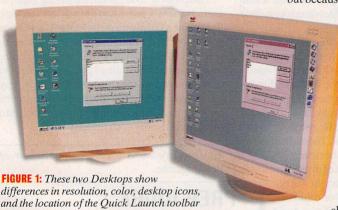
If you do enter a password, you'll have to enter it every time you sign on, which can be annoying. Leave it out, and you can just type your user name and hit Enter. If you're still not sure whether you want to use a password, you should probably enter one.

You can always delete it later.

When you finish with the password, click Next to go to the Personalized Items Settings dialog box. The choices in this dialog box are the most important, because they control what you can customize. The five check box items in this dialog cover the Desktop folder and Documents menu, the Start menu, the Favorites folder, downloaded Web pages, and the My Documents folder.

You can check any combination of these items and then choose Create Copies Of The Current Items... or Create New Items.... The personalization choices are straightforward, but to understand the option for creating new items, you should understand how Windows keeps track of the various settings and what Windows does behind the scenes when you create users.

Many Windows customizations simply reflect the contents of various directories. For example, the Desktop is built from the items in the C:\Windows\Desktop directory, with each icon on the Windows Desktop matching a file or a di-



(along the right edge of the Desktop in one, and as part of the taskbar in the other).

When you set this feature appropriately, all users can customize their own Desktop settings, including the icons on the desktop, the number and positions of taskbars, and the items that appear in the Start menu (see Figure 1). Users can also set their own desktop colors, wallpaper, and even resolutions. And for programs that store their option settings in the Registry—which includes most programs today—each user can set the program options once and have them available whenever using the computer.

The feature that lets you accomplish all this is called Multiple User Profiles. To take advantage of it, choose Start | Settings | Control Panel, then Users. If you've already created at least one user, Windows will open the User Settings dialog box, with a list of users and a New User button that will guide you through the steps of creating additional users. If you haven't created a user yet, a dialog box will let you turn the multiuser fea-

# **Removing the Windows** Stripe

I've been wondering whether it is possible to remove the Windows 98 stripe from the Start menu. I tried using PC Magazine's DecoMenu utility, but that only replaces the icons. Can you help me?

> Dave Overton via the Internet

As noted, the DecoMenu utility creates a second stripe bitmap by replacing the icons for Start menu items. It does nothing to change the original bitmap. But you can very easily suppress the Windows version stripe bitmap: You simply use small icons in the Start menu. Right-click the taskbar and choose Properties. Check the box that says Show small icons in Start menu. Then click OK. The Windows version stripe will be gone.-Neil J. Rubenking

# **Convert to FAT32 Despite Bad Clusters**

I've tried to convert my system to FAT32 using the conversion tool that came with Microsoft Windows 98. The problem is, my hard disk has some bad clusters and the conversion utility refuses to do the job with the bad sections on the disk. Is there any way to convert my file system to FAT32? **Brian Pulley** 

Downey, California

The FAT32 conversion utility supplied with Win 98 is, as you've noticed, very "fragile." A single bad cluster on the disk and it gives up. In addition, it's one-way; if you decide later that you don't want FAT32, you're out of luck.

Fortunately, third-party partitioning utilities do a much better job. The two main contenders are Partition Commander, from V Communications (\$39 list, www.v-com.com), and PartitionMagic, from PowerQuest (\$69 list, www.powerquest.com). Either of these products converts a FAT16 partition to FAT32 even if it contains bad sectors, and they convert it back again, too. They also provide a huge assortment of other nondestructive partitioning services, such as resizing partitions without damaging their contents.-NJR

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# TO USER

# How to Create a Shortcut

In Microsoft Windows NT, how would I go about creating a shortcut to an executable program? I want a non-Internet shortcut.

Genoa, Illinois

In Windows NT 4.0, you can very easily create shortcuts to executable programs or to data files that are associated with executable programs. Launch Windows Explorer and navigate to the folder that holds the file in question. Using the right mouse button, drag the file to the desktop. In the menu that pops up, choose Create Shortcut(s) Here. That's it. You can follow the same instructions to create shortcuts in Windows 95 or Windows 98.

You may prefer to move your shortcut into the Start menu. Right-click the Start button, choose Explore, and open the Programs folder, which corresponds directly to the Programs menu. Locate the folder into which you want to move your new shortcut. Now right-drag the shortcut from the desktop into that folder. This time, choose Move Here when the menu pops up.-NJR

# Clearing the Run List

How can I clear the list in the Start menu's Run dialog in Windows 9x? Can I do this without using an outside utility?

> Al Fnochs Bradenton, Florida

Indeed you can; you don't even have to use Regedit. Launch Notepad and create the file Cleanrun.inf, containing precisely these six lines:

[version] signature="\$CHICAGO\$" [DefaultInstall] DelReg=DeleteMe [DeleteMe] HKCU, "Software\Microsoft \Windows\CurrentVersion \Explorer\RunMRU"

The long sixth line is word-wrapped for publication; be sure to put everything from HKCU to \RunMRU" on a single line with no spaces. To clear the Run dialog's history list, just right-click this file in Explorer and choose Install from the pop-up menu. Then log off or restart Windows.-NJR

rectory in the Desktop directory. You can even add items to the Desktop by copying the appropriate file to the Desktop directory. Similarly, each item on the Favorites list matches a file or directory in the C:\Windows\Favorites directory.

Most of the other settings that Windows tracks are stored in the Registry. The Registry itself consists of two files, System.dat and User.dat, both of which are in the Windows directory. As the names imply, the System.dat file holds the information that applies to the system itself at all times. The User.dat file contains settings that can change with different users such as option settings for various programs.

When you turn on the multiple-users feature, Windows modifies the Windows directory structure and creates additional User.dat files. First, it creates a directory called Profiles in the Windows directory. Then it creates a subdirectory inside the Profiles directory for each user you define. Create three users named Larry, Moe, and Curly, for example, and you'll find three directories in the Profiles directory named Larry, Moe, and Curly.

Inside each of these user directories you'll find a User.dat file. When you log on using any of these user names, Windows loads the Registry using the System.dat file in the Windows directory and the User.dat file from the appropriate user directory. Any changes you make to settings that go in the User portion of the Registry will go into the appropriate User.dat file. These changes will not affect the settings for other users.

You'll also find a new set of directories inside each user directory. The exact list will depend on which items you've told Windows to personalize. Even if you don't check off any of the options, Windows should create an Application Data directory (to store your Quick Launch icons, if nothing else), a Cookies directory, and a History directory for each user.

Additional directories can vary for each user. If you told Windows that you want to personalize the Desktop, for example, you'll find a Desktop directory. Users with their own directories for any given personalization option will have separate control over that option. Users without directories for that option will share the standard directories in the Windows directory.

All of which brings us back to the option for how to create these items when adding a user. If you choose Create Copies Of The Current Items And Their Content, Windows will copy all the contents of each original directory to the appropriate user directory. If you choose Create New Items To Save Disk Space, Windows creates empty directories. It's usually a good idea to copy the current items and let the user customize the settings, rather than making the user start from scratch.

When you finish defining the user's personalization options, Windows will return you to the User Settings dialog box, which will now show a list of users. To rerun the wizard and add more users, choose the New User button. Note that once you've created a user profile, you can change its settings by going to the Control Panel, choosing *Users* to open the *User Settings* dialog box, selecting the appropriate user, and then choosing Set Password or Change Settings.

With multiple users defined, switching from one set of user customizations to another is as simple as choosing Start | Log Off, then logging on as another user. Each user can set the customizations he or she prefers, and most settings will survive changes by other users.

There's more to say about managing multiple users, but this is enough to get you started. One final point to be aware of, however, is that once you've created multiple users you'll have to work a little harder to install new programs. Most installation routines put the program in only the current user's setup. One easy way around complications is to install new programs once for each user, installing the program into the same directory each time.

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

# PREP WORK

Before you create multiple users, think about the settings that will remain the same across the user base. You can often save time and effort by configuring those items first. In general, follow these guidelines.

Any customization that more than one user needs is easier to install once at the beginning than to install later for each user.

It's generally easier for users to delete options they don't need (certain desktop icons, for example) than to create them.

With these in mind, get as much of the work done ahead of time-before creating multiple users-as appropriate, including the following:

- Install all core programs, such as word processors, that all or most users will need.
- Set up all the Desktop icons that any user will
- Set up the Start Menu, with duplicate icons in different locations, if appropriate, to match different users' needs.
- Make sure the Quick Launch toolbar includes all the icons that any user wants.

### **USER TO**

### **VPNs and Windows 2000**

With Windows 2000, standards-based virtual private networking is integrated into the operating system.—*By Eric Greenberg* 

Security

ssociation 2

Internet

Security Association 1

(ESP transport)

icrosoft Windows 2000 introduces powerful standards-based virtual private network (VPN) capabilities. VPNs offer a path towards decreased networking costs, enhanced productivity for remote users, powerful security capabilities, and rapidly deployable e-business services. By adding support for dial-up VPN capabilities natively within the Windows 2000 client, Microsoft has eased the complexity of deploying VPN functionality to the desktop. For LAN-to-LAN VPNs, Windows 2000 server lets companies overlay VPN functionality on their existing IP router network.

Establishing a virtual private network using the public Internet requires two essential capabilities: *multiprotocol tunneling* and *security*. To accommodate these, Windows 2000 imple-

ments two important Internet Engineering Task Force (IETF) VPN standards: the Layer 2 Transport Protocol (L2TP) for multiprotocol tunneling, and IP Security (IPSec) for security. Windows 2000 support for digital certificates further enhances VPN security.

The Internet is based entirely on the Internet Protocol (IP) standard. Private networks, however, often incorporate more than just IP. Typical multiprotocol networks require support for Novell

NetWare IPX or IBM SNA in addition to IP. Multiprotocol tunneling allows multiple protocols to be encapsulated within an IP packet, transported across the IP-only Internet, and then de-encapsulated at the destination private network. Corporations may also tunnel IP traffic in their private IP address space, either because their internal addresses were not assigned by a public Internet registry or in order to shield their private IP address space from intruders.

L2TP allows multiple tunnels to be created between the same source and destination. Network traffic can thus be prioritized and, based on the needs of the application, one tunnel can receive a higher quality of service (QOS) compared with another. To allow for improved scaleable performance, Microsoft's L2TP supports the Multilink Point-to-Point Protocol

(MPPP) IETF standard. This feature allows a Windows 2000 server to load-share across multiple ISP Internet connections, and for the destination Windows 2000 server to reassemble and reorder data received as required.

#### **VPN SECURITY**

A multiprotocol VPN is created by wrapping private network packets in a tunnel and managing the security of the tunnel as it is transported across the open, unsecured Internet. When securing a tunnel, we are concerned with the following fundamentals:

**Authentication and Authorization.** It's necessary to know if the site (LAN-to-LAN) or user (telecommuter) is authorized to participate in the

Windows

2000 server

VPN. To answer this question, an entity must provide some kind of proof, such as knowledge of a pass-

word or ownership of a digital certificate and an associated private key.

IPSec allows an entity to authenticate itself using these mechanisms.

Privacy. Information transported over the VPN must be kept private. IPSec offers encryption capabilities for privacy.

Firewall privacy.

Integrity. Data transported across the VPN should be protect-

ed from tampering. IPSec offers data integrity capability.

IPSec is an additional protocol layer added to standard IP Version 4 (IPv4) packets (IPv4 is the version used on the Internet today). For the next generation of IP (IPv6), IPSec is natively integrated via an extensible header mechanism. With Windows 2000, IPSec can be used to carry L2TP tunnels.

IPSec can be viewed in terms of its major features:

- Authentication Header (AH), which allows two VPN entities to authenticate themselves to one another. AH does not provide privacy.
- Encapsulating Security Payload (ESP), which allows two entities in the VPN to exchange information privately and with integrity. ESP also supports authentication.

#### **FoxPro Speed Bump**

I upgraded my computer to a Pentium II/350. Now my FoxPro 2.6 application generates an error message whenever I try to use it. Is there a conflict between FoxPro 2.6 and my system?

Jherry Mari Manila, Philippines

There's a known problem that can occur when running FoxPro 2.6 and 2.5 applications on machines with clock speeds greater than 300 MHz. Unfortunately, FoxPro runs into difficulties starting up at these higher speeds. The solution is to patch the FoxPro runtime using the Patch\_26.exe file available at the following location on the Internet: http://support.microsoft.com/support/kb/articles/q186/8/34.asp.

Additional information regarding this problem can be found at www .vss-inc.com/slowstart.htmland www .abrl.com/foxpro.html.—Sal Ricciardi

#### **PC Upgrade Concerns**

New PCs are announced so often that our IS staff resists upgrading; they fear that support will be an endlessly shifting nightmare. Is there any way we can upgrade without having to worry about constant change?

Terry Katz

Milpitas, California

Look for long product life cycles by contacting manufacturers' corporate sales departments. PC company Web sites and retail sales channels promote the latest and greatest, but the corporate sales divisions of all major computer vendors understand your needs and try to address concerns about rapid product changes. Compaq, Dell, HP, IBM, Micron, NEC, and Toshiba, among others, can all discuss product life-cycle plans. To some extent, they are also able and willing to share product roadmaps to assist customers in planning future purchases.

The maximum time period you're likely to find for a given PC platform's stability is 12 to 18 months (the industry as a whole moves too fast for longer periods), though with customer commitments to purchases over time, some companies might be willing to stockpile systems and components. Some companies also have special financial arrangement for long-term

### TO USER

purchase plans. Computer manufacturers want corporate and departmental business, so your negotiating power is high.-Bruce Brown

#### **Doing More on the Web**

My company already uses the Internet for e-mail and to communicate basic information about our products to existing and potential customers. We don't want to sell via the Internet because we use direct sales reps. but we do feel that we could be doing more. Any suggestions for taking the next step? Ralph Green

Chicago, Illinois

Communications with remote staff is a challenge for many companies. In addition to checking inventory and placing, fulfilling, and tracking orders, remote personnel have to rely on the home or regional office for updated marketing and sales materials.

If you already have an order-entry system in place, the next best use of Web space is to store updated marketing and presentation materials. If your traveling representatives can access the latest company releases, spec sheets, price lists, product drawings, diagrams, slides, and even photos of the home office and staff from their hotel rooms before heading out to visit customers, they will be better prepared to carry and present your message.

If you have fast Internet connections, representatives can download Power-Point presentations, but even a relatively slow connection can be used to access updated slides. With a fast connection, you might even be able to use the Internet to make presentations directly-without downloading. One reason to consider upgrading to Microsoft Office 2000 is its increased ability to convert application files to HTML formats, which will help remote personnel and customers access them. -BB

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- Internet Key Exchange (IKE), which extends IPSec in order to provide VPN authentication based on digital certificates.
- · Security Associations (SA), which allow different VPN devices to establish their own AH and ESP relationships with one another. This is illustrated in the diagram, which shows how AH, ESP, and SA capabilities can be used to meet the needs of the corporate firewall administrator. The figure shows an ESP SA between the two firewalls, and an AH SA between the two endpoints of the tunnel (the two Windows 2000 machines). Corporations may wish to encrypt between their firewalls and then require only authentication once inside the firewall. This lets a company monitor unencrypted traffic for suspicious behavior just as it does today without VPN capability. Windows 2000 administrators can configure custom IPSec security policies using the IP Security Policies Microsoft Management Console (MMC) snap-in.

#### DIGITAL CERTIFICATES AND PKI

The Windows 2000 VPN feature set includes support for public key cryptography, enabling the use of digital credentials called digital certificates. Digital certificates are managed within an overall Public Key Infrastructure (PKI). The Windows 2000 PKI offers an integrated client, server, certificate authority, and directory server (Active Directory).

Public key cryptography is a stronger form of security than user names and passwords. Public key cryptography relies on an entity (user or corporate site) having two very long keys, one kept private (the private key) and the other public (the public key). The most important property of these keys is that if an entity's public key is applied to data, then the only way to get the data back and read it is to have the private key. Thus, if I want to send data to Alice and make sure only she can read it, then I apply Alice's public key to the data. Because only Alice has the associated private key, only Alice can read the data. This is called public key encryption. If I want to send data to Alice so that she knows that I sent it, then I apply my private key to the data and Alice uses my public key (which she is assumed to have received securely) to read the data. If the data makes sense, she knows I must have sent it to her, because I'm the only one who has access to my private key. When I apply my private key to data, I am digitally signing that data.

How does Alice know she has my public key and not one from someone impersonating me? The answer is, she doesn't, unless I either physically deliver it in a secure fashion or she relies on someone else to authenticate me by digitally signing my public key. This third party is known as a Certificate Authority (CA). Operators of CAs authenticate individuals and issue certificates. Certificates are digitally signed by the CA and contain the public key and important VPN user- and site-identifying information. All parties relying on the CA are assumed to have received, in some secure fashion (such as during physical software installation) the public key of the CA in order to validate certificates issued by it.

Corporations may choose to implement Microsoft's CA server and perform user and site authentications on their own, or they may contract with a trusted third party (TTP) running a secure CA facility and authentication process, such as Digital Signature Trust or Verisign. Note that CAs can be implemented in hierarchies (chains of trust). Therefore, for example, particular divisions of a company could run their own CAs, and a corporate-wide CA or TTP could be used to certify each of the individual CAs.

Ideally, you install the Windows 2000 Certificate Services at the time Windows 2000 is installed, though you can add them later. Certificate Services are nicely integrated into the overall Windows 2000 user-management facility. When you create a new user under Windows 2000, the server places certificate registration Web pages into the user's log-in directory. This allows a corporate administrator to merely point users to these registration pages to begin the certificate enrollment process.

When first installing Certificate Services, the administrator must choose the level of CA services to be provided within the organization. There are four choices, which depend on whether you are using Active Directory and whether you are installing a CA that is at the top of the CA hierarchy or one that is a subordinate CA.

An important benefit of using Microsoft Certificate Services is its optional tight integration with Microsoft Active Directory. Certificates can be stored in Active Directory and users can authenticate to Active Directory using their certificates rather than the less-secure Kerberos user name and password.

#### CONCLUSION

Windows 2000, with its support of important open VPN standards in combination with a wellintegrated PKI, offers a value-added platform for consolidating private networks onto the Internet and enabling e-business transactions on a broad scale. R

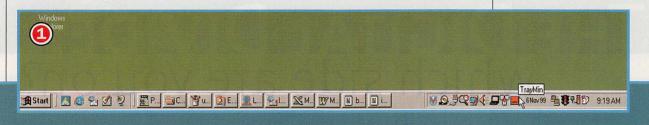
Eric Greenberg is the author of Network Application Frameworks, published by Addison Wesley Longman. You can reach him at ericgr @seinedynamics.com.

### utilities SOLUTIONS

### **Minimize Apps to the Tray**

Put program icons into the system tray—even if they're not designed for it—to save space on your taskbar.—*By Steven E. Sipe* 











oday's huge hard disks and massive amounts of RAM let you open many programs at once. The result, however, can be an extremely cluttered taskbar. Some programs are designed so they can be minimized to the tray; many people prefer this option, because the icons take up less space. But what if an application was not designed with this capability?

PC Magazine's **TrayMin** utility can solve the problem. When TrayMin is loaded, rightclicking on any application's minimize icon will cause the application to be minimized to the tray, rather than to the taskbar. To minimize an application to the taskbar, simply left-click the minimize icon as usual. When you minimize more than one instance of the same program to the tray, TrayMin appends numbers to each instance's icons.

TrayMin runs under Microsoft Windows 95, Windows 98, and Windows NT 4.0. An article about how to use TrayMin and how it was written is available on our Web site at www.pcmag.com/utilities. A link to download the TrayMin utility and its source code can also be found there.

- 1. When you have many programs open at once, the taskbar quickly fills up and the buttons become too small to read. With TrayMin, you can minimize open programs to the tray, opening up room on the taskbar. TrayMin's tray icon resembles a yellow minimize button.
- 2. Here, the only program remaining on the taskbar is the one in use to take the screenshot. Notice that there are two instances of Word-Pad minimized to the tray. TrayMin appends a number to the standard tooltip (detail), indicating which is the second instance.
- 3. To restore a program minimized to the tray, simply click on its tray icon. You can also right-click on a program icon in the tray to bring up its system menu. From here, you can restore, minimize, maximize, or close the application.

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Steven E. Sipe, the author of TrayMin, is a developer at Information Architects in Charlotte, N.C. Sheryl Canter is the editor of the Utilities column and a contributing editor of PC Magazine.

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There is a growing gap between those who are technology savvy and those who are not. Who is being left behind and what lasting impact will this have on our children? **Digital Divide** is a groundbreaking PBS documentary that explores the haves and have-nots of the "information age." Watch and find out why it is a much greater issue than access alone.



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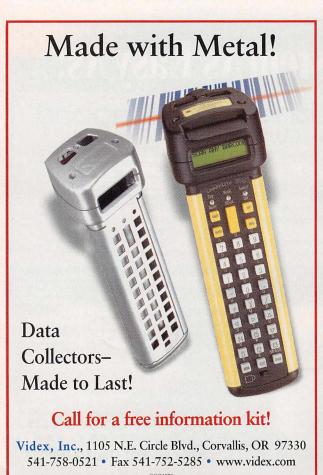
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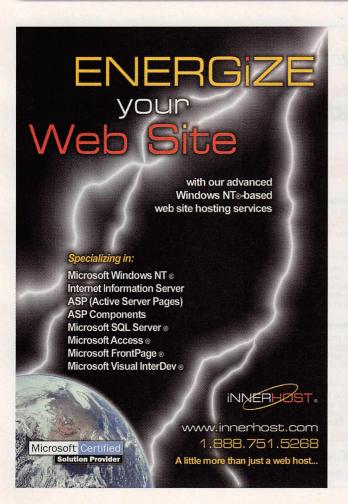






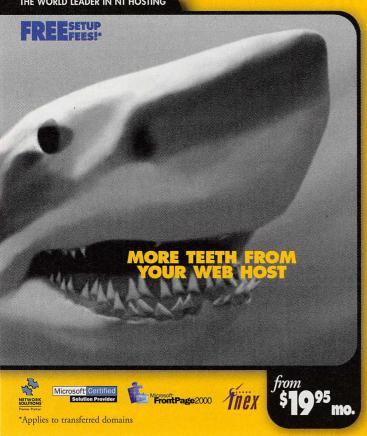






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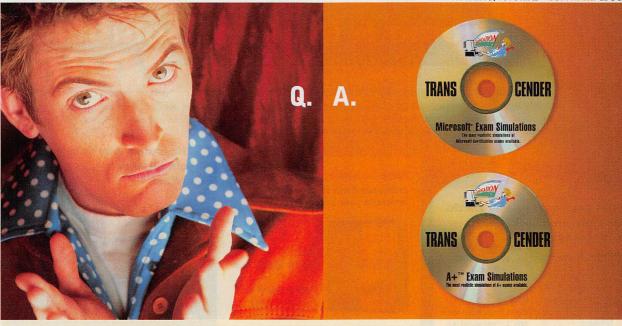
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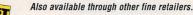
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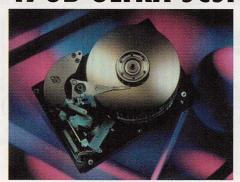
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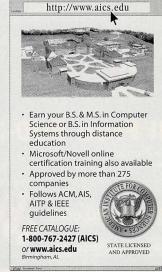
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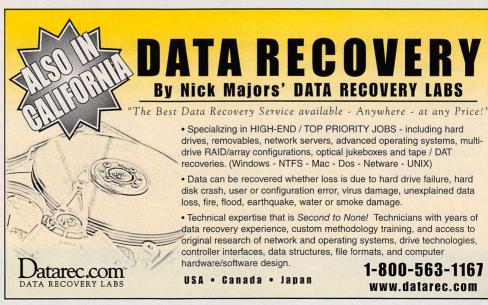
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MULTIMEDIA ENCYCLOPEDIAS

### The World on Your PC

By Craig Stinson

or about a hundred bucks, you can give two kids a day at a theme park. Or you can get a whole year's worth of entertainment with a multimedia encyclopedia—and then put the change in your pocket.

Encyclopedia CDs aren't advertised as entertainment software, but the best are certainly that—and a whole lot more. With videos, sound clips, animations, and more, these products send your kids the important message that learning is adventurous and fun.

All of these new products help you review the events of the past thousand years and think about the age that lies ahead. The Inter-

net will play a huge role in whatever is to come, and with links from encyclopedia articles to evaluated Web sites, the products exercise your skills in exploring the large cyberworld outside your computer.

You can get a lot of the encyclopedias' content onlinesometimes free (see our sidebar). The CDs are worth the cost, though, because they have extra multimedia content and because they are so much faster for most of us to use. We reviewed the highest-end versions and recommend you spend the few extra dollars for them (and for DVD, if it's available).

Absent this year is Encyclopædia Britannica. Although Britannica has decided to put its text on the Web at no charge, the company hasn't abandoned the CD product: It just wasn't ready in time for this story.

#### **Compton's Encyclopedia** 2000 Deluxe

At \$40 (street), Compton's Encyclopedia 2000 Deluxe is a quality two-CD entry aimed at middle schools and at families on a budget. (It's also available in a one-CD Standard version, at \$20 street.) The encyclopedia dates back to 1893; its CD incarnation includes some valuable features for helping to carry out homework assignments and prepare reports.

Although its multimedia

offerings are less extensive than those of some of its competitors, Compton's text is solid and readable. Articles come with outlines, unannotated bibliographies, links to related material on disk, and in-line multimedia items that expand or play when you double-click them.

Regrettably, the encyclopedia articles are provided with only a bare minimum of links to related Internet sites. The product does include a listing of prescreened Web sites that can be searched by keyword. Search results are sorted into age-suitable categories, but an option to rank them by relevance would be more useful.

To bolster its Web offerings, Compton's provides Ask the Librarian, a service that lets the student pose a research question on Compton's Web site. Within two days of posting, the service sends an e-mail that lists relevant Internet resources and articles within the encyclopedia itself.

New in this year's Compton's are a review of the major events of the twentieth century, some additional panoramic views (using IPIX technology), and a link to San Francisco's children's science museum, the Exploratorium. Additional resources carried over from earlier versions include a unique Planetarium (you can use it to explore the night sky at any point on earth, at any date and time), a dictio-

nary and thesaurus,



Score with these two football titles. Page 162.

#### MAISY MAISY

The popular character's new game is a winner. Page 163.

### AFTER HOURS



and Report Starter, which helps kids with the formalities of term-paper preparation.

#### **Microsoft Encarta Reference Suite 2000**



Like Grolier and World Book, this vear's Microsoft Encarta Reference Suite (\$100 street before \$35 rebate), our Editors' Choice.

leads with a splashy millennium feature. More extensive than its competitors', Encarta's Y2K treatment includes Web links, a time line of historical events linked to articles, a set of 34 essays, and 24 lesson plans for teachers of grades 4 through 12.

If you buy the four-CD Reference Suite (as opposed to the two-CD Deluxe Edition for

\$70, or the one-CD Standard Edition. \$40). you'll also get the Encarta new World English Dictionary (which replaces Bookshelf). In addition to providing cultural and etymological notes about new words, dictionary incorporates

thesaurus, a book of quotations, an almanac, and more. With the suite, you also get Encarta Interactive Atlas (Virtual Globe under a new name), a rich set of cartographic information and multimedia treats, and free access (until the end of 2000) to Encarta Online Deluxe, a subscription Internet encyclopedia.

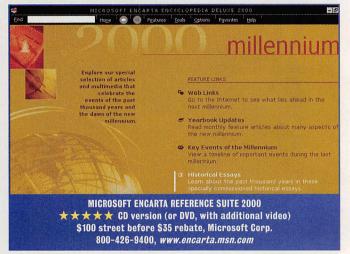
Aside from the millennium articles and links, the important new features in Encarta are a time line and a curriculum guide. You can use the time line feature to see a chronological set of links on particular topics or all topics. To compare events in different eras, you can display two time lines at once.

The curriculum guide is simply a new tool to help you find information of interest. You enter a country, grade level, and

study area, and Encarta lists broad topic areas meeting those criteria. Topic areas list relevant articles and Web links.

With an interface that compels exploration, a clearly written encyclopedia with a wealth of source documents and Web links, the new dictionary, and a superb atlas, the Encarta suite is a tremendous value that should source that Microsoft used for its first version of Encarta. (Microsoft says a small portion of Encarta's articles are still drawn from Funk and Wagnalls.) The Home Reference Library includes the Simon & Schuster English Language Desk Reference, Roget's Thesaurus, Webster's Collegiate Dictionary, and more.

Both products are hosted



be part of any student's or reference software school's library.

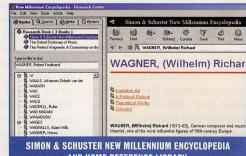
#### Simon & Schuster New Millennium **Encyclopedia and Home Reference Library**

Simon & Schuster is the new player in this year's lineup of encyclopedias. multimedia Priced at \$30 (street), the lowest in our roundup, the two-CD product is also the leanest, missing some of the extras found elsewhere.

Included are the New Millennium Encyclopedia and Home Reference Library, actually two distinct products with a common interface (available at \$15 street apiece). Encyclopedia is Funk and Wagnalls, the same

within Versabook, an electronic text management system from Versaware. Versabook provides search and cross-referencing capabilities, letting you find material of interest with Boolean searches and letting text compilers create hyperlinks between articles.

The Versabook engine also provides a link to Versaware's Internet bookstore, where you can download additional titles (some free, others for a reasonable charge) into either the New Millennium Encyclopedia or the Home Reference Library. This proves the most useful feature



AND HOME REFERENCE LIBRARY. 🖈 \$30 street, Simon & Schuster Interactive 800-223-2336, www.ssinteractive.com

#### **Editors' Choice**

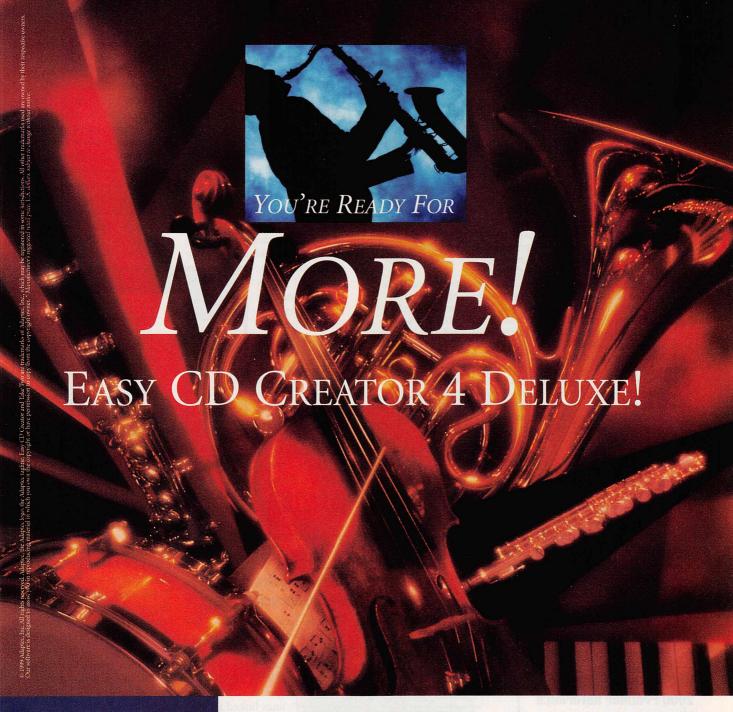
Microsoft Encarta Reference Suite 2000



For this roundup of multimedia encyclopedia products, our Editors' Choice battle comes down to two opponents: Microsoft Encarta Reference Suite 2000 and World Book Millennium 2000 Premier Reference Library. Each offers an impressive

range of features within an easy-to-use and attractive interface. But Encarta edges out World Book and wins our Editors' Choice, because its interface does more to encourage exploration (through browsing), because it contains wonderful sidebar material, and because its atlas is by far the best of all the offerings. World Book nevertheless earns a very hearty honorable mention.







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### **AFTER HOURS**



### Online Encyclopedias

he entire text of the Encyclopædia Britannica—the 44 million words that cost \$1,250 on paper-is now available free on the Internet. Britannica's decision in

October to post its venerable text (along with multimedia enhancements, articles on current events, and more) provoked such a surfer tsunami that the company had to shut down its site and build infrastructure. By the time you read this, the site should be back up, at www.britannica.com.

If Britannica is more encyclopedia than you need, you might turn to other free general-purpose encyclopedias. For example, you'll find the Concise Columbia Electronic Encyclopedia (Third Edition) at www .encyclopedia.com, and Funk and Wagnalls Multimedia Encyclopedia at www.funkandwagnalls.com (though Simon & Schuster uses Funk and Wagnalls content, the Simon & Schuster CD-ROM product contains more multimedia features). You might also want to check out the Information Please Almanacs (www.infoplease.com) and the Encyclopedia Smithsonian (www.si.edu/resource/faq).

The Internet also hosts a huge and growing number of special-topic encyclopedias. Check out the indexes at www.internetoracle.com/ encyclop.htm and www.kalama.com/~mariner/gserencyclo.htm, for example. There you'll find links to such esoteric reference works as the Extrasolar Planets Encyclopedia, Bird's Encyclopedia of Aromatherapy, and the Encyclopedia of Percussion.

Three of the CD multimedia encyclopedias reviewed here have subscription-based online versions. You'll find Grolier Online (\$59.95 per year) at http://go.grolier.com, World Book Online (\$49 per year) at www.worldbook.com, and Encarta Online Deluxe (\$49.95 per year) at www.encarta.msn.com. The online versions duplicate the CDs' contents and supply more timely updates; unless you have a very fast Internet connection, the only thing you lose is speed.

of the Simon & Schuster product. You can build up a sizeable library to sit alongside your encyclopedia—and perform searches across the entire set.

On their own, Simon & Schuster's encyclopedia and reference library don't provide a lot to get excited about. In particular, those who want ample links to current Web offerings or features to assist the young scholar with reports or homework will find more to like in the other products in this roundup.

#### **World Book Millennium 2000 Premier Reference** Library

A new Surf the Millennium option adorns the main menu of IBM's excellent new four-CD World Book Millennium 2000 Premier Reference Library (\$90 street). Here, you can tour ten CD-based Web sites, each representing one century of the previous millennium. Young surfers can read the Hippodrome News on the home site for the 1000s, for example, and link to such places as the Leif Ericson Fan Page.

typical of World Book's youthfriendly approach to learning. Articles in this encyclopedia are clearly written to meet the needs of middle and high schoolers and presented in an inviting layout. Articles are supplemented with bibliographies and study questions, and a set of wizards helps you create reports, charts, time lines, and more.

This imaginative feature is

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ence Library includes the Rand McNally New Millennium World Atlas Deluxe, the Merriam-Webster Reference Library (with a biographical dictionary, a collegiate dictionary and thesaurus, an encyclopedia of literature, an intermediate dictionary, and a medical dictionary), and three Information Almanacs. (Also available are a two-CD Deluxe Edition at \$60 street and a one-CD Standard Edition, \$40 street.) All CD versions include a 60-day trial subscription to World Book Online, which provides

more timely updates and access to more supplementary material than the free online features associated with the CD product.

The package's Internet attractions are extensive. Aside from period article updates, there is access to all of the World Book's archives

(dating back to 1922) and a long list of reports on current topics.

In school or out, on the Web or off, IBM's World Book is a class act.

#### Year 2000 Grolier Multimedia Encyclopedia

For the new millennium, this year's two-CD Grolier Multime-

> dia Encyclopedia (\$59.95 list; upgrade, \$39.95) includes a special set of time lines linked to articles about the past thousand years. You can click to articles and media items about any period's events in politics, science, religion, literature, the visual arts, and music.

Grolier's best feature, however, is its three separate encyclopedias, aimed at three distinct reading levels, in a single package. On each CD, you get a 37,000-article encyclopedia suitable for middle- and high-school use: Major articles are linked to The New Book of Knowledge and Encyclopedia Americana, Internet-based encyclopedias that serve, respectively, elementary school, and high school and collegiate readers.

The Grolier product also includes the American Heritage Dictionary and 1,200 maps. But Grolier has discontinued its five-CD Multimedia Reference



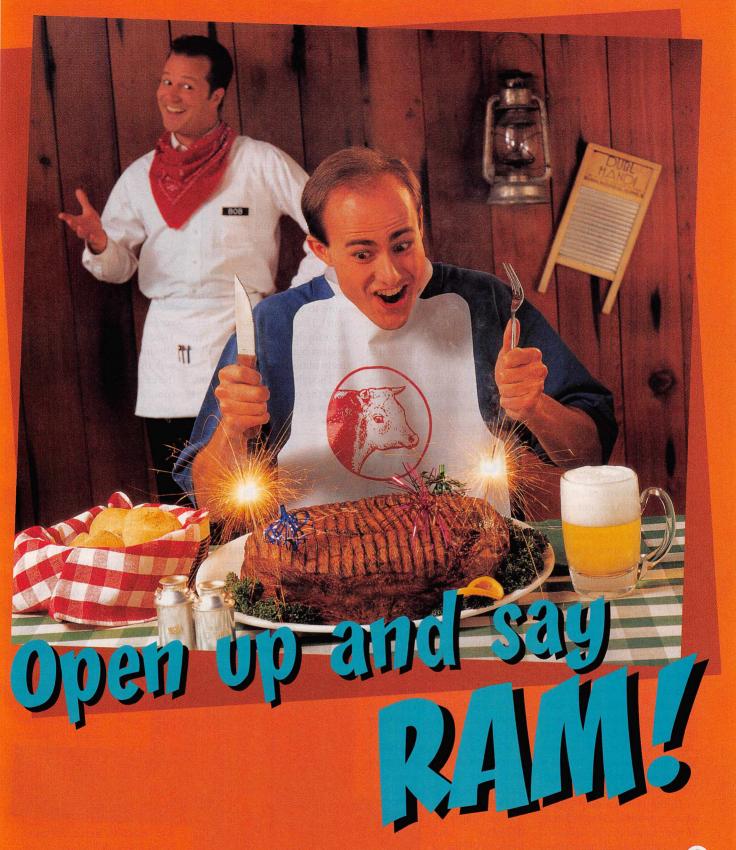
YEAR 2000 GROLIER MULTIMEDIA ENCYCLOPEDIA ★★★★ ★ CD version \$59.95 list, DVD version \$69.95 list, upgrade \$39.95, Grolier Interactive 203-797-3530, www.grolier.com

> Suite, which included the Hammond Atlas and the Wall Street Journal Almanac.

A new feature called Research Starter is designed to help students over the first hurdles in term-paper writing. Unfortunately, unlike Compton's Report Starter (which assists with note-taking), Research Starter merely presents seven broad topic areas: You have to drill down to specific topics.

Grolier articles come with bibliographies and navigable outlines. Major articles also include an Internet index button, which takes you to an annotated list of Web sites related to the current topic. The 26,000 Web links are categorized by reading level and updated monthly.

Though it falls a bit short this vear in comparison with Encarta and World Book, Grolier's supplementary online texts give the product a unique appeal for schools and families that need to serve a spectrum of users.



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### **AFTER HOURS**

REAL-TIME STRATEGY

### Game of Ages

Version II of Microsoft's successful Age of Empires succeeds as well.

#### **Age of Empires II:** The Age of Kings

The original Age of Empires, along with the Rise of Rome expansion pack, brought new complexity to the real-time strategy genre. The incorporation of historical accuracy into resource gathering, technology development, civilization attributes, and military strategy injected life into a genre that had suffered a glut of pretenders trying to emulate successful games like Warcraft II and Command & Conquer. Age of Empires II: The Age of Kings (\$50 street), from Microsoft, picks up where its predecessor left off, starting from the Dark Ages and continuing to the Imperial Age. Again, the game serves up a compelling mix of military strategy and societal development.

AOE II is broken into several components: campaigns, random map games, and Internet play. The campaigns consist of six mission-based games with several chapters, each following the career of a famous military leader, such as William Wallace, Joan of Arc, and Genghis Khan. The artificial intelligence in campaigns is extremely challenging perhaps a little too much so at what should be the easier settings. The tutorial campaign, though, is excellent and adeptly guides newcomers through the game.

In the random map games, where you will likely spend most of your single-player time, you play a battle against up to seven different computer-controlled factions on a map set to your specifications. This component is as challenging as the campaigns—but unlike the campaigns, where every game follows a fixed pattern, random map games change each time. Here you'll really get a feel for the differences among the 13 cultures you can choose from (for yourself and your opponents), one of the main strengths of this component.

Each faction has certain bonuses and penalties for statistics—building strength and production speed, for example. They also each have at least one unique type of fighting unit and certain limitations on research and discovery. These checks and balances ensure that no one civilization is the strongest, although you may find yourself favoring a certain culture based on your particular style of play. The differences also ensure near-unlimited replayability.

Finally, perhaps the best part of AOE II is Internet play Microsoft's Gaming Zone. All incarnations of the Age of Empires series enjoy strong popularity, and at any hour of the day you can find players (expect a typical game to take about an

hour). The game is not very taxing on system resources, so even modem players should get relatively smooth connections.

Though not a huge departure from the original game, Age of Empires II: The Age of Kings is

AGE OF EMPIRES II: THE AGE OF KINGS ★★★★★ \$50 street, Microsoft Corp. 800-426-9400, www.microsoft.com/games

> successful as a next logical step. Tweaks and enhancements abound, so if you're familiar with the series, you'll appreciate the changes. And the satisfying, complex game play will keep you hooked.—Richard Brown

FOOTBALL GAMES

### **Kickoff Time**

Two top football games—just in time for play-off fever.

#### Madden NFL 2000

Microsoft's NFL Fever 2000 may have sharper graphics, but Electronic Arts' Madden NFL 2000 is still the king when it comes to game play. The pace is consistently quick, and you can run the ball effectively in this year's version. Staying between the tackles is your best bet; running backs and some wide receivers will break tackles and struggle for the extra vard. And timing is everything with the passing game: If you wait too long to throw the ball or throw it too soon, depending on what kind of route your wide receivers are running, they won't catch it.

The ability to hot designate routes at the line of scrimmage is a wel-

MADDEN NFL 2000 **★★★★ \$** \$39.95 direct, Electronic Arts, 800-245-4525, www.easports.com

come addition. On defense, tackling is much improved, and players are no longer able to cover unrealistic lengths with a dive. The new menu interface is confusingly inconsistent between areas, but the statistics feature is unmatched, with sortable individual stats and weekly and year-end player awards in the franchise and season modes.-Matthew Elliott and

Daniel S. Evans

#### **NFL Fever 2000**

Microsoft's NFL Fever 2000 is a football game for the action-oriented gamer who likes precise renderings and quality graphics and is less concerned with statistics. In fact, Fever doesn't offer any individual player stats. If you are looking for a sports simulation with multiseasonal franchise play, this isn't the game for you. But it is the best-looking computer football game on the market today. The passing game in

Fever is a little more realistic than in other PC football games: The receivers don't always cut on a dime and sometimes have to fight off defen-

**NFL FEVER 2000** ★★★★ **\$ 19.95** direct Microsoft Corp., 800-426-9400 www.microsoft.com/sports/ fever2000

sive backs to make the catch. Fever also delivers smooth animation and an authentic playbook, with detailed background touches and enhancements. What the game lacks in statistics and features, it more than makes up for with realistic graphics and fluid game play.—ME and DSE

### **Ouick Clips**

#### **Maisy's Playhouse**

Maisy, a popular book and television character, now stars in a computer game for 3- to 6-yearolds. Maisy's Playhouse invites kids to explore three rooms and seven differ-



ent activities. The objects and decor in Maisy's rooms change with each visit, and games can be

played at three difficulty levels. The activities promote basic early-learning skills such as counting, color recognition, and social behavior. The graphics are clear, bright, and child-friendly, and a gentle voice provides clear instructions and encouragement as you proceed. \$20 street; Sound Source Interactive Inc., 818-878-0505. www.soundsourceinteractive.com.

#### **Face Factory**

If you haven't got anything more fun than a word processor and a browser on your souped-up machine, take a look at Ulead Systems' Face Factory. This application uses your processor and graphics board to create zany 3-D faces from two mug shot-style photographs. The program falls somewhat short after that point, however: There aren't (yet) a whole lot of things to do with your

new head. Face Factory has promise; we're hoping the next version will have even more features.



\$40 street; Ulead Systems Inc., 310-523-9393, www.ulead.com.

#### **Rayman Forever**

This challenging package includes three titles: Rayman, Rayman Designer, and Rayman by his Fans. In Rayman, the popular character sets out to save his world from the evil Mr. Dark. The side-scrolling



action game features pleasant scenery and wellrendered graphics. Rayman Designer provides you with the tools to create your own game

levels, and Rayman by his Fans offers the top 40 fan-created levels for your enjoyment. This item is an exceptional value for the price. \$10 street; Ubi Soft Entertainment, 514-490-2000, www.ubisoft.com.

#### **Cyber Grannies**

It's an interesting premise: 26 friendly grandmothers take children through 26 different settings, each corresponding to a letter of the alphabet. In each area, kids learn new words and find educational activities. The instructions are clear and the grannies are cute, but the rooms start getting smaller and less interactive as you proceed through the alphabet. Grandma Xaviera, for example, only has one screen, and the videos in

the V room are a little too complicated for 3-year-olds. \$19.95 street; Kutoka Interactive Inc., 514-849-4800, www .kutoka.com.



#### bleem!

This software-only emulator lets you play Sony PlayStation games on your PC. It is very well supported (with frequent updates) and adds Direct3D acceleration to hundreds of games, making them look better and run faster. There's a downside: The current version doesn't support most new PlayStation games, requires a lot of tweaking to run properly, and didn't work at all with the Pioneer 10X DVD drive on one of our test systems. \$29.95 list; bleem LLC, 323-822-0932, www.bleem.com. III



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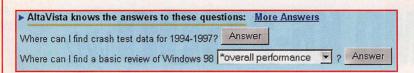
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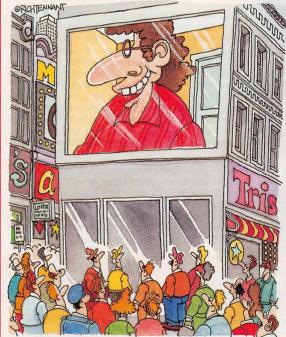
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RELIABLE INTERNET ACCESS SINCE 1943

They must have kept it a wellguarded secret for the first 50 years. (LocalNet ad.)

#### **Daffy Directions**

Faithful reader Mike Arachtingi asked Expedia.com to provide driving directions between the towns of Hastings and Rochester, Minnesota. The results: instructions for a slight detour that would take him to Wisconsin, Ilinois, Indiana, Michigan, Ontario, Quebec, Nova Scotia, and then (via ferry) to Newfoundland, where he would apparently teleport to St. Charles, Minnesota, which isn't where he wanted to go in the first place.



"Hey,Philip! I think we're in. I'm gonna try linking directly to the screen, but gimme a disguise in case it works. I don't want all of New York to know Jerry DeMarco of 14 Queensberry, The Bronx, NY, hacked into the Times Square video screen."

If your entry is used, we'll send you \$50 and a PC Magazine T-shirt. Send your entries to Abort, Retry, Fail?, PC Magazine, 28 E. 28th St., New York, NY 10016-7930 or via e-mail to don\_willmott@zd.com. Winners this issue: Mike Arachtingi, Tim Burgener, Toby Levy, Jeffery Nelson, Ed Siteman, and R.L. Wulffson.

## LET'S SEE, POWER OR CONVENI CONVENIEN POWER?

OH HECK, TAKE ONE SCOOP OF EACH.

DELL INSPIRON | 7500



Inspiron™ 7500 (R500VT) ---PC Magazine's Editor's Choice Award, 10/99

LIFE IS FULL OF TIMES WHEN YOU CAN'T HAVE YOUR CAKE AND EAT IT TOO. THIS ISN'T ONE OF THEM. IN FACT, THERE'S QUITE A BIT OF CAKE HERE. BASICALLY WHAT YOU CAN GET IN THE NEW DELL® INSPIRON™ 7500 NOTEBOOK IS A PENTIUM® III PROCESSOR AND YOUR CHOICE OF A 15 INCH SXGA+ HIGH-RESOLUTION SCREEN, OR A 15.4 INCH SXGA SCREEN — OUR LARGEST YET, AND WITH 4-SPINDLE CAPABILITY, YOU CHOOSE WHICH COMBINATION OF DRIVES WORKS BEST FOR YOU (LIKE YOUR ZIP, CD, AND TWO HARD DRIVES, RUNNING AT THE SAME TIME). SO YOU'LL HAVE ALL THE MULTIMEDIA, MEMORY, SPEED. AND RAW POWER OF MANY FULL-SIZED DESKTOPS IN THIS HANDY TRAVELING SIZE, YES, COMPROMISE IS FOR THOSE WHO CAN'T DECIDE WHAT THEY WANT.

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- 2X AGP 4MB ATI RAGE Mobility™-P 3D Video
- Lithium Ion Battery
- Microsoft® Works Suite with Money Basic
- Microsoft® Windows® 98, Second Edition
- 3-Year Limited Warranty<sup>2</sup>

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Cutting Edge Technology

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- 128MB PC800 RDRAM at 400MHz
- 13.6GB\* Ultra ATA Hard Drive (7200 RPM)
- NEW 17" (16.0" viewable, .28dp) E770 Monitor
- NEW 32MB NVIDIA geFORCE 4X AGP Graphics Card
- 48X Max® Variable CD-ROM Drive
- NEW SB Live! Value Digital with MusicMatch\* Jukebox Enhanced Version<sup>3</sup>
- NEW Harman Kardon HK-595 Surround Sound Speakers with Subwoofer
- NEW Conexant™ V.90 56K Capable<sup>11</sup> Telephony Modem
- 1-Year DelInet<sup>SM</sup> Internet Access<sup>44</sup> with 20MB of Online Backup55

\$2699 Set Nation as \$74/Mo., for 48 Mos. 31 Et Nature CODE: 04221-501226



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Performance, Great Value

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- Yamaha XG 64V Wavetable Sound
- harman/kardon HK-195 Speakers
- V.90 56K Capable<sup>11</sup> PCI DataFax Modem for Windows

\$1299 S As low as \$35/Mo., for 48 Mos. 33 (Mo., for 48 Mos. 33 (Mo., for 48 Mos. 34 Mos. 34 Mos. 35 (Mo., for 48 M

Dell Recommended Upgrade

- NEW SB Live! Value Digital with MusicMatch® Jukebox Enhanced Version38
- Altec Lansing ACS-340 Speakers with Subwoofer
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Affordable Desktop Solution

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- Intel® 3D AGP Graphics
- 40X Max<sup>5</sup> Variable CD-ROM Drive
- SoundBlaster 64V PCI Sound Card with MusicMatch® Jukebox Standard Version38
- harman/kardon HK-195 Speakers
- V.90 56K Capable<sup>11</sup> PCI DataFax Modem for Windows



\$899 SeVALUE CODE: 04221-501208

Dell Recommended Upgrade:

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- NEW 17" (16.0"" viewable, .28dp) E770 Monitor
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#### NEW DELL® INSPIRON™ 7500 Notebook

Mobile Desktop

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- NEW 15 4" SXGA TET Active Matrix Display
- NEW 12GB\* Ultra ATA Hard Drive
- Removable Combo 6X Max<sup>43</sup> Variable DVD-ROM and Floppy Drive with FREE DVD Movie Offer<sup>3</sup>
- 2X AGP 8MB ATI RAGE Mobility™-P 3D Video
- 3D Positional Sound with Wavetable
- Internal PCI 56K Capable<sup>11</sup> V.90 Fax Modem
- MusicMatch® Jukebox Standard Version38
- harman/kardon HK-195 Speakers

\$3699 S As low as \$101/Mo., for 48 Mos.<sup>33</sup> E-VALUE CODE: **04221-801236** 

Dell Recommended Upgrades:

- Intel® PC Camera Pack Pro, add \$129
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- Removable iomega Zip 100MB Drive for MegaBay™, add \$139

#### NEW DELL® INSPIRON™ 7500 Notebook

Mobile Desktop

- NEW Intel® Pentium® III Processor at 450MHz
- 64MB 100MHz SDRAM 15" XGA Active Matrix Display
- 4.8GB<sup>4</sup> Ultra ATA Hard Drive
- Removable Combo 24X Max<sup>7</sup> Variable CD-ROM and Floppy Drive
- 2X AGP 8MB ATI RAGE Mobility M-P 3D Video
- 3D Positional Sound with Wavetable
- Internal PCI 56K Capable<sup>11</sup> V.90 Fax Modem
- MusicMatch® Jukebox Standard Version®

\$2449 Set No., for 48 Mos. 33 Et VALUE CODE: 04221-801224a

Dell Recommended Upgrades:

- Removable Combo 6X Max<sup>43</sup> Variable DVD-ROM and Floppy Drive with FREE DVD Movie Offer37, add \$169
- 6GB<sup>4</sup> Ultra ATA Hard Drive, add \$79
- Removable Combo CD-R/RW with Formatted Media and Floppy Drive, add \$350

#### NEW DELL® INSPIRON™ 3700 Notebook

Light Weight, Light Price

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- 3D Positional Sound with Wavetable
- MusicMatch® Jukebox Standard Version38

\$2249 Servalue CODE: 04221-801222

Dell Recommended Upgrades:

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3269 Susiness Lease<sup>15</sup>; \$109/Mo., 36 Mos.

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- Microsoft\* Windows NT\* Workstation 4.0
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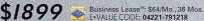
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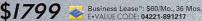


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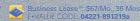
- Intel® Celeron™ Processor at 400MHz 14.1" XGA Active Matrix Display
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- Modular 24X Max<sup>†</sup> Variable CD-ROM and Floppy Drive
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- Lithium Ion Battery
- Microsoft\* Works Suite with Money Basic
- Microsoft\* Windows\* 98, Second Edition
- 3-Year Limited Warranty<sup>2</sup>



- Upgrade to Intel® Pentium® II Processor at 400MHz, add \$300
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- 16MB AGP Graphics Card, 48X Max<sup>16</sup> Variable CD-ROM
- 320V Sound Card and Speakers
- Microsoft® Windows® 98 and Office 2000 Small Business
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