



Something New For the Home



PC Labs Tests Four of The Hottest New PCs

- ▶ 24 Printers for Business Color
- ▶ Multiplayer Gaming Knows No Bounds

MS INTERNET Explorer vs. NETSCAPE Navigator

ENGINEERING LIBRARY
 DISPLAY PERIODICAL
 Non-circulating until:
 NOV 13 1996

PC Labs Tests Reveal The Real Winner

#BXBHFGD****CAR-RT SORT**C000
 HLWSH000081 9#740200 1Q
 UNIV OF WASHINGTON JUN 08 99
 LIBS-FM25 DUSA
 SERIALS DIV-COPY ONE #8018
 SEATTLE WA 98195-0001

UP FRONT

Inside
Just-in-time reviews 4

Letters
Computing Java 19

Trends
▶ Power paging
▶ LCDs on your desktop
▶ Combatting Internet-borne viruses
▶ A Netscape spinoff 31

Pipeline
Identifying suck-ups, and other management secrets 37

First Looks
▶ Net2Phone
▶ FloorPlan Plus 3D
▶ Web search engines: Excite and HotBot
▶ Domino Web server
▶ Tally T7070 ink jet printer
▶ EchoSearch 39



The latest in home PCs: Style, performance, and a little television (page 39).

Second Looks
A kinder, gentler PointCast 73

COLUMNISTS

Michael J. Miller
From the Editor-in-Chief 29

Bill Machrone
The End of Common Experience 85

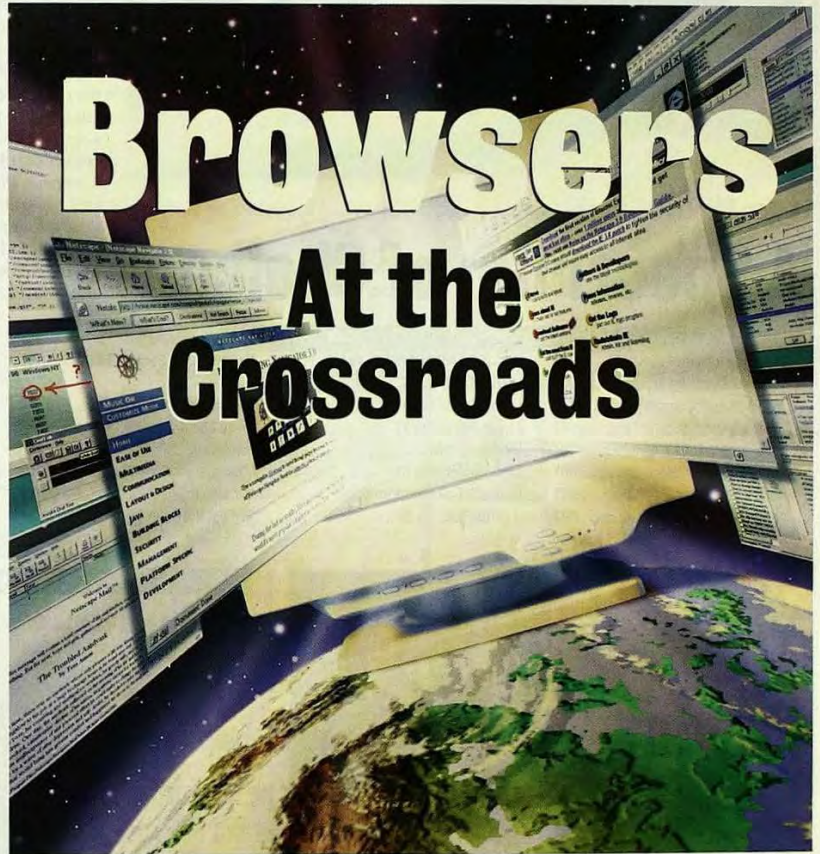
John C. Dvorak
The Digital-TV Disaster 87
Inside Track 89

Jim Seymour
Windows NT Revisited 93

Bill Howard
PC Banking Benefits 95

COVER STORY

Netscape Navigator vs. MS Internet Explorer



BY MICHAEL J. MILLER, THOMAS MACE, AND AMARENDRA SINGH Out of the scores of browsers available today, only two really matter: Microsoft Internet Explorer 3.0 and Netscape Navigator 3.0. Which browser is the easiest and most flexible to use? Which performs the fastest on a network and over modems? Which offers the best text rendering and the richest programming features? Which one should you choose? Our tests provide an in-depth analysis of the browser, mail, news, and collaboration features of both hot new releases 100

| | | |
|-----------------------------|-------------------------------|-------------------------------|
| Editors' Choice 103 | Browser Generation 108 | Performance Tests 129 |
| End-User Features 105 | Webmaster Features 112 | Collaboration Tools 130 |
| Due This Fall: The Next | Developer Platforms 119 | Mail and News 139 |

FEATURES



Color Printers

A Spectrum of Choices

BY M. DAVID STONE Colorful documents have gained popularity in everyday business use. Presentations and reports make a better impression in color, and graphic arts professionals can now produce handsome color comps at a lower cost. In this feature we look at the range of color business printers with image quality and speed to suit any office or graphics activity. The ten color laser printers we review deliver the clear text business users have come to expect, with color to make dazzling reports and presentations. For the graphics pro, we review four ink jet and eight thermal dye transfer models designed to deliver striking, near-photographic output for color image proofs and artwork141

| | | | | | | | |
|------------------------------------|-----|--------------------------------|-----|------------------------------------|-----|---|-----|
| LASER PRINTERS | 150 | Xerox XPrint Plus 4920..... | 177 | Tektronix Phaser 240..... | 186 | Tektronix Phaser 440, 480X | 195 |
| Digital Colorwriter LSR 2000 | 150 | INK JET AND THERMAL WAX | | THERMAL DYE PRINTERS | 187 | A Color Printer for Every Need | 142 |
| HP Color LaserJet 5M..... | 150 | PRINTERS | 179 | Eastman Kodak | | Editors' Choice | 143 |
| IBM Network Color Printer..... | 162 | Epson Stylus 1500..... | 179 | Digital Science 8650 PS | 187 | Glossary | 146 |
| Lexmark Optra C..... | 167 | Epson Stylus Pro XL..... | 179 | Fargo Electronics Pictura 310e ... | 188 | Guide to Color Output | 154 |
| QMS magicolor CX/40..... | 167 | HP CopyJet M..... | 182 | Fargo PrimeraPro..... | 188 | Performance Tests | 170 |
| QMS magicolor WX..... | 167 | HP DeskJet 1600 CM..... | 182 | Mitsubishi S3600-40U | 192 | Summary of Features | 182 |
| Tektronix Phaser 350, 550..... | 175 | Lexmark Color Jetprinter | | Mitsubishi S6600-40U | 192 | Shinko ColorStreams: | |
| Xerox XPrint Plus 4915..... | 177 | 4079 Plus..... | 183 | Seiko ColorPoint 835 PS | 195 | Two More Contenders | 188 |

Application Servers

The Power Of Four



BY BILL KATZ Quad-processor Pentium Pro-powered servers have arrived, and they're ready to take on the enterprise, formerly a space dominated by \$100,000+ RISC boxes running Unix. These servers have all the necessary hardware to run in an upscale, demanding enterprise environment, including an abundance of hot-swappable and redundant components as well as voluminous memory and disk capacities. They're also highly manageable, with hardware and software solutions designed to keep them up and running whether you're close to your server room or miles away. We test eight four-way Pentium Pro application servers running Windows NT Server 3.51 with our industry-standard test suite ServerBench 3.0197

| | | | |
|------------------------------|-----|--------------------------------------|-----|
| ALR Inc. | 199 | Editors' Choice | 199 |
| Austin Direct | 202 | Suitability to Task | 200 |
| Compaq Computer Corp. | 215 | Price/Performance Index | 202 |
| Data General Corp. | 216 | Sharing the Wealth | 207 |
| Digital Equipment Corp. | 216 | Solutions for Managing | |
| Hewlett-Packard Co. | 223 | Your Server | 212 |
| NEC | 226 | Performance Tests | 218 |
| Unisys PC Division..... | 227 | Summary of Features | 224 |

AT HOME

Multiplayer Gaming



Two or More Is War

BY MICHAEL E. RYAN Want to learn more about the Internet's killer app? Then be sure to check out our roundup of online gaming services. We cover four that let you play the hottest action and strategy games against foes in your area and around the country. We also take a close look at multiplayer gaming over LANs and its effect on network traffic. Grab your shotgun and load up on atomic health—you're not going to want to miss this!.....337

| | | | |
|---------------------|-----|------------------------------------|-----|
| DWANGO | 339 | Online Fun for Kids | 343 |
| Kali..... | 343 | The Local Multiplayer | |
| Mplayer..... | 350 | Connection | 346 |
| Total Entertainment | | Free Net Gaming? | 353 |
| Network..... | 356 | In the On-Deck Circle | 356 |

PC TECH

Java Speed Trials

BY RICHARD V. DRAGAN AND LARRY SELTZER
Our Java performance test suite JMark 1.0 reveals the strengths and flaws of today's Java environments. Find out whose virtual machine and just-in-time compiler executes Java applets fastest.....229

Tutor

BY JEFF PROSISE From Easter eggs to system monitor: A mixed bag of topics prompted by you, the reader.....239

Inside Windows 95

BY BARRY SIMON Let Windows answer the phone: Voice-enabled modems, TAPI, and SVD promise powerful telephony.....241

Internet Tools

BY NEIL RANDALL A look at HTTP—the protocol that drives the World Wide Web....245

Utilities

BY DOUGLAS BOLING Power to the right click! MenuEdit makes customizing context menus a snap.....249

PC SOLUTIONS

User-to-User

BY NEIL J. RUBENKING Dropping files on a .BAT file in Windows 95; adding a rooted Explorer view choice to folders' context menus.....253

ASK OUR ADVISORS

Hardware

Why a monitor may be turning itself off; running a Windows system with a CGA monitor; what to do when a new case disables your computer.....264

Operating Environments

Setting a default font for Write in Windows 3.1; adding external viewers to OS/2 Warp's WebExplorer; processing environment variables in a FOR loop.....269

Word Processing

Why your WordPerfect files containing graphics double in size each time you update them—and how to avoid this...272

Spreadsheets

Why entries ending in the letter E may not work the way you'd expect in 1-2-3 for Windows.....276

Databases

Toggle between U.S. ZIP codes and Canadian postal codes in your Microsoft Access forms; making sure the date format fits your FoxPro application.....276

ALSO IN THIS ISSUE

PC Direct.....253
 PC Magazine Marketplace.....298
 Premier.....298
 Classified.....319
 BusinessCard.....334
 Reader Service Card.....315
 Advertisers' Index: Companies.....361
 Advertisers' Index: Products.....362
 Coming Up.....364
 Editorial Product Index.....365

A strange solicitation arrives in the daily mail (page 366).

AFTER HOURS

Abort, Retry, Fail?

BY DON WILLMOTT.....366



PC MAGAZINE BEYOND PRINT



WWW.PCMAG.COM



WHAT'S NEW ONLINE

With all the Internet-related software available on the Web, it's sometimes difficult to decide what you really need. Nothing is more frustrating than to spend 20 minutes or so downloading a plug-in that doesn't do what you thought it would. Here's the solution. Visit InternetUser and find out about the latest browsers, plug-ins, Internet utilities, and development tools before you download. To make it easier for you to find and read hundreds of reviews of the latest Internet tools, we've entirely redesigned InternetUser. To tell us what you think about InternetUser, send a message to Tin Albano at talbano@zd.com.

WHAT'S NEW ON THE CD

Pentium Classic: Still the One
 Interactive reviews of over 100 Pentium machines, from 120- to 166-MHz CPUs.

Create Your Own Web Site
 Everything you need to create a Web site, from HTML authoring software to database tools to servers.

Portable Property
 Full-motion videos and customizable charts help you select the right notebook.

Adapting to Online
 See how online services embrace and complement the Web using our video reviews.

Gamer's Guide
 Video reviews of the 25 hottest PC games in four categories.

Utilities and software: MultiLaunch associates more than one application with a file extension, Hotkey Detective lists hotkeys in use, InCtrl 3 lets you track system changes, RUPL adds programs to your Windows 95 Start menu, and Quod tests your gaming strategy.

A full year of PC Magazine in searchable format.

To order, call 800-335-1195 in the U.S. and Canada or 303-665-8930 elsewhere.





Editor-in-Chief Michael J. Miller

Editor Jake Kirchner

Executive Editors Rick Ayre, Bill Howard, Gail Shaffer, Don Willmott

Executive Director, PC Labs C. James Galley III Art Director Laura Baez

Senior Networking Editor Frank J. Derfler, Jr.

Senior Editors Leon Erlanger (Networking and Communications), Thomas Mace (Internet, PC Tech), Brian Nadel (First Looks), Sebastian Rupley (West Coast)

Managing Editor Paul B. Ross Research Manager Judy DeYoung

Senior Associate Editors Carol Levin (Trends), Sharon Terdeman (Technical Columns), Lance N. Ulanoff (Software) Associate Editors Jamie M. Bsales (Hardware), Michael E. Kim (After Hours), Todd Spangler (Networking and Communications), Carol Venezia (PCs) Assistant Managing Editor Ryan Schueller Production Editor Monica Sirignano Copy Chief Glen Boisseau Becker Staff Editors Holly Aguirre, Mary E. Behr, Yvonne Koulouthros, David R. Lambert, David Lidsky, Elynn J. McCasland, John Morris, Michael W. Machrone, Melissa J. Perenson, Sarah L. Roberts, Michelle Schoening, Anush Yeggyazarian Senior Writer Robert S. Anthony Staff Writers Angela Hickman, Cade Metz Senior Copy Editor Joseph N. Levine Copy Editors Jennifer Gohly, Regina Y. Kwon, Jill Léger, Gerard Mackey, Josh Miller, Ann Ovodov Production Manager Patricia Perkowski Layout Analyst Nancy Goodman-Slayback Librarian Nancy Sirapyan Library Assistant Dolores Williams Editorial Researchers Jennifer Anderson, Andrew Boscardin, Robert Daly, Simon T. Eskow, Josh Levy, Arie Moller, Jeremy Olshan, Eyal Rabinovitch, Richard S. Shim Editorial Assistants Laura Lindhe, Mary Paulson System Support Manager Craig Ellison Network Support Analyst Melvin Acevedo Communications Manager Diana Garelik Assistant to the Editor-in-Chief Tara Solon Assistant to the Editor Rita Aprahamian Assistant to the Executive Editors Christina M. Evelyn Administrative Assistant Christina Okang Sypoor, PC MagNet Ken Hipple

Contributing Technical Editor Neil J. Rubenking Contributing Editors Bill Machrone (Editorial Director, New Products), Douglas Boling, Padraic Boyle, Bruce Brown, Brian Butler, Cheryl Canter, Ray Duncan, John C. Dvorak, Michael J. Mefford, Edward Mendelson, Charles Petzold, Stephen W. Plain, Tony Pomplii, Alfred Poor, Jeff Prossie, John R. Quain, Sal Ricciardi, Steve Rigney, Winn L. Rosch, Joe Salemi, Jim Seymour, Richard Hale Shaw, Barry Simon, Luisa Simone, Craig Stinson, M. David Stone

Senior Associate Art Director Richard Demler Associate Art Directors Charles Conover, Vera Naughton, Michael Scowden Assistant Art Director Le Chau (Betty) Thu Associate Graphics Director David Foster Graphic Artist Mark Tyner Assistant to the Art Director Frieda T. Smallwood Contributing Photographer Thom O'Connor

Director, PC Labs, West Coast Steve Buehler Technical Directors Ben Z. Gottesman (Software), Nick Stam (Hardware), Larry Seltzer (Internet, PC Tech) Director, Operations John R. Delaney Project Leaders Richard Fisco (PCs), Jeff Mace (Graphics/Hardware), Jay Munro (Internet, PC Tech), Robert Norton (Network Edition), Jeffrey G. Witt (Networking and Communications) Associate Project Leaders Laura Cox, Dan Smith Programmers Richard V. Dragan, Kenneth Prakobchari Product Testing Manager Charles Rodriguez Technical Analysts Russell Iwanchuk, Amy Leung, Margaret A. Piemonte, Rick Rovengo, Denis Tom Support Technicians Bruce Deodat, Andrew Go, Oliver Khan, William Lopez, Jacqueline Paredes, Mark Valente, Kevin Young Inventory Control Coordinators Bryan Hughes, Rob Graydon, Melanio Pagan

PC MAGAZINE CD

Executive Editor Peter McKie Art Director Curtis M. Fields Associate Editor Jae Yang

PC MAGAZINE ONLINE

Managing Editor Diane D'Angelo Web Designer Albert Larew Associate Editor Tin Albano Senior Technical Editors John Clyman, Amarendra Singh Technical Associate Thomas W. Giebel Staff Writer Karen J. Bannan Assistant Editor Tracy Reppert

Publisher Nancy Newman

National Associate Publisher Peter Longo National Sales Director Vickie Pinsky Business Manager Andrew J. Cole Business Analyst Christine Holsten Events Manager Dawn Gudeles Manager, Promotion and Public Relations Lynne Hasluck

Senior Advertising Production Manager Susan Conrad Advertising Production Manager Robert Joy Assistant Advertising Production Managers Barbara Adams, Ivis Fundichely Editorial Production Manager Pamela J. Berkowitz Coordinator, Editorial Production Louise Laberge

Advertising Office: One Park Ave., New York, NY 10016-5802; 800 33 MAG AD, 212-503-5100

Ziff-Davis Publishing Company

Chairman and CEO Eric Hippeau

Presidents Ronni Sonnenberg (U.S. Publications), Jeffrey Ballowe (Interactive Media and Development Group), J.B. Holston III (International Media Group), Bob Brown (Computer Intelligence/Infocorp), William Rosenthal (Training and Support Publishing Group) Vice-Presidents Timothy O'Brien (Chief Financial Officer), J. Malcolm Morris (General Counsel and Secretary), Rayna Brown (Human Resources), Daryl R. Otte (Planning), Roger Herrmann (Production), Mark Meyer (Controller) Treasurer Thomas L. Wright

U.S. Publications Group

Presidents Ronni Sonnenberg (U.S. Publications), Claude Sheer (Business Media Group), J. Scott Briggs (Consumer Media Group) Senior Vice-Presidents Lawrence C. Burstein (Consumer Advertising), Baird Davis (Circulation) Executive Vice-President, Business Media Group Don Byrnes Vice-Presidents Tom McGrade (Business Manager), Jim Manning (Marketing Services), Bob Bader (Central Advertising Sales), Mark Van Name (Product Testing), James F. Ramaley (Circulation Services), Al DiGuido (Group Publisher), Daniel Farber, Michael J. Miller, Paul Somers Executive Director, Licensing Gertrud Borchardt Director, ZD Labs Bob Kane Director, Benchmark Operation Bill Catchings Ziff-Davis Magazine Network: Vice-President/Managing Director Joe Gillespie Executive Director Alicia Saribalis Marketing Director Mike Perkowski Directors Ken Beach, Michael Bird, Jeff Bruce, Kelly Lowman, Melinda Maginn, Debbie Moss, Julie Tuttle

Interactive Media and Development Group

President Jeffrey Ballowe Executive Vice-President David Shnaider Executive Vice-President, Internet Publishing Group Daniel Rosenzweig Vice-President, Business Development Tom Thompson Vice-President, Editor-in-Chief ZD Net Daniel Farber Vice-President, General Manager ZD Net James Savage Vice-President, ZDTV Richard Fisher Vice-President, Creative Services Herbert Stern Vice-President, Research Elda Vela Editorial Director, New Products Bill Machrone Group Business Manager Jocelyn Grayson Director, Public Relations Gregory Jarboe

Ziff-Davis Publishing Company

A Softbank Company

Subscription Inquiries, Address Changes

Subscription Services: For subscription service questions, address changes, or ordering information, call 303-665-8930 in the U.S., 303-665-8930 in Canada, or 303-604-7445 elsewhere. You can send faxes to 303-604-7455, or 303-604-0540 outside the U.S. Or write to PC Magazine, P.O. Box 54093, Boulder, CO 80322-4093.

Subscription Rate: The subscription rate is \$49.97 for a one-year subscription (22 issues). Canada and all other countries, please add \$36.00 for postage.

Back Issues: For back issues (subject to availability), \$8 per issue (\$9 outside the U.S.), send check or money order to Back Issues Dept., Ziff-Davis Publishing Company, P.O. Box 53131, Boulder, CO 80322-3131.

PC Magazine CD: PC Magazine CD, the interactive CD-ROM companion to PC Magazine, is available quarterly. To order (\$49.95 per year in the U.S., \$72 in Canada, \$99 elsewhere), please call 800-335-1195, or 303-665-8930 outside the U.S. and Canada. Or write to PC Magazine CD, P.O. Box 59494, Boulder, CO 80322-9494.

Customer Lists: We periodically make lists of our customers available to carefully screened mailers of quality goods and services. If you do not wish to receive such mailings, please write to us at PC Magazine, P.O. Box 54093, Boulder, CO 80322-4093.

BuyerLink: Additional information on advertised products can be requested online at www.pcmag.com/BuyerLink.

How to Contact the Editors

We welcome letters. However, we cannot look up stories from past issues, recommend products, or diagnose problems with your PC by phone. Send your written questions, complaints, and compliments to PC Magazine, One Park Ave., New York, NY 10016-5802. Please include a daytime telephone number. Send electronic mail to CompuServe address 72241,104, to Internet address pcmag@zid.com, or to PC MagNet (see below). PC Magazine's general number is 212-503-5255. The West Coast Operations number is 415-378-5500.

If you are dissatisfied with a product advertised in PC Magazine and cannot resolve the problem with the vendor, write (do not call) Beatrice Olivas, Advertising Department, at the above address. Include copies of your correspondence with the vendor.

PC Magazine does not accept unsolicited manuscripts. We will pay \$50 for Solutions and Programming user tips and for Abort, Retry, Fail? submissions. If you submit artwork or clippings with "Abort, Retry, Fail?", mark up a photocopy, not the original.

PC Magazine Online



PC Magazine is on the World Wide Web (www.pcmag.com) and The Microsoft Network (Go To pcmag.com), and it operates PC MagNet, an on-line service of ZD Net, hosted by CompuServe. To join PC MagNet, call 1-800-895-4596 and ask for the PMZ offer, or set your communications software for 7 data bits, even parity, 1 stop bit, and full duplex. To find the number nearest you, dial 800-346-3247. (In Canada, dial 800-635-6225, voice only.) At the Host Name prompt, enter PHONES. Follow the menus, note the number closest to you, then hang up and dial the number. At the HOST NAME prompt, enter CIS. At the USER ID prompt, enter 177000,5000. Enter PCMAGNET at the PASSWORD prompt and PCMCISOS at the ENTER AGREEMENT NUMBER prompt. When you join ZD Net, you will be enrolled in both ZD Net and CompuServe, for a charge of \$13.45 a month. The connect-time charge is \$2.95 an hour, billed by the minute. For member services, call 800-848-8990.

To obtain the current utility on PC MagNet, type GO ZNT: FREEUTIL. You can also obtain it from our World Wide Web site, or you can download it from our anonymous FTP server at ftp.pcmag.zid.com. You can receive the free utility on-disk by faxing your request to 508-368-0141.

Permissions, Reprints

Material in this publication may not be reproduced in any form without permission. If you want to quote from an article or use PC Magazine's logo in conjunction with an Editors' Choice designation, write Chantal Tucker or fax her at 212-503-5475; for information on reprints, please contact Ziff-Davis Reprints at 800-825-4237.

Editorial and Business Office: One Park Ave., New York, NY 10016-5802. Editorial: 212-903-5255, Advertising: 800 33 MAG AD, 212-503-5100.

The following are registered trademarks of Ziff-Davis Publishing Company: DDS/Mag, NetBench, PC, PC DIRECT, PC Labs, PC MAGAZINE, PC MAGAZINE AWARD FOR TECHNICAL EXCELLENCE, PC MAGAZINE EDITORS' CHOICE, PC MagNet, ServerBench, WinBench, Winstone, and ZD.

The following are trademarks of Ziff-Davis Publishing Company: Abort, Retry, Fail?, After Hours, BusinessCard, Corporate Data Plus, Lab Notes, New & Improved, OFF THE STACK, PC Bench, PC Magazine At Home, PC Magazine CD, PC Magazine Marketplace, PC Solutions, PC Tech, Pipeline, Power Programming, Quick Clips, Read Only, ScreenDemos, Tech Notes, Tutor, User-to-User, WinDrain, Zdigit, ZD Net, and ZDNet.

Other trademarks and trade names used throughout the publication are the property of their respective owners.

Except where noted, all PC Magazine reviews are of currently available products.

Copyright (c) 1996 Ziff-Davis Publishing Company. All rights reserved. Reproduction in whole or in part without permission is prohibited.

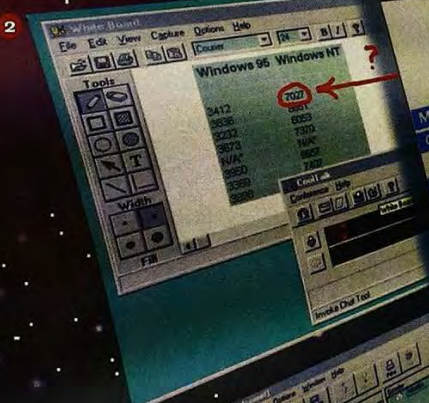
BROWSERS

By Michael J. Miller, Thomas M. ... and Amarendra Singh

```

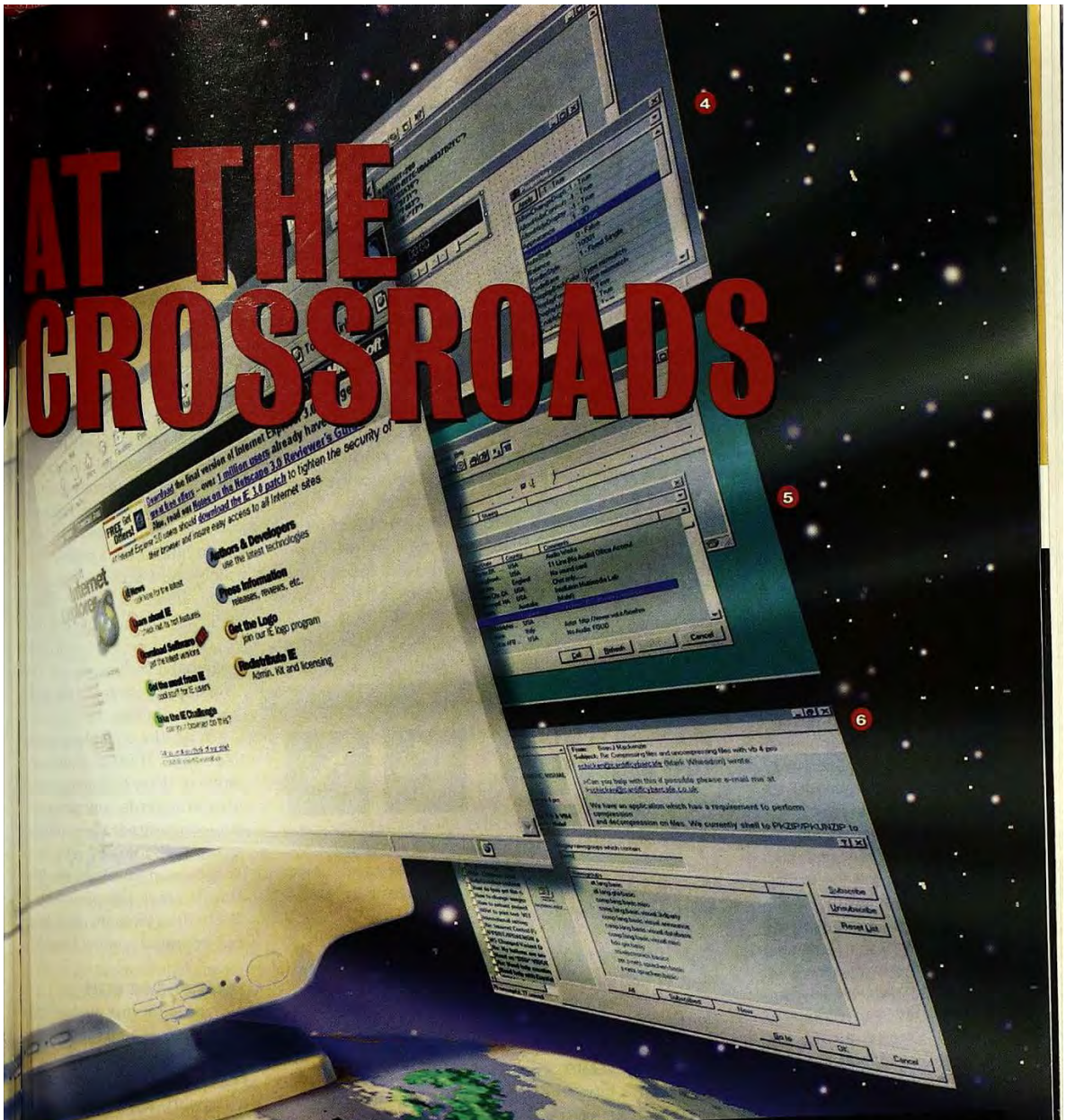
1 <!--
  iz( top.frames.length )
  {
  var blank1 = 1;
  var blank2 = 0;
  stuff2 = new parent.other( "i.gif", "1" );
  frame2[ 0 ] = new parent.makesrey( stuff2, iz( 1 ) );
  frame2[ 1 ] = new parent.listing( "/csseset/ind" );
  frame2[ 2 ] = new parent.listing( "/comcoo/ind" );
  frame2[ 3 ] = new parent.listing( "http://bescha" );
  frame2[ 4 ] = new parent.listing( "/main/ind" );
  frame2[ 5 ] = new parent.listing( "/comment/ind" );
  var blank1 = 0;
  stuff1 = new parent.other( "home.gif", "1" );
  </--
  </pre>

```



- 1 The Navigator platform sets the standard for scripting, plug-ins, Java, and browser programmability.
- 2 Navigator's whiteboard and Internet phone let remote conferees sketch things out over the Internet.
- 3 Netscape Mail underscores the importance of e-mail, the Internet's biggest application.
- 4 ActiveX development brings a powerful new programming standard to the Web.
- 5 Mail and news clients are recent additions to Microsoft's browser.
- 6 Internet phones and application sharing are high points of Internet Explorer 3.0's strong collaboration tools.

AT THE CROSSROADS



Netscape Navigator 3.0 defines the browser. Microsoft Internet Explorer 3.0 clones its features and adds significant new technology. The winner will dictate the future of the Web.

The battle of the browsers has quickly come down to a duel. Of the 30 products covered in our last Web browser review ("Just Browsing," March 12, 1996), only two seem to matter anymore. Netscape Navigator remains the overwhelming market leader, the product most people think of as synonymous with Web browsing. It defines the Web's de facto standards for HyperText Markup Language (HTML), graphics, plug-ins, Java, and scripting. Almost all Web content that isn't vanilla is flavored for use with Navigator. The latest release, Navigator 3.0, adds collaboration features,

ILLUSTRATION BY TOM WHITE



Join Us Online
as PC Magazine editors
and representatives from
Microsoft and Netscape answer
your questions about the current
and future state of browsers.
.....
WWW.PCMAG.COM

multimedia, VRML support, and improved Internet mail and news.

Microsoft Internet Explorer 3.0 is the first version of Microsoft's browser that is truly competitive. The new Windows 95 and Windows NT releases not only match up well with Netscape's HTML, plug-ins, Java environment, and scripting standards; they also add support for ActiveX, a technology for bringing Windows-style applications to the Web. Internet Explorer also matches or exceeds Netscape's offerings in collaboration tools, multimedia, VRML, mail, and news. Microsoft is giving its browser and development tools away for free (Netscape Navigator sells for \$49) and has concluded aggressive bundling deals with several of the largest online services and Internet service providers. Today, Internet Explorer's market share hovers around 10 percent, but it is sure to grow.

Which browser should you use? The choice may seem trivial, but it has enormous implications. The company that dominates the browser market will dictate online standards and change the way we use the Web.

To help you choose—and understand the implications of your choice—we provide in-depth analyses of both browsers from the perspectives of the end user, the Webmaster, and the applications developer. We also look at the performance of each browser's HTML- and graphics-rendering engine, test each browser's collaboration tools, and compare the pair's respective mail and news features. A companion piece in this issue, "Java Speed Trials," gives detailed test results involving both browsers' Java environments.

Given that Internet Ex-

IN THIS STORY

| | |
|---------------------------|-----|
| End-User Features | 105 |
| Webmaster Features | 112 |
| Developer Platforms | 119 |
| Performance Tests | 129 |
| Collaboration Tools | 130 |
| Mail and News | 139 |

plorer comes out ahead in many of these comparisons, you may be surprised that Netscape Navigator is our Editors' Choice. Our decision rests on the fact that Navigator is still the best tool for accessing the huge number of Navigator-enhanced sites on today's Web. Internet Explorer is in many ways a technically superior product, however, and Netscape will have to work hard to keep its lead. Neither browser displays the kind of rock-solid stability we expect from other software, a legacy of the frantic pace of Web development. While we will see incremental upgrades to the current versions, both vendors are al-

ready working on their next major releases, expected as early as this fall.

IT'S A NETSCAPE WEB

In theory, the Web is based on open standards. In practice, an enormous amount of Web content is tailored to leverage proprietary features in Netscape Navigator browsers. These features cover almost every aspect of content delivery.

Netscape extensions to HTML are widely used by page designers who want better formatting control and more display options than what vanilla HTML provides. Plug-ins, another important Netscape standard, give vendors a way to add almost any conceivable functionality to the Navigator browser—everything from streaming audio broadcasts to multimedia. JavaScript, Netscape's widely used scripting language, gives Web developers a way to embed small but highly useful programs into their pages. JavaScript can be used to manipulate programmable elements of the

Netscape browser and the documents it displays.

With the exception of the Netscape HTML extensions, none of these technologies are true standards, and many are undocumented. These proprietary technologies give Netscape enormous leverage, letting it steer the direction of Web development and lock out potential competitors.

MICROSOFT: CLONE MAKER

No company has understood the power of Netscape's "monopoly" better than Microsoft. (Cynics might observe that Microsoft has long enjoyed comparable control over the Windows platform.) Rather than fighting established standards, Microsoft Internet Explorer 3.0 offers a clone of the Netscape platform. It provides a plug-in runtime environment, supports JavaScript (which Microsoft calls JScript), and exposes the equivalent of Navigator Objects.

Unfortunately, the clone is

WEB BROWSERS

BROWSER FEATURES THAT DRIVE THE WEB



WEB NAVIGATION has only gotten easier, thanks to both browsers' clean interface design. Internet Explorer comes out ahead on interface customization, while Netscape Navigator offers better options for low-bandwidth users.

HTML standards drive the look of the Web. Internet Explorer's adoption of the powerful Cascading Style Sheets Level 1 standard will give Webmasters typographic control they've never had before, but Netscape Navigator is the faster of the two at actually rendering pages.

VIRTUAL REALITY, in the form of VRML, is available through both browsers. Both also support in-line audio. Internet Explorer goes one step further with ActiveMovie, a native video playback module that handles multiple formats.

JAVA AND PLUG-INS remain the accepted standards for extending browser functionality. Both browsers support them, although Internet Explorer's plug-in support is less than perfect. Microsoft's ActiveX technology is a powerful alternative.

COLLABORATION TOOLS, including an Internet telephone, remote whiteboard, and chat, are standard features of both browsers. Internet Explorer also offers application sharing, a powerful feature for linking remote coworkers.

Editors' Choice

• Netscape Navigator 3.0



The true winner of the browser wars is the one who uses both Netscape Navigator 3.0 and Microsoft Internet

Explorer 3.0 to access the Web. Together, these tools will give you far more of the Internet than either one can alone. But if you're limited to a single browser, Netscape Navigator 3.0, the world's most popular and influential browser application, is still the best choice. Too many Web sites are optimized for Navigator plug-ins and JavaScript features that Internet Explorer, Navigator's only real competitor, does not yet fully support.

Navigator 3.0's platform-independent philosophy has taken it to important host environments including Macintosh and Unix—places where Internet Explorer 3.0 has yet to go. Navigator's newly introduced LiveConnect standard, which integrates Java, JavaScript, and plug-ins, will be particularly attractive to Web developers who want to reach the largest possible audience on all platforms. Its topflight HTML-rendering performance and flexible options for low-bandwidth use deliver your pages more quickly at all connection speeds.

not 100 percent compatible. A few plug-ins (mostly obscure ones) don't work, some JavaScript pages break, and a handful of objects are unsupported. We expect Microsoft will fix these problems soon. But until then, it's hard to recommend Internet Explorer as your sole browser.

Internet Explorer also offers more than its share of original new technology. Most of this, too, is proprietary, although it's arguably better documented and more accessible to third parties than what Netscape offers. The most significant new technology is ActiveX, a direct descendant of Microsoft's OCX control standard that is ultimately based on Microsoft's Component Object Model (COM). ActiveX is currently a 32-bit Windows-only affair, although Microsoft is porting it to Unix and the Mac. There are already about 1,000 ActiveX controls on the market, and the standard is already widely supported by third-party programming tools.

ActiveX competes with both plug-ins and Java in the sense that it can be downloaded on the fly to add rich functionality to the browser. It is also complementary with both in that ActiveX, Java, and plug-ins can be used within Internet Explorer as components to build total solutions. Used in

conjunction with JScript or Visual Basic Scripting Editor (VBScript), ActiveX technology makes it possible to develop highly complex Web applications quickly and easily. It is unlikely to be widely adopted on the Web until Internet Explorer achieves a significant market share. But for intranet developers (in 32-bit Windows environments), this represents a very compelling approach.

Both browsers support Java applets and provide Java just-in-time (JIT) compilers for accelerating Java execution. This support cements Java's position as a central Web development tool. Overall, Microsoft's Java environment is more stable and far faster than Netscape's.

WEB COLLABORATION

Both Internet Explorer and Navigator include tool suites designed to let workgroups collaborate across the Internet. Although these tools are relatively basic, this is a striking trend. Both browsers include

Navigator still has a hard fight ahead to stay number one. Needed improvements we hope to see in the near future include support for rich style sheets, better stability and speed in its Java environment, and a substantially beefed-up collaboration suite.

Internet Explorer 3.0 will wake up anyone who still doubts Microsoft's commitment to the Web. In just over a year, the company has transformed Internet Explorer from a flimsy me-too affair into a solidly engineered platform for cutting-edge Web content and applications.

End users will enjoy Internet Explorer's highly customizable user interface, easy navigation features, and powerful collaboration tools. Webmasters will appreciate its strong HTML implementation and welcome its pioneering adoption of HTML Cascading Style Sheets, a powerful feature based on a proposed W3C standard that brings basic typographic control to page design for the first time.

Developers in 32-bit Windows environments will welcome the ease and power of ActiveX, an OLE-based standard already widely supported by third-party control and tool vendors. Microsoft's integration of Java, JavaScript, and plug-ins into the ActiveX model is particularly impressive. Java developers will welcome Internet Explorer's well-tuned Java virtual machine, the fastest currently available.

The strikes against Internet Explorer are incompatibilities in its plug-in and JavaScript support and the fact that Windows 3.x, Macintosh, and Unix users are left out in the cold. When Microsoft remedies these deficiencies—and it has committed itself to doing so—Internet Explorer will be a tough browser to beat.

point-to-point Internet telephones, which let you talk to other users anywhere in the world over an Internet connection (and without long-distance charges). They also offer whiteboard modules for free-form group brainstorming and text-based chat modules for real-time group discussions. Internet Explorer's collaboration suite also includes a powerful remote application-sharing feature that lets co-workers view and coedit documents in any Windows application in real time across the Internet.

Both browsers include mail and Usenet news clients as well. These applications aren't exactly knockouts, but all are functional and will get you started with these core Internet applications.

As competition between Microsoft and Netscape heats up, one certainty is that each vendor sees its browser as the key to implementing its vision for the Web. The contest to deliver the fastest, richest, most stable, and most compatible browser can only benefit Web users.

Our Contributors: MICHAEL J. MILLER is editor-in-chief of *PC Magazine*. JOHN CLYMAN and AMARENDRA SINGH are senior technical editors at PC Magazine Online. LARRY SELTZER is a technical director at PC Magazine Labs. JAN OZER is president of Doceo Publishing, a developer of digital video testing tools. THOMAS MACE was the senior editor in charge of this story, and JAY MUNRO was the project leader.

Increase Your Scanner's Accuracy*



*"Accuracy at a cost that can't be beat."
— Home PC
— June 1996
Editor's
Choice*

X Imagine finding professional OCR scanning software that can handle documents containing multiple columns, pictures or cell tables with ease. Xerox' full-featured TextBridge Pro 96 will not only save you from retyping your documents, but the hassle of reformatting them as well.

TextBridge Pro 96 provides exceptional accuracy on various document types including magazines, dot matrix, faxes and photocopies. Newspaper columns with pictures are output as if you retyped them yourself — all at the touch of one button.

Scan to the Web

Now take your scanned in documents and convert them into HTML files. TextBridge Pro 96 includes SoftQuad's HoTMetal light 2.0, giving you an easy-to-use, one step solution for scanning, recognizing and



Upgrade to TextBridge Pro 96 from any OCR software for only

\$129*

- ▼ Increased Accuracy
- ▼ Free HTML editor
- ▼ Duplicates original page layout
- ▼ Save over \$200
- ▼ Win 95, NT, 5.1 on same CD

Designed for Microsoft Windows 95

editing paper-based information bound for the World Wide Web. It can even help you build your Intranet.

And that's not all, TextBridge Pro 96 is backed by the Xerox Satisfaction Guarantee which includes unlimited toll free support*, plus a thirty day risk-free offer.

To learn more call us, visit our Web site, or see us on CompuServe at Go TextBridge. We'll help you dramatically increase the accuracy of your scanner, with TextBridge Pro 96.

To order call:
1-800-248-6550, ext. 3

Visit our Web site:
www.xerox.com/products/tbpro

THE DOCUMENT COMPANY
XEROX

In Canada 1-800-275-9376



*For registered users. *Manufacturer's suggested retail price. No proof of purchase required. Actual price may vary. Xerox® The Document Company®, the stylized X, and TextBridge® are trademarks of Xerox Corporation. **When compared to the original OCR software initially bundled with your scanner.

CIRCLE 163 ON READER SERVICE CARD

END-USER FEATURES

Internet Explorer stresses a Windows look and feel, while Netscape Navigator is remarkably similar across all the platforms it runs on. Both browsers' interfaces stand up well to intense scrutiny.

By Amarendra Singh

Thanks to NCSA Mosaic, the Web browser pioneer, today's browsers have ingeniously simple interfaces and look more alike than different—at least on the surface. Once you look into the details, you'll find many differences that affect their power, configurability, and ease of use.

Netscape Navigator 3.0's interface will look familiar to old Navigator hands, as the basic paradigm has remained unchanged since Version 2.0. You can still set Navigator's main toolbar buttons to display themselves as icons, text, or icons with text, and a second row of buttons gives you fast access to several useful Netscape-sponsored Web sites. You can't customize the URLs associated with these buttons. You can choose to show or hide either of these two rows or the URL location window.

Internet Explorer 3.0 offers a significant number of highly visible enhancements over its previous release. The biggest is in Internet Explorer's three-tiered toolbar, which you can collapse into two rows or a single row by dragging. This lets you substantially increase your screen real estate while keeping easy access to the toolbar items you might want. The Links tier shows a set of useful links; you can customize their URLs. On the whole, the toolbars in Internet Explorer are more flexible than those in Navigator.

Navigator's bookmarks are a step ahead of the Favorites list in Internet Explorer, and its tools for managing bookmarks are much easier to use. Navigator can also check for updates to all or some of your bookmarked pages since you last

visited them. You can import bookmarks into Navigator from any HTML file, and you can insert separators between bookmark entries to help make long lists more readable.

Navigator also gives you detailed information on the last time a bookmark was accessed. Both Internet

Explorer and Navigator let you track your link history by color-coding links to visited sites.

Web browsers are notorious for filling your hard disk with cached pages. Both Internet Explorer and Navigator let you delete your page cache, set the maximum percentage of your hard disk the cache can occupy, and specify how often to check sites to see if cached pages have been updated. Navigator also maintains a memory cache (which you can clear), while Internet Explorer relies on native Windows caching.

Users who have a tough time remembering passwords will be happy with a feature that lets Internet Explorer store user names and passwords for sites that require it. And those who prefer the keyboard over the mouse can use the Tab key to jump from link to link on a page. For its part, Netscape has added backward/forward navigation to the browser pane's right-click menu, letting you jump from page to page without having to move the mouse cursor to the main toolbar.

Users on slow connections will appreciate the fact that Navigator lets you disable autoloading of images yet still lets you download images for any pages you want to see in detail. Internet Explorer lets you disable image loading, but you can't override the setting on a page-by-

page basis. Internet Explorer provides ToolTips (derived from the alternative text tag) that are displayed when your mouse cursor hovers over an image. ToolTips for the Back and Forward buttons specify the pages you will move to.

For those concerned with shielding children or other users from some categories of Web content, Internet Explorer supports the Recreational Software Advisory Council rating scheme for Web sites. This lets site designers rate their own content on a five-degree scale in such categories as profanity, sexual content, and violence. You need to supply a password to access areas that exceed the specified levels. Self-imposed ratings may not provide an ideal solution, but you can configure the browser to block any site that has not been rated. More generally, Internet Explorer supports the PICS (Platform for Internet Content Specification) standard, which allows for the incorporation of future rating schemes.

With its huge installed base, Navigator has established a number of small conventions as to how Web browsers behave, some of which Explorer has mimicked. In



| END-USER FEATURES | | |
|-------------------|---------------------------|-----------|
| N | | E |
| Good | Navigation | Excellent |
| Excellent | Low-bandwidth support | Fair |
| Excellent | Bookmarks | Good |
| Good | Multimedia | Excellent |
| Good | Security | Excellent |
| Excellent | Download and installation | Good |

The navigation rating reflects the power, ease of use, and configurability of menus, command buttons, and right-click context menus. **Low-bandwidth support** covers features designed to optimize browsing over slow connections. **Bookmarks** covers the creation, display, management, and updating of bookmarks. **Multimedia** covers the browser's built-in support for audio, video, and VRML files. **Security** covers the browser's ability to support secure transactions on the Web and to verify the security of downloaded executable code. **Download and installation** covers the packaging of downloadable installation files, the availability of different downloading options, and the smoothness and flexibility of the installation process.

How To Load A Camera.

12x Zoom Lens with Macro

Equivalent of a 38mm to 460mm zoom on a 35mm camera plus an-inch-away macro. One of the most versatile lenses available on any camera.

Auto or Shutter-Priority
The versatility of a professional camera, the ease of point-and-shoot.

450k-pixel

Progressive Scan Chip
Sony's advanced CCD technology and special image processing produce a 768x576, 24-bit high quality image.

Through-the-lens Color LCD Viewfinder
What you see is what you get.

Auto/manual Focus
Full-range automatic for convenience, manual for complete control.

Lithium Ion Battery
For long, dependable use.

In-field review
For instant reassurance that you've got the shot.

SCSI Interface

Fast image transfer direct from the camera.

Built-in Flash
Automatic setting for simplicity, "flash-on" for fill or "flash off" for none.

Removable PC Card Storage
Compatibility with a wide range of computer platforms with standard ATA Type II PCMCIA flash memory card.

JPEG Image Storage
Standard JPEG compression eliminates the need for special software or processing. Compatible with most imaging programs.



Introducing The Portable Digital Still Camera That's Loaded With Features, Not Film.

From the people who started the concept of filmless photography comes the state-of-the-art portable digital camera: the DKC-ID1.



It combines the creative control and professional features found in sophisticated film cameras with the immediacy of digital imaging. Digital photography means rapid turnaround, quick return on your investment and a complete digital record. It's easy and immediate. You capture high quality, color-accurate images, then edit, retouch, present, publish or transmit them right from your computer.

For more information on picture perfect convenience and quality at a price you can afford call 1-800-472-SONY, ext. ID1 or visit our Web site at <http://www.sel.sony.com/SEL/bppg/>.

SONY

©1996 Sony Electronics Inc. Reproduction in whole or in part without written permission is prohibited. All rights reserved. Sony is a trademark of Sony.

CIRCLE 236 ON READER SERVICE CARD

Browsers at the Crossroads

both browsers, for example, Ctrl-D adds the current page to the bookmarks, and Ctrl-B will open the bookmark folder. In some instances, Microsoft has stayed with Windows conventions, one example being the use of F5 for refreshing a screen.

MULTIMEDIA AND VRML

Both Internet Explorer and Navigator provide in-line support for a variety of audio and video formats. Navigator's LiveAudio and LiveVideo deliver .AU, AIFF, MIDI, and .WAV audio and .AVI and QuickTime video. Internet Explorer's ActiveMovie control supports all those formats, plus MPEG. It also supports a pseudo-streaming feature that allows audio and video playback to begin before a full file has been downloaded.

Both browsers give you the ability to view VRML files within the browser window. Microsoft's viewer is licensed from Intervista Corp., and Netscape acquired its Live3D VRML technology last year. Microsoft has announced a licensing agreement with DimensionX to use its Liquid Reality VRML technology in future versions of Internet Explorer.

We found that Internet Explorer delivers good VRML performance but is very sensitive to any errors in the VRML file. Its VRML interface and navigation controls are intuitive. While Navigator's Live3D also offers strong performance, it optimizes the rendering of a VRML file by discarding or ignoring some of the file specification and using its own simplified model. Visually, the results are far from

pleasing. Live3D is more convenient to install, as it is bundled within the complete version of Navigator, and its low sensitivity to file errors lets it execute VRML worlds that more stringent browsers reject.

For secure transactions, such as retrieving your bank balance or paying by credit card, both browsers support the same identification and encryption protocols, SSL 2.0 and 3.0 (both 40-bit and 128-bit). Microsoft also supports its own Private Communications Technology (PCT) 1.0 standard. Both Internet Explorer and Navigator let you use personal certificates, which function as digital IDs for Web transactions. Under these schemes, you apply for a certificate from third-party certificate vendors, such as VeriSign, who supply various levels of certified trust. Personal certificates let you provide information about yourself ranging from your e-mail address to your credit card number and beyond.

Internet Explorer provides an Authenticode feature, which lets suppliers of downloadable executable code (plug-ins or ActiveX controls, for example) attach certificates to their products. These certificates assure the end user that the code is from a known vendor and that it has not been altered. Navigator does not provide a comparable feature.

DOWNLOAD AND SETUP

Navigator is available in two downloadable versions, a complete package (5.9MB) that includes Cooltalk (1.95MB) and Live3D (1.38MB) and a reduced ver-

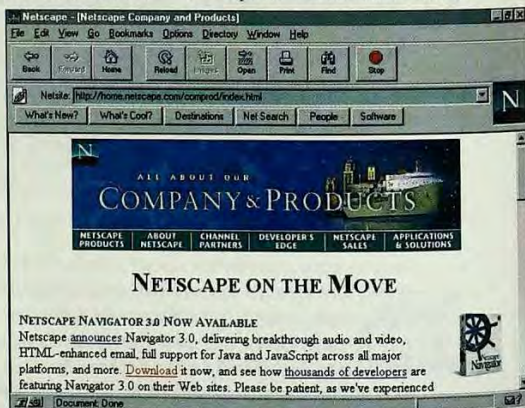
sion (3.6MB) without Cooltalk. Both include the mail and news clients. Internet Explorer is downloadable in three versions. The full installation (8MB) includes mail and news clients (980K), NetMeeting (2.3MB), ActiveMovie (600K), and the HTML layout control (1.43MB). The "typical" version includes mail and news only, and the minimum version includes only the browser. The VRML control is a separate download (1.9MB).

All these downloads are self-extracting and self-installing executable files. Microsoft's installation routine does not allow you to specify a target directory, and if you have a previous version of Internet Explorer, the installer will rename it. The Internet Explorer setup routine will automatically retrieve your Navigator bookmarks and add them to your Favorites list. Both browsers depend on Windows for the Internet connection, although both companies offer versions aimed at users who do not have an Internet access provider.

It should come as no surprise that Microsoft has taken great pains to give Internet Explorer a strong Windows look and feel. Its integration into the Windows environment goes beyond anything in Navigator, which looks, feels, and behaves remarkably the same on every platform. For Windows users, Internet Explorer is a smoother ride. But Netscape's cross-platform focus is at the core of the company's approach to the Web, and that hasn't kept the company from producing a very usable and capable Windows browser, too.



In Internet Explorer, you can hide or expose the command buttons, URL location window, and Links display through drag-and-drop.

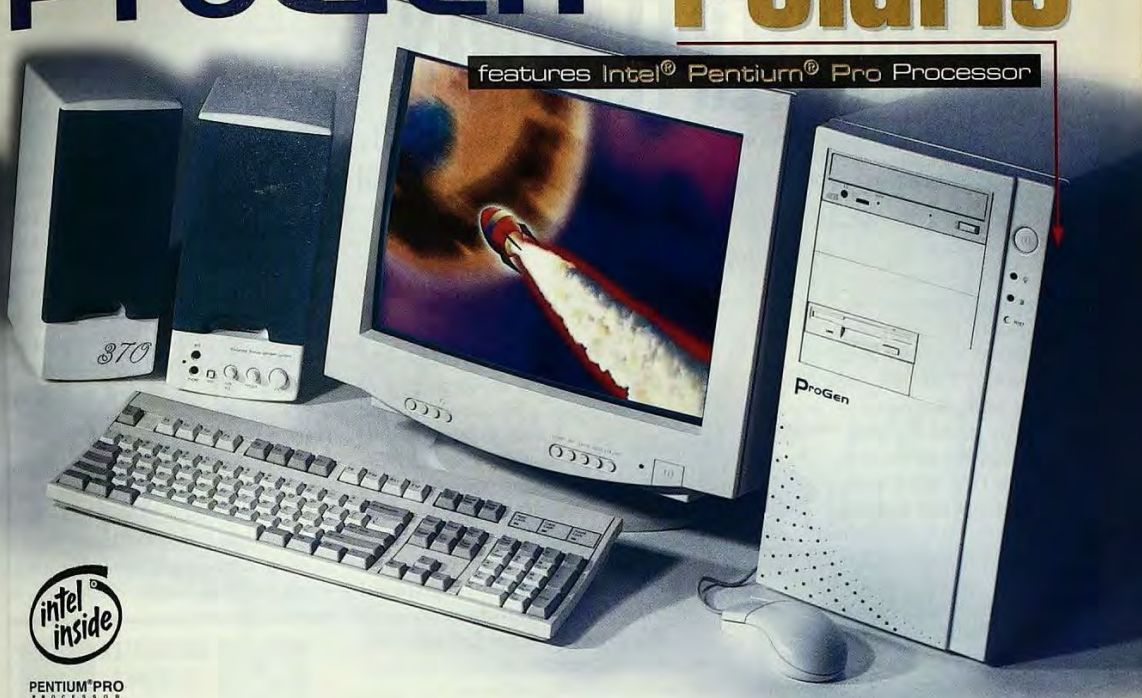


Netscape Navigator's classic interface has not changed much since early versions. Its bookmark feature is still the most flexible and easy to use.

Introducing.....

ProGen® Polaris

features Intel® Pentium® Pro Processor



“12 years of experience”,

in bringing new products to market will make a company define “state of the art”. From multimedia to professional workstation PCs, ProGen® systems offer the best value in the latest technologies. Expect equally solid service and support. The ProGen ProCare package features a 3-year limited warranty with 1-year on-site service*. Feature for feature, dollar for dollar, ProGen Systems offers the best value around. Speak to a ProGen consultant today and discover the difference & come and visit us at <http://www.progen.com> on the World Wide Web.

* On-site service is based on the discretion of ProGen technical support. Leasing Rate will vary pending on State Legislation, and for business or corporate only. 30-day money-back Guarantee (shipping cost not included)

Polaris 180MHZ

- Genuine Intel Performance/VS Systemboard
- 256K Internal L2 Cache
- Faster PCI 2.1 compliant & EDO capable 82440FX PCIset
- 32 MB EDO RAM (up to 128 MB)
- 1.6 GB Fast EIDE Hard Drive
- ProGen GOLD 64V+ 2MB EDO (S3 Trio 64V+), MPEG, Cinepak
- 8X EIDE CD-ROM Drive
- 1.44 MB 3.5" Floppy Disk Drive
- 28.8kbps FAX/modem
- MS-Windows® NT Workstation v4.0
- 15" Digital PnP monitor
- Windows 95 Enhanced Keyboard
- Genuine Microsoft Mouse 2.0
- ProGen ProCare Warranty (3-yr + 1-yr on-site)

\$1999.00

200 MHz \$2099

We accept VISA, M/C, Discover, & American Express

ProGen® Nova

- Genuine Intel Performance/VS Systemboard
- 256K Internal L2 Cache
- Faster PCI 2.1 compliant & EDO capable 82440FX PCIset
- 32 MB EDO RAM (up to 128 MB)
- Creative Labs SoundBlaster 32 PnP
- 1.44 MB 3.5" Floppy Disk Drive
- 33.6kbps FAX/modem
- 104-key Enhanced Keyboard for Win95
- Genuine Microsoft Mouse 2.0
- New MS-Windows® NT Workstation v4.0
- 80W PMPO Amplified Stereo Speakers
- ProGen® ProCare Warranty (3-yr + 1-yr on-site)

180 MHz EIDE \$2569

200 MHz SCSI \$3949

- Panasonic 17" .27dp PnP Monitor
- Large Capacity 2.5 GB Fast EIDE Hard Drive
- Matrox Millennium 3D 1600x1200, 2MB WRAM
- Super 8X EIDE CD-ROM Dr.

- Panasonic 21" .25dp PnP Monitor
- Large Capacity 2.1 GB Ultra SCSI Hard Drive
- Adaptec 2940 PCI Ultra SCSI Adapter
- Matrox Millennium 3D 1600x1200, 4MB WRAM
- New 10X EIDE CD-ROM Dr.

200 MHz SCSI w/ Panasonic 17"

1-800-848-1353

Customer Service: 1-800-848-8767
 Technical Support: 1-888-777-5501

\$3179
ProGen®
 SYSTEMS

A division of ProGen Technology Inc.



Sales Hours:
 M-F, 6:30 A.M. - 7:00 P.M. PST.
 Sat, 9:00 A.M. - 3:00 P.M. PST.
 Tech Support/Customer Service:
 M-F, 8:00 A.M. - 5:00 P.M. PST.

ProGen® Technology, Inc. 15501 Redhill Avenue, Tustin, CA 92780 Ph: 714/566-9200 Fax: 714/566-9267 BBS: 714/566-9255 E-Mail: progen@ix.netcom.com.

©1996 ProGen® Technology, Inc. Intel Inside and Pentium Processor logo are registered trademarks and the Pentium Pro Processor logo is a trademark of Intel Corporation. All other trademarks are the property of their respective owners. Prices are subject to change without notice.

CIRCLE 264 ON READER SERVICE CARD

WEBMASTER FEATURES

Both browsers are fine for conventional sites. But new HTML style-sheet standards are changing the face of page design—and only Internet Explorer currently supports them.

By John Clyman

A familiar advisory at many of the more inventive sites on the Web announces: "This site best viewed with Netscape Navigator." And with Netscape driving the development of HTML extensions, such as tables and frames, faster than the standards committees could keep up—and faster than competitors could adopt them—users of other browsers have been left wondering, "What am I missing out on?"

But the tide has turned. In most areas, Microsoft Internet Explorer 3.0, not Netscape Navigator 3.0, now leads in implementing the most interesting and significant HTML extensions, the capabilities Webmasters will use to build the next generation of cutting-edge sites. While both browsers can produce a respectable rendition of nearly any Web page, Internet Explorer provides superior support for tables, which allow organization of data into rows and columns, and frames, which permit pages to be split into multiple independent regions. More significantly, it supports Cascading Style Sheets (CSS) Level 1, a new HTML draft standard that gives Web designers unprecedented control over the typography and presentation of their pages.

SURF IN STYLE

HTML was created to define the structure of a document, not the details of its presentation. The page author could specify rough distinctions, such as "this is a headline" or "this is a hyperlink," but it was the Web browser that would decide how actually to render this information on a user's screen. Although HTML has



been extended with attributes that allow more control over the appearance of Web pages, even such simple concepts as indentation and line spacing have remained conspicuously absent.

CSS Level 1 addresses those limitations by providing a full set of basic typographical controls. Designers can specify paragraph margins (left, right, top, and bottom), indentation, fonts, line spacing, text highlighting, and more. And while it's possible to select type size in gross increments using plain-vanilla HTML, only CSS (and thus only Internet Explorer) currently allows specification of type size down to the point—or pixel, or pica, or any of a number of other measures. (Navigator 3.0 supports the FACE attribute for the FONT tag, a Microsoft HTML extension that allows control over the typeface that the browser uses.)

Beyond the advantage of greater control over presentation, CSS gives Web authors three important benefits:

- Stylesheets allow style information to be kept in a separate file from the HTML document, making sites far easier to maintain. Multiple pages or even an entire site can point to a single stylesheet, and changes to that one stylesheet will propagate across every page.
- You can apply stylesheets in a way that is generally transparent to noncompliant browsers; with care, there's no need to design completely separate pages.
- With stylesheets, you can use HTML to create display elements, such as headlines, that have traditionally required the use of bulky GIFs.

Netscape has pledged to support style-sheets in Navigator 4.0, scheduled for beta release this fall. What's unclear is whether Navigator will support the same CSS standard as Microsoft. In the meantime, Netscape has adopted several proprietary tags that permit some additional control over presentation. Netscape's MULTICOL tag flows text automatically into multiple columns, with adjustable column width and inter-column spacing. (Traditionally, HTML authors have simulated columns by using tables, an awkward solution.) Additionally, Netscape's SPACER tag permits the insertion of either horizontal or vertical white space of a specified number of pixels.

FRAMES AND TABLES

Frames, which let multiple panes of information occupy a single browser screen, have become a commonplace fixture on the Web. Both Navigator and Internet Explorer support basic and borderless frames, which have no visible divider between

| WEBMASTER FEATURES | | |
|--------------------|-----------------------|-----------|
| Excellent | Basic HTML | Excellent |
| Fair | Typography | Excellent |
| Good | Graphics & multimedia | Excellent |
| Fair | Page layout | Excellent |
| Good | Frames support | Excellent |
| Fair | Tables support | Good |
| Excellent | Forms | Excellent |

Basic HTML covers HTML 2.0 compliance plus some HTML 3.2 features, such as subscripts and superscripts. **Typography** covers the browsers' support for font specification, type size, line spacing, color, highlighting, and so on. **Graphics & multimedia** covers support for various image types, including background images, low-resolution image previews, transparent images, and animations. We also rate support for AVI and MPEG video and for background sounds. **Page layout** covers formatting of text blocks with margins, indentation, columns, and the like. **Frames** covers support for standard, borderless, and floating frames, plus control over attributes such as border size and color. **Tables** covers the browsers' support for tables, table background colors and images, captions and borders, and row and column merging. **Forms** covers support for all HTML form elements.



your organization

STARTING TODAY, ONE PROJECT MANAGEMENT PACKAGE MEETS THE NEEDS OF BOTH.



your team



Introducing Project Scheduler™ 7 for Windows 95 and NT.



Your team needs a sophisticated, yet easy to learn project management tool. Your organization demands flexible and timely access to project data. Now there's a software package that meets the needs of both – Project Scheduler 7.

PS7's on-line guides, extensive Help menus and Wizard Technology ensure that you're off to a quick start. Customizable toolbars, menus and layouts provide uncluttered access to the features you use most. Power players will appreciate Project Scheduler's multi-project management, efficient resource leveling and custom formula support. Plus, our built-in Report Writer will make short work of all your reporting requirements.

Use Project Scheduler's advanced e-mail, OLE-2, SQL and ODBC to exchange data easily with your team. You can even post project status reports directly on your intranet using the HTML publishing feature.

With the time you save on routine tasks, you'll be able to uncover opportunities and implement strategies that put you and your entire organization ahead.

Call 1-800-533-9876

Visit our Web site at: www.scitor.com



©1996 Scitor Corp. 333 Middlefield Road, Menlo Park, CA 94025. Tel: 415-462-4200. Fax: 415-462-4301. Internet: sales@scitor.com.
In Argentina: 541-322-0341. In Australia: (044) 417-267. In Brazil: 55-11-816-3439. In France: (1) 44-32-05-00.
In Germany: (01 80) 535-6880. In Israel: (03) 642-6599. In Malaysia: 60-3-495-4048. In Singapore: 65-284-8528.
In So. Africa: (011) 706-7015. In Sweden: 46 40 122774. In the UK: 1384-392121. Project Scheduler 7 is a registered trademark,
and the Scitor name is a trademark of Scitor Corporation. Windows is a trademark of Microsoft Corporation.

panes and thus allow a more seamless presentation. Both browsers also support a variety of controls over frame attributes, such as whether a frame has scroll bars or is resizable. And both allow nested frames.

Despite this commonality, there are subtle differences. Navigator recognizes attributes that define a border's thickness and color. Microsoft supports the novel and far more sophisticated concept of floating frames, which differ from traditional frames in their ability to appear anywhere on a Web page. Floating frames are a powerful concept that we expect to see more.

Both Navigator and Internet Explorer support tables, and both support grouping of multiple rows and columns, table borders, nested tables, and cell background colors. Yet here, too, Microsoft has taken an incremental lead. Although the World Wide Web Consortium (W3C), which holds formal responsibility for HTML specifications, has not yet ratified a standard for tables, Internet Explorer is closer to supporting RFC (Request For Comments) 1942, the proposal likely to be adopted. Internet Explorer can place background images in table cells and draw different types of borders between cells. As this latter capability is improved, it will become particularly valuable for presentation of complex tabular data, such as balance sheets.

LIGHTS, SOUND, ACTION

In the areas of graphics and multimedia, Navigator and Internet Explorer support slightly divergent capabilities. Nei-

ther is markedly superior, but each has unique strengths and weaknesses. The browsers share the ability to handle basic graphics types, including JPEGs, GIFs, transparent GIFs, and GIF89a animations. Both can handle client-side image maps. Internet Explorer also supports .BMP files, a format seldom found on the Web.

The real differences between them are more esoteric. Navigator, for example, supports the LOWSRC attribute to the IMG tag, which lets designers specify a lower-resolution preview version of a graphic that loads before the full image. That can be particularly useful over slow connections. Internet Explorer, on the other hand, supports a simple DYN SRC attribute that provides nearly the opposite function: It loads an Audio-Video Interleaved (AVI) animation, rather than simply displaying a static graphic. Internet Explorer also provides native support for MPEG-1 video playback, while Navigator does not.

Both Navigator and Internet Explorer support background graphics, but only the latter supports watermarks, or non-scrolling backgrounds—a very minor plus. Both browsers support background sounds as well, each using its own syntax.

BASIC HTML AND FORMS

Both Navigator and Internet Explorer feature strong compliance with HTML 2.0 standards, and perhaps not surprisingly, each browser also supports a handful of minor proprietary extensions. Internet Ex-

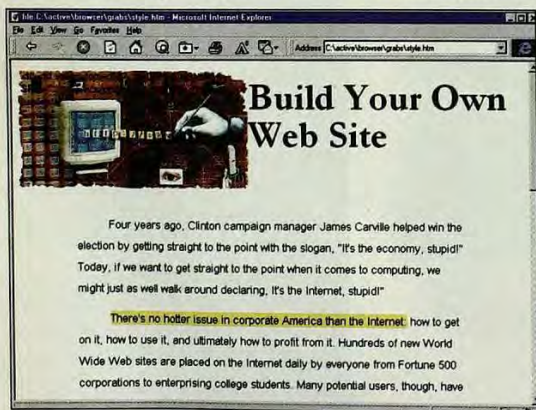
plorer can produce horizontal rules in different colors. It also provides a built-in marquee control that can generate ticker tape-style scrolling text, as many Java applets do.

Netscape supports the BLINK tag, which simply causes text to flash—annoyingly, some feel—and the ALINK attribute to the BODY tag, which changes the color of links as they are clicked.

Navigator offers a few relatively insignificant options that Internet Explorer lacks for presenting lists: It permits specification of the type of bullets to be used in bulleted lists, for instance, and it supports a DL COMPACT tag that produces very compact directory listings.

Both browsers support META tags to enable capabilities such as client pull, which causes a page to refresh automatically after a given time has elapsed. Internet Explorer recognizes one key META tag that is currently ignored by Navigator: the tag that shows a Web page's rating from a PICS (Platform for Internet Content Specification) system such as RSACi, the Recreational Software Advisory Council's standard for rating violence, language, and sexual content.

Feature for feature, Internet Explorer 3.0 has managed to match or exceed Navigator's HTML support in almost every significant area. While Netscape promises support for key enhancements, such as stylesheets, in future releases, Microsoft has succeeded in producing a more capable product for use today.



Internet Explorer's support for cascading stylesheets gives Webmasters true typographic control for the first time.



Netscape Navigator supports tags that will automatically flow text into multiple columns.

Introducing the new Infinia with InTouch.

Tune in to Infinia™, the new high-performance home PC from Toshiba that lets you move from function to function with the touch



while you listen to the radio. Update your sales database as you watch the big game on TV, or talk to your dad in another city on the speaker-



Jump from CD to TV to radio to answering machine, each with the touch of a button.

of a button. It's designed to be right at home in your home—from its

phone. In fact, Infinia offers so many advanced features, you won't believe your eyes. Simply turn

easy-to-use features to its sleek midnight-gray design. Then, there's the InTouch™ Module. A



8X CD-ROM, 3D video and beautiful stereo sound enhance multimedia performance.

the page and see for yourself.

remarkable new device which makes computing easier than ever before. With just a button, for

Plus, it's from Toshiba, the number one name in portable computers. To learn more about the



Infinia offers a fast 200MHz Pentium processor, and huge 3.0GB hard drive.

example, you can go from CD, to TV, to radio, to telephone or answering machine. It's that simple. Trade stocks online

Infinia, visit the Toshiba website at

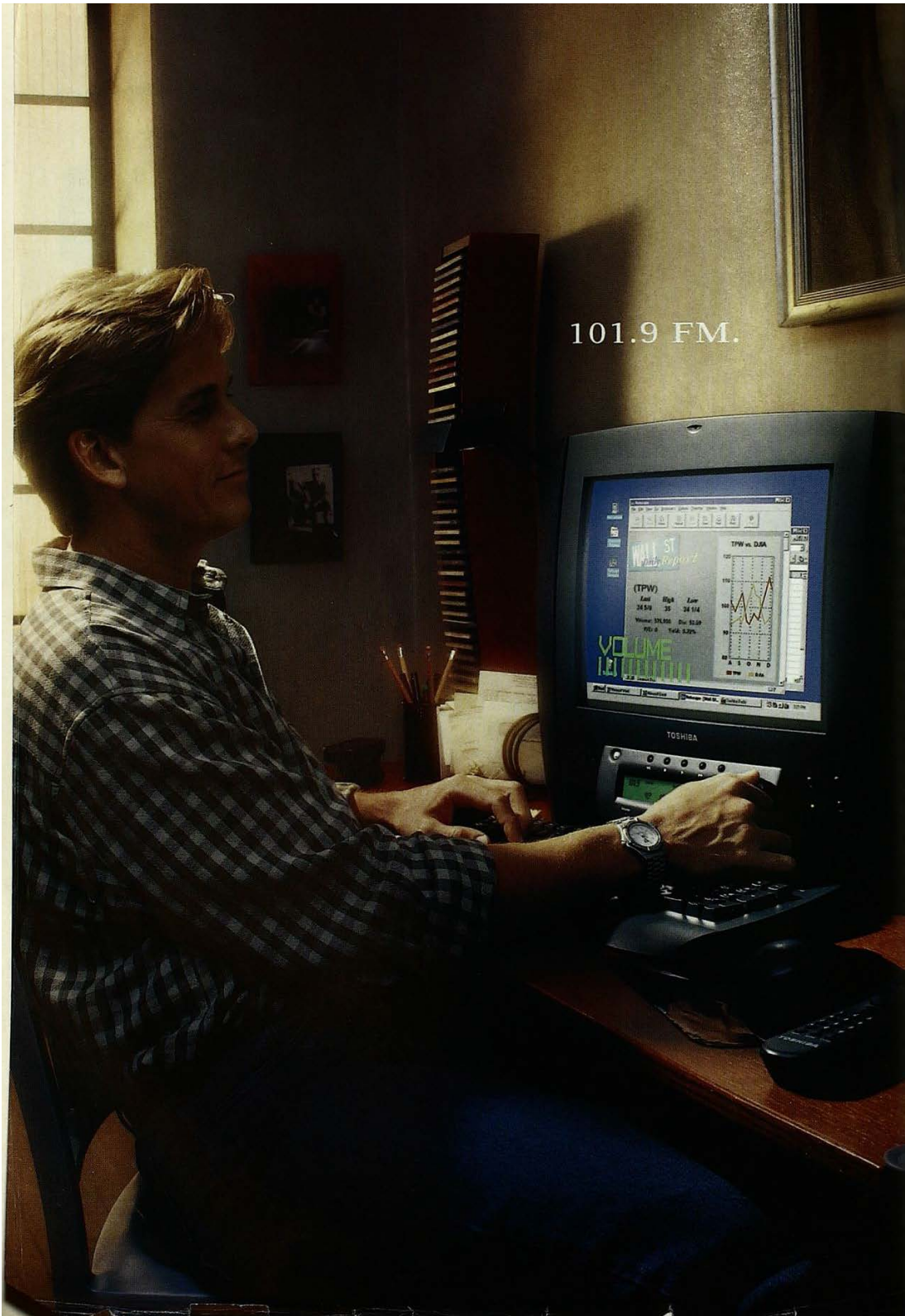
Infinia is supported by Toshiba's InTouch Center every day, 24 hours-a-day.



<http://computers.toshiba.com> or simply call us toll free anytime, any day at 1-800-457-7777.

When you're ready for a different computer.

In Touch with Tomorrow
TOSHIBA



101.9 FM.

DEVELOPER PLATFORMS

Although Microsoft's and Netscape's solutions for developing Web-based applications have many features in common, the companies are moving in fundamentally different directions.

By Thomas Mace

Web browsers have quickly evolved from simple HTML engines into full-fledged application platforms. The underpinnings of these platforms—browser extension APIs, scripting languages, browser objects, and Java—let developers add rich custom functionality to what are otherwise lightweight, generic environments. In every area, from Web-based multimedia to intranet client/server applications development, the effect of the browser platform has been profound.

More than any other vendor, Netscape has pioneered the concept of the browser as an application host. The Netscape Navigator 3.0 platform consists of five basic elements: Navigator plug-ins, Java, JavaScript, Navigator browser objects, and LiveConnect, a set of browser services that can tie the other elements together.

Given Netscape's overwhelming market dominance, Microsoft had little choice but to clone the Navigator platform. Microsoft Internet Explorer 3.0 does this with reasonable success and in some areas significantly improves on Netscape's implementation. Internet Explorer also introduces ActiveX, an important new standard based on Microsoft's Component Object Model (COM) that offers significant benefits to developers in 32-bit Windows environments.

PLUG-INS AND JAVA

The best-known Navigator extension standard is the Plug-in API, and some of the Web's most interesting rich-media types are delivered via plug-ins. The tools for building plug-ins, provided in the



Netscape LiveConnect/Plug-in SDK 3.0, are aimed at C developers and provide for relatively straightforward ports of existing code. Plug-ins are platform-specific; developers need to create separate versions for each operating environment they wish to support. They are also inherently insecure, as they have full access to system services, including memory and file I/O.

Internet Explorer 3.0 supports most major plug-ins, including such staples as Envoy, ichtat, RealAudio, and Shockwave. Some less common plug-ins, however, do not work reliably. Microsoft blames its spotty support on Netscape's failure to publish a plug-in container specification (the Plug-In API itself is public).

While plug-ins have proved highly successful with developers, Netscape is moving toward Sun Microsystems' Java programming language as its core browser-enhancement technology. Navigator 2.0 was the first major commercial browser to provide a Java virtual machine (VM), and Navigator 3.0 introduces a powerful Java enhancement, a just-in-time (JIT) compiler that compiles Java programs into faster native machine code on the fly.

Unlike plug-ins, Java applets are platform-independent. Java also offers a tight "sandbox" security model, letting the browser trap and disallow all memory- and file-access calls. Java has enormous potential for corporate developers who must deploy applications across multiple hardware and operating-system platforms. Navigator 3.0, available for 32-bit and 16-bit Windows, Macintosh, and 11

Unix operating systems, is supremely well positioned as a cross-platform Java host.

Sadly, our tests of the Navigator Java VM (in the 32-bit Windows implementation) showed it to be buggy and on the slow side. In contrast, Internet Explorer's implementation of the Java VM and JIT is stable and fast. Interestingly, we found that neither browser is capable of supporting highly complex Java applications that employ with large data structures. (For a detailed look at all our Java test results, see "Java Speed Trials" in this issue.)

SCRIPTING AND BROWSER OBJECTS

Netscape Navigator 3.0 provides a simple programming language and runtime environment called JavaScript, which despite its name bears almost no resemblance to Java. JavaScript code is transmitted to the browser in text form as part of the HTML page. You can use it to generate new

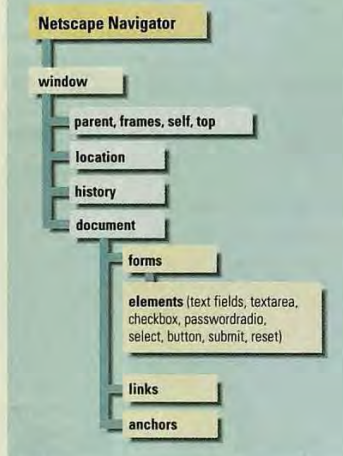
| DEVELOPER PLATFORMS | | |
|---------------------|-------------------------------|-----------|
| N | | E |
| Excellent | Web applications | Excellent |
| Good | Intranet applications | Excellent |
| Excellent | Client-side scripting | Excellent |
| Good | Programmable objects | Excellent |
| Good | Browser extensibility | Excellent |
| Excellent | Plug-in support | Fair |
| Fair | Java support | Good |
| N/A | ActiveX support | Excellent |
| Excellent | Cross-platform support | Poor |
| Excellent | Security | Excellent |

N/A—Not applicable: The product does not have this feature.

For Web applications, we rate each browser as a platform and as a delivery vehicle for publicly accessible sites. **Under intranet applications**, we provide a comparable rating for complex corporate applications. **Client-side scripting** covers the power and quality of the browser's scripting language(s). **Programmable objects** covers the richness of programmatically exposed browser functionality. **Browser extensibility** reflects each browser's overall extension architecture. **Plug-in support** reflects the browser's ability to host plug-ins. **Java support** describes each one as a Java runtime environment. **ActiveX support** describes the browser as an ActiveX container and server. **Cross-platform support** reflects the browser's availability on multiple hardware and OS platforms. **Security** describes the model for protection against malign browser extensions.

Netscape Navigator Browser Objects

The logical hierarchy of programmable browser objects exposed by Netscape Navigator 3.0.



HTML page elements on the fly, respond to user actions such as button clicks and check-box selections, or perform simple client-side processing and data validation. JavaScript does not have file- or memory-access capabilities, so it is highly secure.

Internet Explorer provides two scripting languages. The first, JScript, is a very close clone of Netscape's JavaScript. The second, Visual Basic Scripting Edition (VBScript), is Internet Explorer's native scripting language. VBScript, derived from Basic, has a decidedly different flavor from JavaScript but offers comparable features, ease of use, and security.

One of the most powerful features of browser scripting languages is their use of *browser objects*, units of ready-made functionality that the browser exposes to the programmer. Navigator provides a comprehensive set of browser objects, many of which encapsulate the elements of HTML pages and forms. Text fields, buttons, radio buttons, and check boxes are among the most useful. Others, such as the history list, encapsulate elements of Navigator itself. With a few annoying exceptions, Internet Explorer implements the Navigator browser objects and methods, and you work with them using either JScript or VBScript.

Internet Explorer also exposes a different and very important set of objects

called ActiveX controls. These are a simplified superset of the familiar OLE controls used by Visual Basic and many third-party development tools. Although ActiveX is not a formal standard, both the control and container specifications are publicly available. Internet Explorer exposes the usual buttons and list boxes as well as image, hot-spot, marquee, multimedia, and other controls, which can be put on your HTML page and manipulated using JScript or VBScript. Internet Explorer itself is programmable through its ActiveX interfaces, so developers can build fully customized browser containers.

More importantly, the ActiveX environment lets you add third-party ActiveX controls to your pages. More than 1,000 controls are now on the market. You'll find everything from fully functional spreadsheets to 3-D world viewers, and these controls largely surpass anything currently available for Java. Generally, these controls are far easier to integrate into applications than plug-ins or Java applets. ActiveX controls not originally built for Web use may be quite large, however.

LIVECONNECT AND ACTIVE CONTENT

The biggest change that Navigator 3.0 brings to the Netscape browser platform is LiveConnect, a set of browser services for combining JavaScript, Java, plug-ins, and HTML objects into compound applications via a common object model, the Java Runtime Interface. LiveConnect programming is not trivial. Programmers must know the calling conventions of each object used, which probably means having access to the source code. But LiveConnect is significant in allowing integration of robust elements written in C with the Java/JavaScript environment.

Internet Explorer provides a comparable environment, based on ActiveX, that unifies ActiveX controls, Java, plug-ins, HTML objects, and the two scripting

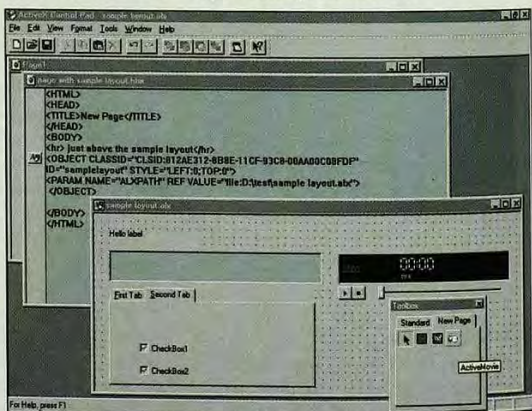
languages. Under Internet Explorer, all Java applets are automatically wrapped in an ActiveX automation interface, making them full members of the ActiveX environment. In many ways, Microsoft's solution is more tightly integrated and easier to work with than Netscape's. Its drawback is that, like all ActiveX technology, it is limited to 32-bit Windows.

INTERNETS AND INTRANETS

For developing public Web sites designed to reach the largest possible audience, your only real option today is the Netscape platform, with its plug-ins, Java, and JavaScript. Navigator's plug-in support is clearly more reliable than Internet Explorer's, while Internet Explorer offers a superior Java environment.

For corporate intranet applications, the choice is more complex. Neither browser has what it takes to support heavy-duty Java applications with large data structures. ActiveX and its related technologies are the most attractive option for 32-bit Windows shops, but companies with 16-bit Windows legacy systems, Unix desktops, and Macintoshes will have to look elsewhere for now.

The only remaining option is to use Navigator plug-ins, possibly with the addition of lightweight Java applets and script. This somewhat retro solution is platform-dependent and lacks a clear upgrade path to Java or ActiveX. Today your choice of platform will involve compromises. We hope to see the next browser generation expand the options further.



Powerful ActiveX controls and slick tools for working with them make Internet Explorer extremely attractive for developers.

**LOOKING
FOR THE
BEST PCs
ON THE
MARKET?**



MICRON™
ELECTRONICS, INC.

WHAT A
COINCIDENCE,
WE HAPPEN TO
MAKE THEM.



SUPERIOR SOLUTIONS BY DESIGN



Any PC maker can claim to offer a solution that covers your needs. But at Micron Electronics, we prefer to let our history and our products speak for themselves. We think you'll agree it's an impressive story.

Superior Technology—A Micron Tradition

Micron Electronics builds PCs with a legacy of excellence. Our manufacturing processes grew out of nearly two decades in the semiconductor business, where precision is measured in millionths of an inch, and quality in parts per million. We've built strategic relationships with companies like Intel, Microsoft and Novell. From this solid background, we're forging unbeatable systems you can count on today and tomorrow. Best of all, we just doubled our memory and added powerful enhancements to several of our systems (see configurations). This industry-leading approach gives you a vast increase in system capacity.

Award-Winning Products

In the past two years, leading industry publications have applauded Micron Electronics PCs with more than 140 awards for product performance, customer service and support. This includes *PC Magazine* Best

Products of 1995 and Editors' Choice awards in several categories. Add more than 40 *PC World* Best Buy awards and you've got an impressive technology hall of fame. In fact, just this summer, we have won three *PC Magazine* Editors' Choice® Awards for Millennium™ desktop and Millennium TransPort™ notebook computers—an unprecedented achievement for Micron Electronics.

Recognized Service and Reliability

After your purchase, the story continues. Just ask *PC Magazine* readers. They bestowed on us the coveted Readers' Choice for Customer Service and Reliability in 1994 and 1995. And *PC World* recently awarded us first-tier status along with the likes of Apple, Compaq, Digital and HP. Pretty good company, wouldn't you say?

Micron Power™ Warranty—An Industry First

We support our reliability promise with the industry-leading Micron Power warranty. It backs the microprocessor and main memory for five years, an industry first. Add a three-year, parts-only system warranty and a 30-day money-back guarantee, and you can rest assured that you're in good hands.

RELIABILITY RANKING



Source: *PC World* Reliability & Service Monitor, May 20 - November 20, 1995



Outstanding Performance—Don't Take Our Talk is cheap when you're speaking for yourself; it carries weight. Here are a few of many examples.

- Home MPC "... the fastest we've ever tested award. ..." —*Family PC*, May 1996
- Millennium "In short, Micron covers all the bases."
- PowerServer "This is definitely a best buy." —*PC Magazine*, April 1996
- Millennium TransPort "... nearly a dead ring."

The Right System for You

Micron Electronics makes a suite of outstanding servers, desktop PCs to portable multimedia. For details and prices, turn the page.



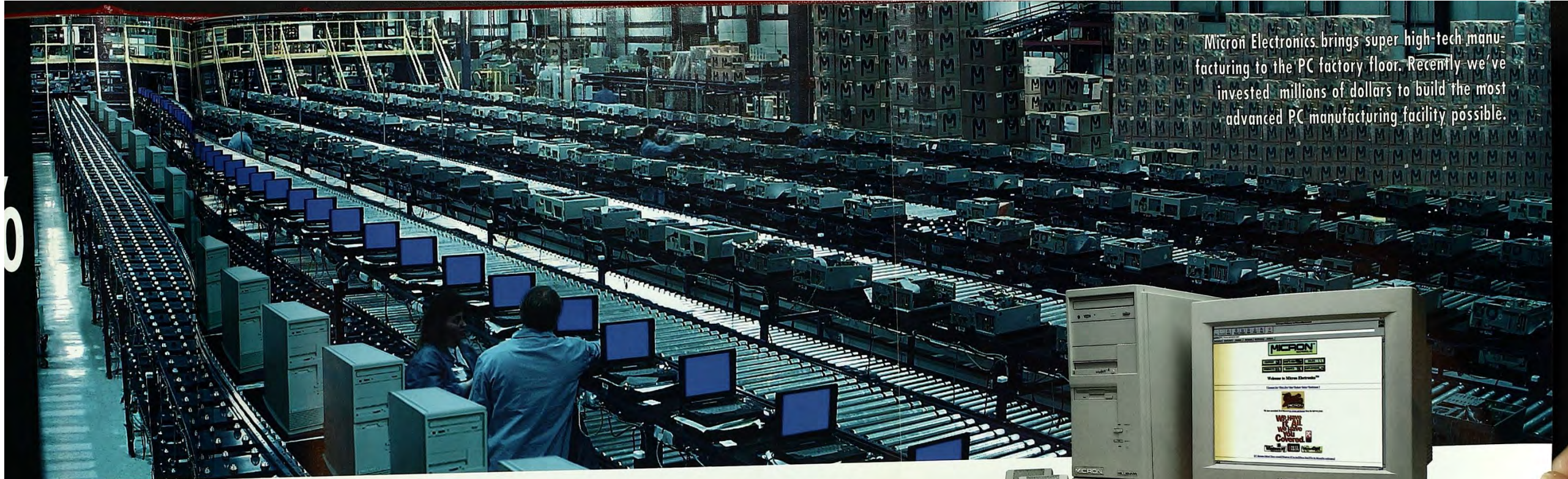
NOW YOU GET TWICE THE MEMORY IN SELECTED SYSTEMS! (SEE CONFIGURATIONS)

Micron Power™ Warranty & Support

- 5-year limited warranty on microprocessor and main memory
- 3-year limited parts-only system warranty
- 1-2- or 3-year optional on-site service agreement for Micron desktop systems
- 30 days of free Micron-supplied software support for Micron desktop systems
- 30-day money-back policy
- 24-hour technical support

The foregoing is subject to and qualified by Micron's standard limited warranties and terms and conditions of sale and is not a contract. Copies of the limited warranties may be viewed on our Web site or by calling Micron.

Micron Electronics brings super high-tech manufacturing to the PC factory floor. Recently we've invested millions of dollars to build the most advanced PC manufacturing facility possible.



SUPERIOR SOLUTIONS BY DESIGN



Any PC maker can claim to offer a solution that covers your needs. But at Micron Electronics, we prefer to let our history and our products speak for themselves. We think you'll agree it's an impressive story.

Superior Technology—A Micron Tradition

Micron Electronics builds PCs with a legacy of excellence. Our manufacturing processes grew out of nearly two decades in the semiconductor business, where precision is measured in millionths of an inch, and quality in parts per million. We've built strategic relationships with companies like Intel, Microsoft and Novell. From this solid background, we're forging unbeatable systems you can count on today and tomorrow. Best of all, we just doubled our memory and added powerful enhancements to several of our systems (see configurations). This industry-leading approach gives you a vast increase in system capacity.

Award-Winning Products

In the past two years, leading industry publications have applauded Micron Electronics PCs with more than 140 awards for product performance, customer service and support. This includes *PC Magazine* Best Buy

Products of 1995 and Editors' Choice awards in several categories. Add more than 40 *PC World* Best Buy awards and you've got an impressive technology hall of fame. In fact, just this summer, we have won three *PC Magazine* Editors' Choice® Awards for Millennia™ desktop and Millennia TransPort™ notebook computers—an unprecedented achievement for Micron Electronics.

Recognized Service and Reliability

After your purchase, the story continues. Just ask *PC Magazine* readers. They bestowed on us the coveted Readers' Choice for Customer Service and Reliability in 1994 and 1995. And *PC World* recently awarded us first-tier status along with the likes of Apple, Compaq, Digital and HP. Pretty good company, wouldn't you say?

Micron Power™ Warranty—An Industry First

We support our reliability promise with the industry-leading Micron Power warranty. It backs the microprocessor and main memory for five years, an industry first. Add a three-year, parts-only system warranty and a 30-day money-back guarantee, and you can rest assured that you're in good hands.



Source: *PC World* Reliability & Service Monitor, May 20 - November 20, 1995

Outstanding Performance—Don't Take Our Word for It.

Talk is cheap when you're speaking for yourself. But when it's from the mouth of an industry expert, it carries weight. Here are a few of many examples of what they're saying about our PCs:

- Home MPC "... the fastest we've ever tested... as well as a marvelous family package... it wins our Top Rated award..." —*Family PC*, May 1996
- Millennia "In short, Micron covers all the bases with this Best Buy." —*PC World*, March 1996
- PowerServer "This is definitely a best buy." —*Computer Shopper*, January 1996
- Millennia TransPort "... nearly a dead ringer for IBM's ThinkPad... but performs better and saves you about \$2,500." —*PC Magazine*, April 1996

The Right System for You

Micron Electronics makes a suite of outstanding solutions designed for the way you work or play. From home systems to servers, desktop PCs to portable multimedia solutions, Micron Electronics always comes through with a system built to satisfy. For details and prices, turn the page.

Micron Power™ **Warranty & Support**

- 5-year limited warranty on microprocessor and main memory
- 3-year limited parts-only system warranty
- 1-, 2- or 3-year optional on-site service agreement for Micron desktop systems
- 30 days of free Micron-supplied software support for Micron desktop systems
- 30-day money-back policy
- 24-hour technical support

The foregoing is subject to and qualified by Micron's standard limited warranties and terms and conditions of sale. Terms and conditions of sale may vary for specific configurations. Copies of the limited warranties may be obtained on our Web site or by calling Micron.



MICRON
ELECTRONICS, INC.

800-707-2329

<http://www.mei.micron.com>



With our legacy of memory and manufacturing expertise, Micron Electronics has just doubled memory in several systems. (see configurations). We've added other powerful enhancements to give you a vast increase in system capacity.

MILLENNIA™ P166

- Intel 166MHz Pentium® processor
- 512KB pipeline burst cache, flash BIOS
- 8X EIDE CD-ROM drive, 3.5" floppy drive
- 16-bit stereo sound & speakers
- PCI 64-bit 3D video, MPEG, 4MB EDO
- Tool-free minitower or desktop
- Microsoft® Mouse, 104-key keyboard
- Microsoft Windows® 95 & MS® Plus! CD
- 5-year/3-year Micron Power™ warranty

• 1.2GB EDO RAM • 2.1GB EIDE hard drive
 • 15" Micron 15FGx, 28dp (13.7" display)
 • Microsoft Works 95 CD
\$1,999 Business lease \$48/month

- 32MB EDO RAM • 2.1GB EIDE hard drive
- 15" Micron 15FGx, 28dp (13.7" display)
- Microsoft Office Pro 95 & Bookshelf® 95 CDs

\$2,399 Business lease \$82/month

- 64MB EDO RAM • 3.1GB EIDE hard drive
- 17" Micron 17FGx, 26dp (15.8" display)
- Microsoft Office Pro 95 & Bookshelf 95 CDs

\$3,149 Business lease \$107/month

- With 133MHz Pentium processor.....subtract \$200
- With 200MHz Pentium processor.....add \$100

MILLENNIA™ P200 PLUS

- Intel 200MHz Pentium processor
- 512KB pipeline burst cache, flash BIOS
- PCI 32-bit Ultra SCSI Fast-20 controller
- 8X SCSI CD-ROM drive, 3.5" floppy drive
- 16-bit stereo sound & speakers
- PCI 64-bit 3D video, MPEG, 4MB EDO
- Tool-free minitower or desktop
- Microsoft Mouse, 104-key keyboard
- Microsoft Windows 95 & MS Plus! CD
- 5-year/3-year Micron Power warranty

• 1.6GB EDO RAM • 2GB Fast SCSI-2 hard drive
 • 15" Micron 15FGx, 28dp (13.7" display)
 • Microsoft Works 95 CD
\$2,899 Business lease \$99/month

- 32MB EDO RAM • 2GB Fast SCSI-2 hard drive
- 15" Micron 15FGx, 28dp (13.7" display)
- Microsoft Office Pro 95 & Bookshelf 95 CDs

\$3,199 Business lease \$109/month

- 64MB EDO RAM • 4GB Fast SCSI-2 hard drive
- 17" Micron 17FGx, 26dp (15.8" display)
- Microsoft Office Pro 95 & Bookshelf 95 CDs

\$4,249 Business lease \$145/month

- With 166MHz Pentium processor.....subtract \$100

HOME MPC™ P133

- Intel 133MHz Pentium® processor
- 256KB pipeline burst cache, flash BIOS
- 16MB EDO RAM • 1.2GB EIDE hard drive
- 8X EIDE CD-ROM drive, 3.5" floppy drive
- 16-bit stereo sound & speakers
- Advent AV270 2x25 watt stereo speakers
- 28.8 fax/modem, speakerphone, voice mail
- Microsoft® Phone telephony software
- Microsoft® Internet Explorer
- Prodigy®, America Online® & CompuServe trial memberships
- PCI 64-bit 3D video, MPEG, 2MB EDO
- 15" Micron 15FGx, 28dp (13.7" display)
- Tool-free minitower or desktop
- Microsoft Mouse, 104-key keyboard
- Microsoft Windows® 95 & MS® Plus! CD
- Quicken® Financial Pak includes: Quicken Deluxe 5.0; Quicken Financial Planner™; Quicken Parents' Guide to Money™; Quicken Family Lawyer™
- Family Pak includes: ABC by Dr. Seuss; Thinkin' Things™ Collection 1; Earthworm Jim™; and MechWarrior™ 2
- Microsoft Home Pak includes: Works 4.0 for Windows 95; Publisher Deluxe for Windows 95; Encarta® 96; Encarta 96 World Atlas; Music Central™ 96; Wine Guide; Arcade 1.0; Scenes-Sports Extremes Collection; Cinemania™ 96; Julia Child Home Cooking; Best of Windows Entertainment Pack; CD Sampler (including Fury® game demo)
- 5-year/3-year Micron Power™ warranty

\$1,999 Business lease \$57/month

- 32MB EDO RAM • 1.2GB EIDE hard drive
- 15" Micron 15FGx, 28dp (13.7" display)
- Microsoft Works 95 CD

\$2,249 Business lease \$77/month

- 32MB EDO RAM • 2.1GB EIDE hard drive
- 17" Micron 17FGx, 26dp (15.8" display)
- Microsoft Office Pro 95 & Bookshelf® 95 CDs

\$2,899 Business lease \$99/month

- With 166MHz Pentium processor.....subtract \$100
- With 17" Micron 17FGx, 26dp (15.8" display).....add \$250

HOME MPC™ P200

- Intel 200MHz Pentium processor
- 256KB pipeline burst cache, flash BIOS
- 32MB EDO RAM • 2.1GB EIDE hard drive
- 8X EIDE CD-ROM drive, 3.5" floppy drive
- 16-bit stereo sound & speakers
- Advent AV270 2x25 watt stereo speakers
- 28.8 fax/modem, speakerphone, voice mail
- Microsoft® Phone telephony software
- Microsoft® Internet Explorer
- Prodigy®, America Online® & CompuServe trial memberships
- PCI 64-bit 3D video, MPEG, 2MB EDO
- 15" Micron 15FGx, 28dp (13.7" display)
- Tool-free minitower or desktop
- Microsoft Mouse, 104-key keyboard
- Microsoft Windows® 95 & MS® Plus! CD
- Microsoft Office Pro 95 & Bookshelf® 95 CDs
- Quicken® Financial Pak includes: Quicken Deluxe 5.0; Quicken Financial Planner™; Quicken Parents' Guide to Money™; Quicken Family Lawyer™
- Family Pak includes: ABC by Dr. Seuss; Thinkin' Things™ Collection 1; Earthworm Jim™; and MechWarrior™ 2
- Microsoft Home Pak includes: Works 4.0 for Windows 95; Publisher Deluxe for Windows 95; Encarta® 96; Encarta 96 World Atlas; Music Central™ 96; Wine Guide; Arcade 1.0; Scenes-Sports Extremes Collection; Cinemania™ 96; Julia Child Home Cooking; Best of Windows Entertainment Pack; CD Sampler (including Fury® game demo)
- 5-year/3-year Micron Power™ warranty

\$2,899 Business lease \$99/month

- 32MB EDO RAM • 2.1GB EIDE hard drive
- 17" Micron 17FGx, 26dp (15.8" display)
- Microsoft Office Pro 95 & Bookshelf® 95 CDs

\$3,349 Business lease \$114/month

- 64MB EDO RAM • 4GB Fast SCSI-2 hard drive
- 17" Micron 17FGx, 26dp (15.8" display)
- Microsoft Office Pro 95 & Bookshelf® 95 CDs

\$4,399 Business lease \$150/month

- With 133MHz Pentium processor.....subtract \$200
- With 200MHz Pentium processor.....add \$100

MILLENNIA TRANSPORT™

- Intel 430MX PCI chipset
- 256KB L2 pipeline burst cache
- 16MB EDO memory (48MB max.)
- 8X modular CD-ROM drive
- PCI graphics accelerator, 1MB EDO memory
- Pick-a-Point™ dual pointing devices integrate both pointing stick and touchpad
- Removable EIDE hard drive
- 3.5" modular floppy drive
- Intelligent modular lithium-ion battery
- 16-bit stereo sound
- Built-in stereo speakers and microphone
- 2 Type II or one Type III PCMCIA slots
- S-video and NTSC-video outputs
- Headphone, microphone and line-in jacks
- 2 infrared ports, one front, one back
- Parallel, serial, VGA and 2 PS/2 ports
- Dimensions: 11.7" x 9.4" x 2.0", Weight: 6.9 lbs.†
- Nylon carrying case
- Microsoft® Windows® 95 and MS® Plus! CD
- Microsoft Office Pro 95 and Bookshelf® 95 CDs
- Kensington® security lock ready††
- 5-year/3-year Micron Power™ limited warranty

\$4,399 Business lease \$150/month

\$5,199 Business lease \$163/month

\$5,550 Business lease \$174/month

† 6.9 lbs includes 3.5" floppy and one battery
 †† Lock secures both Millennia Transport and MicroDock

MILLENNIA™ Pro200

- Intel 200MHz Pentium® Pro processor
- 256KB internal cache, flash BIOS
- 8X EIDE CD-ROM drive, 3.5" floppy drive
- 16-bit stereo sound & speakers
- PCI 64-bit 3D video, MPEG, 4MB EDO
- Tool-free minitower or desktop
- Microsoft® Mouse, 104-key keyboard
- Microsoft Windows NT® Workstation CD
- 5-year/3-year Micron Power™ warranty

• 1.6GB EDO RAM • 1.2GB EIDE hard drive
 • 15" Micron 15FGx, 28dp (13.7" display)
 • Microsoft Works 95 CD
\$2,249 Business lease \$77/month

- 32MB EDO RAM • 2.1GB EIDE hard drive
- 17" Micron 17FGx, 26dp (15.8" display)
- Microsoft Office Pro 95 & Bookshelf® 95 CDs

\$2,899 Business lease \$99/month

- 32MB EDO RAM • 2.1GB EIDE hard drive
- 17" Micron 17FGx, 26dp (15.8" display)
- Microsoft Office Pro 95 & Bookshelf® 95 CDs

\$2,899 Business lease \$99/month

Microsoft Windows NT Workstation 3.51 or 4.0 available on selected configurations.

- 133MHz Mobile Pentium processor
- 16MB EDO memory (48MB max.)
- 12.1" active matrix display, 800 x 600
- 1.2GB removable hard drive

\$4,399 Business lease \$150/month

- 133MHz Mobile Pentium processor
- 32MB EDO memory (48MB max.)
- 12.1" active matrix color display, 800 x 600
- 1.2GB removable hard drive
- Motorola® Montana 28.8 fax/modem
- 2nd lithium-ion battery

\$5,199 Business lease \$163/month

- 150MHz Mobile Pentium processor
- 32MB EDO memory (48MB max.)
- 12.1" active matrix color display, 800 x 600
- 2.1GB removable hard drive
- Motorola® Montana 28.8 fax/modem
- 2nd lithium-ion battery
- Samsontec® leather carrying case

\$5,550 Business lease \$174/month

OPTIONS

- With 150MHz Pentium processor.....add \$200
- With 2nd modular lithium-ion battery.....add \$199
- With 2nd 1.2GB hard drive.....add \$599
- With 2nd 2.1GB hard drive.....add \$699
- With 16MB DIMM module upgrade.....add \$349
- With 32MB DIMM module upgrade.....add \$749

International Sales 208-893-8970
 International Fax 208-893-7393
 Tollfree from Puerto Rico 800-708-1756
 Tollfree from Canada 800-708-1758
 Tollfree from Mexico 95-800-708-1755
 • 900 E. Karcher Road, Nampa, ID 83687
 • Mon-Fri 6am-10pm Sat 7am-5pm (MT)
 • International Sales Hours: Mon-Fri 6am-7pm (MT)
 • 208-893-3434 • Fax 208-893-3424
 • Purchase Order Fax 208-893-8992
 • GSA Contract #GSS5F4317D
 • Technical Support Available 24 Hours A Day-7 Days A Week
 • Technical Support E-mail: techsupport.mei@micron.com

POWERSERVER SMP-N P133

- Intel 133MHz Pentium® processor
- Dual Pentium SMP ZIF sockets
- 512KB write-back cache, flash BIOS
- Slots: 5 EISA, 2 PCI, 1 EISA/PCI
- Adapter: PCI 32-bit Ultra SCSI Fast-20 controller
- 8X SCSI-2 CD-ROM drive
- 8X SCSI-2 CD-ROM drive
- 3.5" floppy drive
- 64-bit 1MB ISA video
- 3Com 3C595 PCI 10/100 Ethernet NIC
- Full-size tower with 10 drive bays
- Microsoft® Mouse, 104-key keyboard
- Novell® NetWare® 4.1 (5 user license)
- NOS support (3 free resolutions)
- 5-year/3-year Micron Power™ warranty

• 16MB RAM • 1GB SCSI-2 hard drive
 • 15" Micron 15FGx, 28dp (13.7" display)
\$3,599 Business lease \$122/month

• 32MB RAM • 2GB Ultra SCSI hard drive
 • 15" Micron 15FGx, 28dp (13.7" display)
\$3,799 Business lease \$129/month

Now shipping with Netware 4.0!

POWERSERVER SMP-N P266

- Dual Intel 133MHz Pentium processors
- 512KB write-back cache, flash BIOS
- Slots: 5 EISA, 2 PCI, 1 EISA/PCI
- Adapter: PCI 32-bit Ultra SCSI Fast-20 controller
- 8X SCSI-2 CD-ROM drive
- 8X SCSI-2 CD-ROM drive
- 3.5" floppy drive
- 64-bit 1MB ISA video
- 3Com 3C595 PCI 10/100 Ethernet NIC
- Full-size tower with 10 drive bays
- Microsoft® Mouse, 104-key keyboard
- Novell® NetWare® 4.1 (5 user license)
- NOS support (3 free resolutions)
- 5-year/3-year Micron Power™ warranty

• 32MB RAM • 2GB Ultra SCSI hard drive
 • 15" Micron 15FGx, 28dp (13.7" display)
\$4,799 Business lease \$163/month

• 64MB RAM • 4GB Ultra SCSI hard drive
 • 15" Micron 15FGx, 28dp (13.7" display)
\$4,999 Business lease \$170/month



CLIENTPRO™ P120

- Intel 120MHz Pentium® processor
- 256KB pipeline burst cache, flash BIOS
- 3Com 3C509 Combo network adapter
- 3.5" floppy drive
- Tool-free minitower or desktop
- Microsoft® Mouse, 104-key keyboard
- MS-DOS® 6.22/Windows™ for Workgroups 3.11
- 5-year/3-year Micron Power™ warranty

• PCI 64-bit graphics accelerator (2MB EDO)
 • 8MB EDO RAM • 1.2GB EIDE hard drive
 • 14" Micron 14FGx, 28dp (12.9" display)
 • Microsoft Works preinstalled
\$1,499 Business lease \$51/month

- PCI 64-bit graphics accelerator (2MB EDO)
- 16MB EDO RAM • 1.2GB EIDE hard drive
- 15" Micron 15FGx, 28dp (13.7" display)
- Microsoft Works preinstalled

\$1,819 Business lease \$62/month

- With 133MHz Pentium processor.....add \$50

CLIENTPRO™ P200

- Intel 200MHz Pentium processor
- 256KB pipeline burst cache, flash BIOS
- 3Com 3C509 Combo network adapter
- 3.5" floppy drive
- Tool-free minitower or desktop
- Microsoft® Mouse, 104-key keyboard
- MS-DOS® 6.22/Windows™ for Workgroups 3.11
- 5-year/3-year Micron Power™ warranty

• PCI 64-bit graphics accelerator (2MB EDO)
 • 8MB EDO RAM • 1.2GB EIDE hard drive
 • 14" Micron 14FGx, 28dp (12.9" display)
 • Microsoft Works preinstalled
\$3,207 Business lease \$106/month

- With 166MHz Pentium processor.....subtract \$100

NEW

January 9, 1996
 June 25, 1996
 August 1996

MILLENNIA P166
 MILLENNIA P133
 TRANSPORT P133

May 30, 1995
 May 16, 1995
 1994 and 1995

MILLENNIA P120
 HOME MPC P90

January 1996
 April 1996

MILLENNIA P133
 MILLENNIA Transport

January 1996
 June 1996
 May 1996
 December 1995

POWERSERVER SMP P133
 MILLENNIA P166
 HOME MPC P133
 MILLENNIA P133

Make a Great PC Even Better!

Custom configure your new Micron system with these popular options.

MULTIMEDIA OPTIONS

- 16-bit 3D Waveable stereo sound.....\$59*
- 16-bit 3D Waveable stereo soundcard w/2MB RAM.....\$99*
- Advent NV270 Powered Partners stereo speakers.....\$99
- Advent NV370 Powered Partners stereo speakers w/subwoofer.....\$199
- Microsoft® SideWinder™ 3D Pro joystick.....\$59



Microsoft
WHERE DO YOU WANT TO GO TODAY?™

STORAGE/MEDIA OPTIONS

- Adaptec 2940U Ultra SCSI Fast-20 controller.....\$100
(upgrade from system with standard Ultra SCSI Fast-20 controller)
- Plextor 8Plex BX 1.2MB/S SCSI internal CD-ROM drive.....\$200**
(upgrade from systems with standard 8X EIDE CD-ROM drive)
- Iomega Jazz JZ51 drive with 1.0GB removable cartridge.....\$399**
- Iomega Zip IDE drive with 100MB removable cartridge.....\$99
- Iomega Ditto 800 (400/800MB) Travan Tape back up w/tape.....\$149
- Iomega Ditto 3200 (1.6/3.2GB) Travan Tape back up w/tape.....\$199
- Sony 4/8GB DDS-2 DAT SCSI Tape back up w/tape.....\$999**



COMMUNICATION OPTIONS

- 28.8kb V.34 internal data/fax modem.....\$139***
- 28.8kb V.34 internal telephony data/fax modem w/full duplex speakerphone and voice mail.....\$159****†



NETWORKING OPTIONS

- 3Com® 3C509 Ethernet ISA NIC (BNC, AUI & RJ-45).....\$99
- 3Com 3C595 Fast Etherlink PCI 10/100 NIC (RJ-45 only).....\$159
- 3M IC TokenCard network card.....\$199

* Upgrade from systems with standard 16-bit stereo sound card
 ** Requires SCSI Host Adapter
 *** V.34 modem includes trial memberships to CompuServe®, Prodigy® and America Online®
 † Requires sound card
 ‡ Upgrade from systems with standard Micron 17" 1776X color monitor
 †† Upgrade from systems with standard 64-bit 2MB video card

Options and accessories available with systems purchase only.

QUICKEN® FINANCIAL PAK

- Quicken Financial Pak, including: Quicken Deluxe 5.0; Quicken Financial Planner™; Quicken Parents' Guide to Money™; Quicken Family Lawyer™.....\$69



DISPLAY/VIDEO OPTIONS

- 17" Hitachi SuperScan 1711 (15.9" display) 26dp color monitor.....\$150 ††
- 21" Hitachi SuperScan 2111 (20" display) 26dp color monitor.....\$1,050 †††
- Diamond Stealth64 video card w/2MB VRAM.....\$150 †††
- Diamond Stealth64 video card w/4MB VRAM.....\$300 †††
- #9 Imagine 128 series II video card w/4MB VRAM.....\$500 †††
- #9 Imagine 128 series I video card w/8MB VRAM.....\$750 †††

MILLENNIA TRANSPORT™ OPTIONS

- MicronDock™ multimedia port replicator: Ethernet LAN adapter, SCSI-2port, S-Video and NTSC video output, built-in stereo speakers, infrared port, headphone, microphone, line-in jacks, parallel, serial, VGA and 2 PS/2 ports.....\$299
- MicronExec™ desktop package: Matching black 17" monitor (15.8" display) with matching black mouse, mousepad and keyboard (can be used with or without MicronDock).....\$799
- Motorola Montana 28.8 fax/modem supports regular telephone connections, cellular phones and two-way paging devices.....\$299



SERVICE OPTIONS

- Extended 2-year on-site service coverage for desktop systems (upgrade from optional 1-year on-site service coverage).....\$99
- Extended 3-year on-site service coverage for desktop systems (upgrade from optional 1-year on-site service coverage).....\$139
- Complete on-site PC installation (call Micron for details).....\$159

OTHER OPTIONS

- APC Per77 surge suppressor.....\$39
- APC Pro77 surge suppressor.....\$59
- Microsoft Natural Keyboard® (upgrade from standard keyboard).....\$49

• 900 E. Kärcher Road, Nampa, ID 83687
 • Mon-Fri 6am-10pm Sat 7am-5pm (MT)
 • International Sales Hours: Mon-Fri 6am-7pm (MT)
 • 208-893-3434 • Fax 208-893-3424
 • Purchase Order Fax 208-893-8992
 • USA Contract #653345170
 • Technical Support Available 24 Hours A Day-7 Days A Week
 • Technical Support E-mail: techsupport.mic@micron.com


MICRON™
ELECTRONICS, INC.

800-707-2329

<http://www.mei.micron.com>

Our Cross-Platform Solution Has Proprietary E-Mail Licked.

Industrial-strength e-mail plus Internet access in one affordable package.

 NetManage Z-Mail™ is a complete solution based on open Internet standards. Send mail—including files—to all users in your enterprise and over the Internet. You can even send attached image, sound, video, database and spreadsheet files. And there are extensive off-line features for remote and mobile users.

Z-Mail brings powerful standards-based messaging to the broadest set of platforms.

Administration is simple. Scripting lets you integrate Z-Mail with existing applications and create custom mail filters and rules. It eliminates expensive mail gateways.

So your cost of ownership is exceptionally low.

Z-Mail is part of the NetManage IntraNet Family—a full suite of products designed to help you build a powerful corporate IntraNet. Call now and GO! IntraNet today.

5 FREE Z-MAIL CLIENTS!
with every server purchased
before 11/30/96.

Download 30-day trial
software from our website.

1-408-342-7535



- Completely standards-based for the highest degree of present and future connectivity.
- Z-Mail Servers for Windows 95, NT and UNIX.
- Z-Mail Clients for Windows 3.1, 95 and NT, UNIX and Macintosh.
- Simple to install, setup and administer.
- Comprehensive solution for an exceptionally low price.

 **NETMANAGE®**
WE KNOW THE NET. INSIDE AND OUT.



sales.pci@netmanage.com
www.netmanage.com

© 1996 NetManage Inc., 10725 North De Anza Blvd., Cupertino, CA 95014 U.S.A. Fax: (408) 257-6405. UK: +44 1483 881800; Israel: +972 (0)4-8550234; Germany: +49 (0) 8165/9470-0; France: +33-1-47 72 08 08; Japan: +81 (0) 3-3221-8400. Specifications are subject to change without notice. All trademarks are property of their respective companies. GO! IntraNet, NetManage and Z-Mail are trademarks or registered trademarks of NetManage Inc.

CIRCLE 275 ON READER SERVICE CARD

PERFORMANCE TESTS

Netscape Navigator renders most HTML pages faster than Internet Explorer over both LAN and modem connections. On some real-world pages, you'll notice the difference.

By Larry Seltzer

It's no shutout, but overall, Netscape Navigator 3.0 is faster at rendering HTML pages than Microsoft's Internet Explorer 3.0. Navigator's lead is most noticeable in LAN-based testing: In no case did Internet Explorer load a complete page as quickly as Navigator. As a rule, Navigator was also much faster at reloading pages from its cache. Over a modem connection, each browser led in some tests, but usually by an insignificant margin.



These differences will be even less noticeable with real Web pages than our tests might indicate, especially at modem speeds. But in some cases, they will make themselves felt.

TESTING BROWSERS

We tested both browsers on a private IP network using a standard Web server. We connected to the server both directly over a 16-Mbps Token-Ring network and over a 28.8-Kbps modem through a Windows NT

PPP RAS server, also on the network.

Instead of simply measuring the time for the page to load, we captured three results: the time needed to display the first usable element, the time needed to load the complete page, and the time needed to reload the page from the browser's cache. We cleared the cache and restarted the browser between each test.

Instead of testing with real-world Web pages (which, at network speeds, loaded almost instantaneously in both browsers), we created a series of 13 highly stressful synthetic pages.

The Formatted Text and Links page is a 570K HTML file containing text and a large number of hyperlinks. Internet Explorer took consistently longer than Navigator to load the complete page.

The Graphics and Formatted Text I test document contains 480K of .GIF images and 37K of HTML. Again, Internet Explorer was slower. Over a modem, Internet Explorer also had more trouble than expected loading the first element quickly (the first element in the page is a large graphic that extends below the bottom of the first screen). The Graphics and Formatted Text II test document is small-

| Seconds | Modem Connection Tests | | | LAN Connection Tests | |
|--------------------------------|------------------------|----------------|-------------------|----------------------|----------------|
| | First usable content | Full-page load | Reload from cache | First usable content | Full-page load |
| Formatted Text and Links | 1.3 1.6 | 45.4 30.8 | 17.4 9.1 | -0 -0 | 43.3 6.9 |
| Graphics and Formatted Text I | 41.3 30.4 | 165.2 153.8 | 24.8 12.2 | 2.9 3.2 | 26.4 12.7 |
| Graphics and Formatted Text II | 1.7 1.7 | 53.9 61.9 | 5.1 2.6 | 1.5 -0 | 5.3 2.4 |
| Very Long Text and Graphics | 1.5 1.4 | 18.3 17.6 | 4.7 1.4 | 1.9 -0 | 1.9 1.7 |
| HTML Controls | 36.2 1.1 | 36.2 17.7 | 22.8 4.6 | 35.3 -0 | 35.3 4.3 |
| GIFs | 4.7 6.5 | 64.2 65.2 | 8.6 3.1 | -0 2.1 | 4.0 2.1 |
| GIFs in Table | 5.1 64.2 | 64.1 64.5 | 9.1 3.1 | 4.5 2.1 | 4.5 2.1 |
| GIFs in Frames (Horizontal) | 5.3 49.0 | 66.0 81.6 | 8.7 3.3 | 4.0 2.0 | 5.1 2.0 |
| GIFs in Frames (Vertical) | 5.3 5.4 | 66.2 78.2 | 8.7 3.2 | 1.5 2.1 | 5.3 2.1 |
| JPEGs | 7.3 9.2 | 134.5 131.5 | 8.0 3.3 | -0 2.8 | 4.5 2.8 |
| JPEGs in Table | 6.7 129.5 | 136.5 131.5 | 8.1 3.3 | 5.1 2.8 | 5.1 2.8 |
| JPEGs in Frames (Horizontal) | 6.0 100.4 | 132.4 162.8 | 8.4 3.6 | 2.0 2.9 | 4.8 2.9 |
| JPEGs in Frames (Vertical) | 6.4 7.7 | 132.2 112.8 | 7.2 3.7 | 3.9 2.9 | 5.2 2.9 |

-0 represents a timing too short to be measured accurately.

er and contains both .GIFs and HTML. The Very Long Text and Graphics test page is more text-heavy and contains fewer graphics than the previous two tests. Navigator was generally faster in both.

Our HTML Controls page is extremely stressful: It contains 100 buttons, 100 radio buttons, 100 check boxes, 100 password-entry fields, and 100 list boxes, each populated with 100 elements. This test proved disastrous for Internet Explorer, which took more than twice as long as Netscape Navigator to load the full page. Surprisingly, Internet Explorer was unable to display a first element until it had loaded the entire page; Navigator was able to display the first element in just over 1 second.

Once Internet Explorer had loaded the HTML Controls page, we noticed that free Windows 95 user resources had dropped to 34 percent (Navigator left us with 55 percent free, a significant difference). Internet Explorer's difficulties in loading large numbers of controls are severe enough to affect its performance with real-world pages.

GRAPHICS TESTS

Our remaining eight tests concentrated on graphics. All are based on the same series of 51 images, formatted as both .GIFs and JPEGs. The basic .GIF and JPEG test pages load the images in 17 rows of three images each. In the two table tests, they are loaded as elements in a table with 17 rows and three columns. In the four horizontal and vertical frame tests, they are loaded in three frames containing 17 images each.

Over a modem, differences between the browsers in full-page loads were minimal, although Internet Explorer was consistently faster at rendering the first usable graphic. When the graphics were in a table or in horizontal frames, Navigator was unable to display any graphic until it had loaded almost the entire page.

Over a network, Navigator proved consistently faster than Internet Explorer at loading full pages. Navigator was not able to display initial elements, however, before rendering the entire page. In the simple .GIF and JPEG tests, Internet Explorer was able to display a usable graphic very quickly. But on some frame and table tests, Navigator was able to render an entire page before Internet Explorer rendered the first usable element.

WHY WE DON'T TEST ON THE INTERNET

We considered and rejected the possibility of testing across a live Internet connection. As attractive as this approach seems, results from such tests are meaningless. Conditions on the Internet are inherently unreproducible. It is next to impossible to know the conditions of the test, and those conditions are in constant flux.

For example, the first time you load a page from a remote server, the file may be read from the server's disk into a page cache. The page may also be routed through a proxy server, which will cache

the contents. Either way, a second page request will be serviced much more quickly than the first. It is also possible that a cache could be flushed between accesses. An even bigger problem is the fact that IP routing on the Internet can vary enormously, not only among longer or shorter routes with larger or smaller numbers of lines, but among faster or slower lines. Two requests for the same page will often travel different routes. Only by testing on a closed IP network are we able to deliver meaningful and repeatable results.

COLLABORATION TOOLS

Internet collaboration is a standard feature of both browsers. But application sharing and a state-of-the-art Internet telephone give Internet Explorer the edge.

By Jan Ozer

Internet collaboration gets a big boost from its inclusion in both Microsoft Internet Explorer and Netscape Navigator as a standard browser feature. On the surface, Internet Explorer's NetMeeting and Navigator's CoolTalk look quite similar. Both offer point-to-point Internet telephone and a variety of collaboration modules. But scratch a bit deeper and you'll find considerable differences in approach.

NetMeeting is a business-oriented, multiparty collaboration program that offers high-quality audio and efficient Windows application sharing. CoolTalk is a consumer-oriented Internet phone with somewhat sketchy audio quality, supported by some collaboration applications.

NetMeeting is clearly superior for business applications, and many consumers will prefer its higher audio quality even over CoolTalk's attractive voice mail feature. In the longer term, Mi-

crosoft's support for the rapidly coalescing International Telecommunications Union (ITU) T.120 conferencing standard promises compatibility with products from more than 20 other vendors. CoolTalk users must pin their interoperability hopes on Netscape's own Internet Interactive Collaboration Environment (IICE).

AUDIO CONFERENCING

Internet phones use lossy coder/decoder (codec) software algorithms to compress audio data prior to transmission and to decompress and play it at the receiving end. Audio quality is highly dependent on codec quality. Another key concern is the robustness of the technology during normal conversations across a full-duplex (two-way) connection. If your link is marred by frequent breaks, or audio gaps, conversations take on an uncomfortable CB radio-like feel.

Both CoolTalk and NetMeeting offer



OUR EDITORS REVIEWED 100,000 WEB SITES SO YOU WON'T HAVE TO!

LUCKMAN'S

OFFICIAL INTERACTIVE

World Wide Web

YELLOW PAGES

10,000 of the Best Sites on the Web

Site Ratings Include Download Time

Detailed Site Descriptions

Offline and Online Searching

PC & Mac CD-ROM \$59.00 SRP

Fast & easy access to the best of the Web!



Luckman's Official Interactive World Wide Web Yellow Pages™ is the easiest, most useful Web site directory available for the Internet. Of the more than 100,000 sites on the Web, our editors have found, reviewed, rated, and compiled over 10,000 of the very BEST.

A built-in search engine locates sites by category, name, description, keyword or site rating. A mouse click on the site name or URL automatically connects you to the Internet, launches your browser and takes you to the Web site. Call today: 1-800-711-2676

E-Mail: info@luckman.com <http://www.luckman.com> 1055 West 7th Street, Los Angeles, CA 90017

Luckman Interactive, Inc.™

©1996 Luckman Interactive, Inc. All rights reserved. Luckman's Official Interactive World Wide Web Yellow Pages is a trademark of Luckman Interactive, Inc. All others are trademarks of their respective owners. Screen shot reprinted with permission from Microsoft Corporation.

CIRCLE 009 ON READER SERVICE CARD



| | | |
|------|----------------------------|-----------|
| Fair | Internet phone | Excellent |
| Good | Text chat | Good |
| N/A | Application sharing | Excellent |
| N/A | File transfer | Good |
| Fair | Whiteboard | Good |
| Fair | Phone user listing | Good |

N/A—Not applicable. The product does not have this feature.

Internet phone refers to voice quality over a 28.8-Kbps line and the absence of audio breaks or excessive dropouts during full-duplex conversation. **Text chat** covers the power and ease of text-based chat over a modem connection. **Application sharing** covers the ability of multiple conferees to view and control a Windows application running on a remote computer over a modem connection. **File transfer** covers the power and ease of file transfer over a modem connection. **Whiteboard** covers the ability to draw, mark, write, and annotate a whiteboard screen in near-real time. **Phone user listing** covers accessibility and ease of use of the vendor's publicly available listing of connected phone users.

multiple compression technologies for varying bandwidths. We tested them over connections ranging from 28.8 Kbps to 10 Mbps. To test robustness, we carried on a scripted two-way conversation over an Ethernet LAN, taping audio output at both ends to spot audio breaks.

In terms of pure quality, NetMeeting was superior at all bandwidths. At 28.8 Kbps and above, it produced audio that matched the quality of a long-distance call. More importantly, NetMeeting proved much more robust than CoolTalk, suffering very few noticeable breaks. CoolTalk conversations were marred by frequent audio breaks that forced us to speak slowly and carefully to make ourselves understood.

CoolTalk is one of the few Internet phones to offer answering-machine capabilities. While the feature worked as advertised, it's of limited value to those with dial-up Internet connections, since the connection must be active for callers to leave a message. Those with LAN-based connections to the Internet may find it useful.

Both products offer online directory listings of fellow users along with easy one-

button dialing. NetMeeting is also compatible with several third-party Internet white-page services, including Bigfoot Partners, Four11, InfoSpace, Coordinate.com, and WhoWhere. Microsoft's own listing servers are easier to access and more useful than Netscape's, having fields for e-mail address, first and last name, city/state, country, and comments, along with the ability to sort on any field. CoolTalk directory entries are limited to name and e-mail address, and the server was frequently too busy to access during our testing.

COLLABORATION TOOLS

Internet collaboration is a fairly new concept. The gamut of collaboration modules includes whiteboard products, text-based chat windows, and file-transfer utilities. Most impressive are application-sharing programs, which let several users share an application across an Internet link to work collectively on a document.

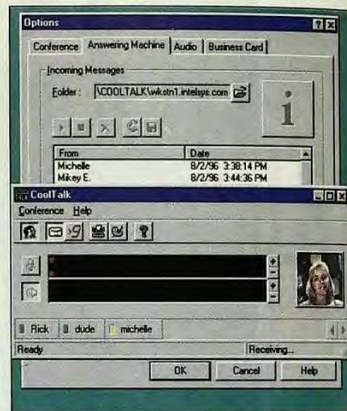
The first consideration in collaboration is scope: How many people can work together at one time? Where both products are limited to two-party audio communications, NetMeeting's other collaborative functions can be accessed by multiple participants. CoolTalk's modules are strictly two-party throughout.

Next to consider are the collaborative functions provided. Both products provide whiteboard and chat, but only NetMeeting offers application sharing and file transfer. Using NetMeeting, we were able to group-edit a memo written in Word, review an expense report in Excel, and contribute to a presentation developed in PowerPoint. The feature worked flawlessly at 28.8-Kbps bandwidths, opening application sharing to traveling co-workers.

Whiteboard utilities emulate the function of the ubiquitous conference-room whiteboard. NetMeeting's and CoolTalk's whiteboards resemble simple image-editing programs, and both

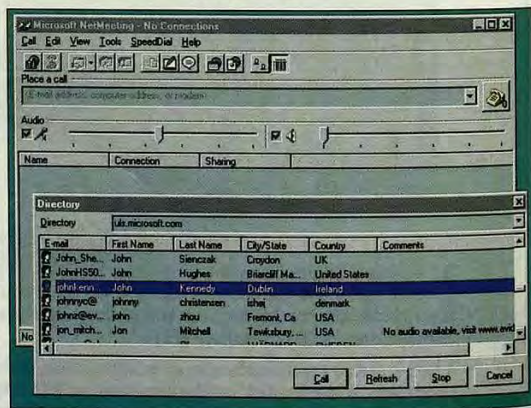
perform the same basic function, transmitting drawings, images, and annotations to other conferees in real time.

CoolTalk limits you to a single 640-by-480 surface, while NetMeeting supports multiple pages of much larger resolution. All annotations made in the CoolTalk canvas are final: You can erase, but you can't edit. In contrast, NetMeeting maintains all images and



Netscape's CoolTalk includes a point-to-point Internet telephone with answering-machine capabilities.

markings separately, so you can move them around without erasing. Differences between the products' chat utilities were much less significant, although NetMeeting has a slight edge. Overall, NetMeeting sets high standards for Internet collaboration, which CoolTalk must work hard to meet.



Users of the Internet telephone in Microsoft NetMeeting can find each other through listings on a Microsoft-maintained server.

7.9 billion miles of open highway
and you've got TotalAccess.™



\$19.95 flat rate.* Unlimited Internet mileage.



The coolest, easiest Internet access on Earth.

Every account includes e-mail and a free 2 meg Web site.

Call now for your EarthLink Network TotalAccess™
software with Netscape Navigator™ 2.0.

1-800-395-8425



Internet access in over 290 cities in the U.S. and Canada. Software for MACINTOSH, WINDOWS, WINDOWS 95, featuring Netscape Navigator 2.0. EarthLink Network is one of the largest Web space providers in the U.S. and also provides ISDN, Frame Relay, T1 and other Internet services. *There is a one-time set-up fee of \$25.00. Prices for Canada are different.



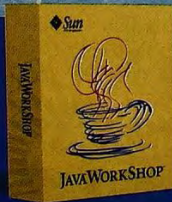
EarthLink Network, Inc. 3100 New York Drive, Pasadena, CA 91107 Fax: 818-296-2470
Info via email: info@earthlink.net Live human via email: sales@earthlink.net Visit our Web site at <http://www.earthlink.net>
CIRCLE 225 ON READER SERVICE CARD

Copyright ©1996 EarthLink Network, Inc. All Rights Reserved. Trademarks are property of their respective owners. Netscape Communications, Netscape Navigator and the Netscape Communications logo are trademarks of Netscape Communications Corporation. ©1996 PhotoDisc.

OFFER GOOD THRU 12/31/96 IN U.S. & CANADA ONLY. © 1996 SUN MICROSYSTEMS, INC. ALL RIGHTS RESERVED. SUN, SUN MICROSYSTEMS, SUN LOGOS, JAWORKSHOP, JAVA, JAWORKSHOP SQUARES & THE NETWORK IS THE COMPUTER ARE TRADEMARKS OR REGISTERED TRADEMARKS OF SUN MICROSYSTEMS, INC. IN U.S. & OTHER COUNTRIES. JAW15



Java development tools from Sun.



Leave it to the creators of the Java™ platform to give you Java Internet. Making it easier & faster to develop Java applications. \$99* gets you Java Workshop and all the upgrades for a year.

If you're not creating Internet applications on the Internet,
you're someplace you shouldn't be.



WorkShop™. The only way to create and test Internet applications where they'll run, on the
plus it's written in Java, so you can develop on Solaris™, Windows 95 and Windows NT.
contact 1-800-SUNSOFT or www.sun.com/developer-products/ **THE NETWORK IS THE COMPUTER™**



CIRCLE 335 ON READER SERVICE CARD

Add speed and sophistication to your search engine.



Introducing EchoSearch,™ the revolutionary new search accelerator.

In about the same time it takes to use one engine, EchoSearch harnesses *multiple* search engines such as WebCrawler, Lycos, Alta Vista and others. So you find what you want faster and easier.

EchoSearch also searches via *ideas*, rather than just words! Special linguistic programming selects and prioritizes the most relevant lists for your review.

You no longer pull up list after list of hits that are unrelated to what you're looking for – what a civilized idea!



Winner

At just **\$49.95** EchoSearch is the intelligent choice for prowling the Internet.

Download a full-featured free evaluation copy at

<http://www.iconovex.com/esm4/>

Or for credit card orders call

1-800-896-4212

(\$49.95 plus shipping & handling)



ICONOVEX
An Innovex Inc. Company

Software That Understands Ideas.

EchoSearch is a registered trademark of Iconovex Corporation, all other trademarks are property of their respective holders.

CIRCLE 024 ON READER SERVICE CARD

YOUR BROADCAST STATION TO THE INTERNET

LUCKMAN'S

WEB COMMANDER™

FULLY SECURE WEB SERVER - EASY TO SET UP - EASY TO USE

Full Security
S-HTTP and SSL

WebStudio
HTML authoring tool
including dozens of home
pages, templates & forms

Browsers
Microsoft Internet Explorer
Spyglass' Enhanced Mosaic

Image Map Editor

Real Time Monitoring
Reporting & Logging

ODBC Connectivity

Excite & WAIS Search engines

POP3/SMTP Mail server

Multi-Domain server

Web Tree graphically displays
all documents & links

PERL support
for CGI scripting

Automated credit card
clearing & verification

The Java Developer's Kit



Now

YOU CAN HAVE:

MORE EXPOSURE

MORE VISIBILITY

MORE BUSINESS

BY PUBLISHING

ON THE WEB

Web Commander has it all.
Completely wizard driven, Web Commander is the fastest,
easiest to configure server software on the market with
all the tools for fully secure business on the Internet.

WINDOWS 95 \$ 129.00 SRP
WINDOWS NT \$ 249.00 SRP



Luckman Interactive, Inc™

Call Today:
1-800-711-2676
E-Mail: info@luckman.com
<http://www.luckman.com>
1055 West 7th Street, Los Angeles, CA 90017

CIRCLE 006 ON READER SERVICE CARD



SLmail95

excite
for Web Servers

©1998 Luckman Interactive, Inc. All rights reserved. Web Commander, WebStudio, Luckman Interactive and the Luckman logo are trademarks of Luckman Interactive, Inc. All others are trademarks of their respective owners.

If you could
drive all your
TCP/IP applications
through one
easy-to-use interface,
what would you have?

Time to do your job.

tcpCONNECT4™
Check it out.

www.intercon.com/200/

Network managers everywhere are finding life more manageable thanks to InterCon's new tcpCONNECT4™ Communications Environment. CONNECT4 integrates the configuration and operation of everything from email and Web browsing to file sharing and terminal emulation under one simple, intuitive

interface for both Windows and Mac. Training and support are radically reduced. Users become more productive. Call InterCon at 1-800-468-7266, dept. 200 or visit our Web site for a free trial copy. The tcpCONNECT4 Communications Environment from InterCon. Do less work, get more done.

©1996 InterCon Systems Corporation. All rights reserved. tcpCONNECT4 is a trademark of InterCon Systems Corporation.

CIRCLE 166 ON READER SERVICE CARD

MAIL AND NEWS

Internet mail and Usenet news clients aren't the highlights of either browser. But they're well integrated, functional, and likely to get better. Here's what they offer.

By Amarendra Singh

In recognition of the importance of the Internet's two most widely used applications, Netscape Navigator 2.0 was the first browser to integrate Internet mail (POP3/SMTP) and Usenet news (NNTP) clients. Now, better late than never, Internet Explorer 3.0 brings mail and news capabilities to Microsoft's browser.

Neither company's offerings will take the place of full-featured Internet mail and news applications. But both companies include mail and news capabilities free with their browsers, and both deliver basic functionality with the occasional nice twist.

The mail and news clients included in Navigator 3.0, although not significantly enhanced beyond the previous version, exhibit an intriguing HTML-centric conception that is not yet strongly implemented. Microsoft's clients push the envelope less but are somewhat more polished in their current state.

Both sets of mail and news clients are designed to look and feel very much like the companies' respective browsers. Both use a three-pane interface to display different message elements. Navigator's clients do not allow you to remove any of these elements; Internet Explorer's clients let you hide all but the message headers. To view postings, you highlight a message header; the message's contents are displayed in the message pane.

The two browsers' mail and news clients have many family resemblances and common features. Within Internet Ex-



plorer, messages containing an attachment appear with a paper-clip icon on the upper right-hand corner of the message window. Unfortunately, you have only the option of executing the file through the appropriate application. That's not very useful for saving executable files. If a file is split into multiple parts, however, you can select all the messages that comprise the file, decode them, and then save the resulting file. Netscape offers you the options of viewing attachments in-line or as an icon in the message pane.

Both browsers' news clients let you specify the number of message subject headers you want to download. The Internet Explorer client makes it easy to load additional messages by choosing a menu option; in Navigator, you need to close and then reload the group. The Navigator client provides greater control over the amount of detail shown in NNTP message headers, such as where a message was cross-posted and from what news server it originated. Most of the reply options, such as replying to all and including the original message in the reply, are standard. Neither mail client supports mailing lists or blind copies. Internet Explorer has limited sorting capabilities in its mail facility.

Navigator's news reader dedicates a certain amount of screen real estate to listing all newsgroups. The Internet Explorer news reader, called Microsoft Internet News, displays the list in a separate window, thus saving space. The downside of this approach is that you have to launch

a separate dialog to view unsubscribed groups. The dialog provides a tabbed dialog box to differentiate among the full list of newsgroups, the lists to which you have subscribed, and the new groups on your server. Internet Explorer's news reader offers superior off-line browsing. You can mark headers for later retrieval or create batch posts for specific groups.

RICH MAIL

Both Microsoft and Netscape say their mail clients support HTML, a somewhat vague and confusing claim. Navigator's mail client can view HTML attachments in-line with the actual message, but it cannot directly create HTML mail. Both packages can turn an embedded URL into an active link. Internet Explorer's client supports rich text, which it can convert to a basic HTML equivalent, but you can't insert images or use advanced HTML features.

Ultimately, the mail and news offerings from both companies fall short of the mark, while holding out the promise of something better. We'd like to see full HTML creation added to the Navigator clients' HTML-viewing capability. And we'd like to see Internet Explorer's weak HTML creation and rendering facilities beefed up to cover the full range of formatting possibilities. □

| MAIL AND NEWS | | |
|---------------|------------------------------|------|
| Excellent | Browser integration | Good |
| Poor | Message management | Fair |
| Fair | Newsgroup management | Good |
| N/A* | Off-line news reading | Fair |
| Fair | Rich messaging | Fair |

N/A—Not applicable. The product does not have this feature.

Browser integration covers the quality of integration between the mail and news clients and the host browser. **Message management** covers the mail package's ability to organize and manage mail and filter messages. **Newsgroup management** covers the ease with which the news client lets you access, view, and subscribe to newsgroups. **Off-line news reading** covers features that let you work with newsgroups while not connected to the Internet. **Rich messaging** covers the ability of the mail package to create and view HTML and other rich-text messages, view complex HTML in-line, and access hyperlinks.