Ancient systems put scare in air

By Gary H. Anthes
WASHINGTON

Recent disasters have trained a harsh spotlight on air safety and its patron, the Federal Aviation Administration. But the beleaguered FAA is sitting on another ticking bomb: an aging air traffic control system is "on the ragged edge" of acceptable safety.

Many aviation experts cite an elaborate system of automated and manual backups as evidence that the nation's air traffic control system is safe. But critics point to a growing number of failures among decades-old computer systems and flaws in the backup systems as signs that safety is deteriorating.

"The system is basically broken; it's not as safe as it could be, should be or was," said Robert Charette, a computer risk specialist and president of ITABI Corp. in Fairfax, Va. "Earlier, we would have been very unlucky to have an accident caused by these systems going out. Now, we're lucky if something doesn't happen."

"Our position is the system remains safe, but it definitely is FAA, page 28

WHAT'S INSIDE

- Users increasingly turn to help desk outsourcers. See stories, page 8, by April Jacobs and Julia King.
- Internet laggard IBM struggles to catch up. See stories, page 12, by Michael Goldberg and Craig Stedman.
- Multiprocessor Macintoshes and the PowerPC take Macworld Expo stage. See stories, page 14, by Lisa Picarille and Bob Francis.

Switch, hub makers woo ISP market

By Bob Wallace

To boost slowing revenue, internetworking vendors are trying to bust in to the Internet service provider equipment business — a strategy switch that could translate into less downtime and more reliable links to the Internet for users.

But first, internetworking vendors and Internet providers must transcend the main obstacles to a quick and potentially lucrative marriage: limited cash, a dearth of engineering talent and inefficient InterSwitch makers, page 16

Cairo detoured
Microsoft recasts late NT upgrade as 'set of technologies'

By Justin Hibbard
BELLEVUE, WASH.

Executives at Microsoft Corp. are speaking in riddles about Cairo again. But the word play may signal a more manageable upgrade process for users.

At the company's financial analysts meeting last week, CEO Bill Gates and two top managers said publicly for the first time that the company's long-awaited object-oriented operating system — code-named Cairo — isn't a product, but a set of technologies, if not a "vision."

According to analysts, the switch is part of Microsoft's plan to move toward an "annuity" upgrade model rather than rolling out all-in-one upgrade packages, such as Windows 95. In an annuity model, users subscribe to an online update service and download new features as they become available.

According to Jesse Berst, founding editor of "Windows Watcher," a newsletter in Redmond, Wash., who Cairo detoured, page 93

Eyes on the enter-prize
Vague bid to open OLE elicits skepticism

By Frank Hayes

As Microsoft Corp. moves to surrender sole control of its key object technologies, some corporate developers wonder whether the software giant will become open enough to support true enterprise-level applications.

Openness is no academic concern for developers trying to build enterprise-level applications. They need tools that will link user PCs with distributed client/server systems and legacy mainframe applications. For that, multiphazard standards are crucial: If it won't connect, the system is wrecked.

But Microsoft, which has been locked out of those giant applications because its technology is viewed by many users as proprietary, seems baffled about how to loosen its grip on ActiveX and OLE. In separate announcements since IEEE, page 93

'net performance vow falls short

By Mitch Wagner

BE sure to read the fine print on performance commitments offered by Internet service provider ANS, a unit of America Online, Inc. ANS, one of the largest providers in the country, recently announced a plan under which it would commit to make its Internet-based virtual private network service available 99.5% of the time. The company also committed to 99.5% availability for its World Wide Web site hosting service.

But the commitments have lots of qualifications and hedges. They are so limited that the company won't even pledge that a Web site hosted by ANS will be accessible from user accounts at America Online. Vimal Solanki, a product marketing manager at ANS, explained that America Online leases dial-up connectivity from networking companies besides ANS. That puts parts of the America Online network outside of ANS control.

ANS won't even refer to the commitments as a "guarantee" — a word that ANS officials said implies more control than ANS actually promises.

But as limited as the ANS commitments are, they are a pioneering effort for an Internet service provider, according to analysts. ANS is offering, in writing, cash penalties if it fails to meet explicit stated performance *net performance, page 58
IBM, Apple rev up OpenDoc

By Sharon Gaudin

IBM and Apple Computer, Inc., late last week teamed up with Component Integration Laboratories and the Object Management Group to push a series of OpenDoc-related announcements on the eve of this week's Macworld Expo and Object Expo.

The announcement was prompted by recent criticism that OpenDoc has lost any momentum it once had. Executives from the four firms touted OpenDoc-based components, version updates and increased group memberships.

Anthony Brown, manager of object technologies marketing at IBM's Software Solutions Division, tried to spotlight OpenDoc's progress in the past eight months and flag components and partnerships that are on the way.

OpenDoc is an industry-standard architecture for plugging together software components to make distributed applications. Its main rival is Microsoft Corp.'s OLE (see story, page 1).

Components on the way

Third-party vendors will release 30 beta components for OpenDoc's OS/2-based architecture by fall, according to John Siltz, vice president of application development and object technologies marketing at IBM. Brown said the latest round of releases will include components that add speech capabilities to OpenDoc applications and charting and calendaring features.

IBM just a week ago announced it had two packages of components available on its ClubOpenDoc Internet site (www.software.ibm.com/chopendoc). Siltz also noted that OpenDoc for Windows, which went into beta testing this summer, will go into a second testing phase this month.

Also, an enhancement for OpenDoc for the Mac OS code, which was first released last November, is shipping, said Gina Centoni, product line manager at Apple. She said 16 products from third-party vendors, which are based on OpenDoc for Mac OS, will debut at Macworld this week.

IRS downsizing hits IS

The Internal Revenue Service last week said it will eliminate 5,000 jobs — including 1,500 in information systems — through layoffs, reassignments, early retirements and attrition. The IRS has cut its staff by 20% since it was founded and is downsizing again to save money.

Attention shoppers: There may be something to worry about.

Bingaman resigns

Microsoft Corp., critic and Assistant Attorney General Anne E. Bingaman resigned as head of the U.S. Department of Justice's Antitrust Division, effective no later than Nov. 15. She was accused of being close to Microsoft in her defense of an antitrust settlement seen by many as favorable to the software giant. She said her resignation was too early to say how that will be affected.

NEC denies dumping

Supercomputer maker Cray Research, Inc. last week filed a complaint alleging that Japan's NEC Corp. tentatively won a government contract by proposing to sell four systems at a $65 million loss. Officials at NEC denied the dumping charges.

Object, Java Expo opens

With object-oriented programming rapidly gaining momentum, this week's Object Expo in New York will target IS professionals looking to cash in on this new technology. Several vendors will announce object libraries, debuggers and Java tool sets. Show organizers also are launching the first Java Expo, which will be held in conjunction with Object Expo.

Lotus melds Notes, NT

Lotus Development Corp. last week revealed plans to tightly integrate Windows NT and Notes 4.5, the Notes upgrade due in September. The integration will ease administration by offering single sign-on, directory synchronization and a place to monitor performance of Windows NT and Notes.

New phone rules bow

The Federal Communications Commission last week released sweeping rules that will map out the future of local telephone competition. Analysts say the rules initially will provide an edge to long-distance carriers over local providers. But the long-distance carriers were disappointed that the FCC failed to address a key issue: whether to reduce the $25 billion per year they pay local companies to complete their long-distance calls.

AT&T, GTE cross wires

AT&T Corp.'s Wireless Data Division and GTE Corp. have agreed to jointly provide wireless data services to more than 65 million potential customers in 34 markets across the U.S. Starting in October, the pair will connect their wireless data networks, which will let corporate and individual customers send and receive data wirelessly within either firm's wireless data service area.

PC sales still rising

PC sales in the second quarter stayed on an upward path — sales increased 16.5% over the same quarter a year ago, according to Dataquest, a research group in San Jose, Calif. Compaq Computer Corp. was awarded a three-year, $11 million outsourcing contract to provide information technology services to L.A. Care Health Plan. The Open Group and Open User Recommended Solutions have agreed to work together in their respective task forces and working groups. Struggling PC maker AST Research, Inc. last week revealed losses of $89.7 million on revenue of $538.8 million in the second quarter. This is the company's ninth consecutive quarterly loss.
DEAR LOUISE: My son-in-law is the kind of person who keeps dropping by without calling first. Then he won't leave. He's a nice guy—some kind of computer manager—but he won't stop blabbing. Night after night, it's "distributed environments," and "legacy systems" and "networked computing." He's obviously troubled and looking for answers, but I can't help. I'm in laundromats. How do I get my life back?

LOSING MY PATIENCE

DEAR LOSING: Be gentle, but be honest. Your son-in-law needs serious help. If you're not up to becoming an overnight expert in his field, try tacking a note to your door: "www.software.ibm.com/is/enterprise/"

That's where he'll find instant access to all kinds of information about how other companies dealt with similar problems and found ways to run their businesses better. Or try earplugs.

DEAR LOUISE: I am a professional with years of experience when I read to my am

Find out exactly how other corporations have successfully implemented enterprise-scale networked systems. Visit our Web site at www.software.ibm.com/is/enterprise/ or call us at 1 800 IBM-2468*, ext. GA220, for an information pack. All questions answered.

*In Canada, call 1 800 IBM CALL, ext. 3033. The IBM word mark is a trademark of International Business Machines Corporation. © 1986 IBM Corp. All rights reserved.
Choice Cuts

Monticello Memoirs
Industry giants, including Seymour Cray, discuss the past and future.
See In Depth, page 67.

It's gonna cost you
Suddenly in high demand and low supply, AS/400 talent is commanding record-high salaries.
See Careers, page 71.

Technical Sections

SERVERS & PCS
Synchronized devices
Software allows data transfer and synchronization between the Pilot PDA and the desktop.

SOFTWARE
Swapping from suites
Some users move to less memory-intensive integrated software packages.

IBM, Lotus fight
IBM wants stepchild Lotus to adopt its OpenDoc technology. Lotus wants no part of it.

IBM, Lotus fight
IBM wants stepchild Lotus to adopt its OpenDoc technology. Lotus wants no part of it.

THE ENTERPRISE NETWORK
Closer Look:
E-mail integration
Companies struggle with too many E-mail systems and too few resources to make them work together.

Token Ring:
Get it together
Token Ring switch vendors need to cut prices to broaden the appeal to non-IBM shops.

THE INTERNET
Browse this, buster
While Netscape and Microsoft joust over which company supports the most leading-edge features, IS is looking at a much bigger picture. And the picture isn't pretty.

Firewalls
Internet firewalls grow more sophisticated.

CORPORATE STRATEGIES
Helping hands
IS volunteers help equalize access throughout Arizona to the Internet.

Features

MANAGING
Timing is everything
Firms are linking their decision-support and operational systems to react quickly to market trends — but it's not easy.

Bullish on IT
Paul Strassmann says U.S. companies spend three times more on IT than on basic industrial equipment.

September conferences

IN DEPTH
Monticello Memoirs
Computing pioneers assemble at Thomas Jefferson's home.

CAREERS
AS/400 talent
It's going to cost a lot to keep these hard-to-find folks around.

FINANCE & INVESTING
Online benefits
Mutual fund companies put 401(k) programs on corporate intranets.

Etc.

Company index 91
Editorial/Letters 32
How to contact CW 91
Inside Lines 94
Stock Ticker 90
For just $295* a user you can get the industry's most popular database server—Oracle7 Workgroup Server. With point-and-click installation, you can bring the power of the world's leading database to your business—simply. And with single-point management you can easily administer both remote and local database servers—across any operating platform, including NT or Unix.

The Oracle7 Workgroup Server. Easy to use. Easy to install. And easy to buy. Call Oracle at 1-800-633-0586, ext. 8137 today for more information. Or purchase directly from the Oracle Store at www.oracle.com/oraStore/welcome.html
Opening-day jitters hit Wal-Mart site

By Mitch Wagner

The grand opening of the Wal-Mart store in cyberspace had some glitches last week that caused slow service for customers.

The World Wide Web site for Wal-Mart Stores, Inc. (www.walmart.com) was plagued by mundane Internet problems that included insufficient server power, software errors and insufficient throughput on Wal-Mart's Internet connection.

The server slowed to a crawl as it was assaulted by 1 million hits on the online store's first day.

"I'm not impressed. I don't think this is good for business," said Scott Smith, an analyst at Jupiter Communications LLC in New York. "It looks like this is running on a 14.4 K bit/sec. line out of Wal-Mart's basement."

That is an inauspicious beginning for a site that Microsoft Corp. had touted as an upcoming standard-bearer for retail sales on the Internet. Last February, Microsoft CEO Bill Gates and Wal-Mart CEO David Glass announced that the two companies would jointly develop online commerce technologies. Microsoft said it would use Wal-Mart as a prototype for technologies it would remarket to other retailers.

Shared space

Problems started for Wal-Mart when the Web page opened for business Tuesday. The site shared a Hewlett-Packard Co. server with other applications, and access was through a single T1 line from AT&T Corp. that was shared with several other companies.

By comparison, other popular sites on the Web, such as Yahoo and Netscape Communications Corp.'s home page, typically run on servers dedicated and have multiple T1 lines dedicated to their use.

Information systems managers at Wal-Mart, based in Bentonville, Ark., worked until 1 a.m. Thursday moving the Web software and data to its own server and obtaining a dedicated T1 line from AT&T. The site was slightly faster on Thursday. Wal-Mart expects a larger server to be shipped from HP this week, said Phil Martz, director of Wal-Mart's online service.

Wal-Mart is sanguine about the experience. "We're awfully pleased, actually," Martz said. "It was a door that's only so large, and we've got hundreds of people trying to get through it."

Microsoft agreed. "They're working right now on tuning the site," said Mike Nash, group product manager.

Once the bugs are worked out, Wal-Mart officials said they hope the online store will sell more upscale items than those sold in the real-world stores.

"Historically, if we put a $99.95 Krups coffeemaker next to a $19.95 Mr. Coffee in our stores, our customers vote for the Mr. Coffee, and we have to take the Krups coffeemaker," Martz said. "Square footage isn't an issue online."

VAX's last hurrah?

Digital readies uniprocessor upgrade

By Jaikumar Vijayan

There will be at least one more VAX before the sun sets on this key player in minicomputer history.

Digital Equipment Corp. in Maynard, Mass., is prepping what some observers say may be the company's last significant VAX product upgrade announcement. The minicomputer product, code-named Catamount, is expected to ship in the fall. It will take its place between the VAX 4000 and the VAX 7000 series.

The VAX line is one of the earliest and most enduring legacies of Digital's proprietary minicomputer past. The product was first shipped in 1978. Analysts estimate that about 400,000 units have been installed since then.

The vast number of them ran mission-critical applications in manufacturing, engineering, scientific and educational institutions.

"I think it is going to be the VAX's last hurrah," said Terry Shannon, editor of "Shannon Knows DEC," a newsletter in Ashland, Mass. "But given that a significant proportion of the VAX base has already migrated to other platforms, I doubt it will create any undue level of angst."

Not dead yet

Digital last week confirmed that it is prepping a VAX upgrade for later this year, but a spokeswoman emphatically denied that it will be an end-of-life product.

"As long as there are people out there who still use these products, Digital will continue to support them," the spokeswoman said.

But users are reading a different sort of writing on the wall.

"I'm not going to be surprised at all if they start backing away from the VAX," said Rob Young, a software engineer at Vu/Text Library Services, Inc. in Philadelphia.

"They have carried it a long time, and they are most probably saying, 'We can't keep having new spins to this every four months or so,',' he said.

"Are going to be doing the last software upgrade to our VAX platform pretty soon," said David J. Foss, group leader of information technology at ICI Paints Co. in Strongsville, Ohio.

The company eventually will move to a Windows-based environment, and the hardware of choice is likely to be Alpha servers, he said.

Digital's newest VAX will feature up to 512M bytes of memory and larger 1/0 bandwidth and disk capacity than the VAX 4000 server series.

"It will support different speed processors and can be made to emulate either a VAX 4000 or a VAX 7000, depending on what silicon you stick into it," Shannon said.

The VAX has faded in importance since the early 1980s, when Digital focused its developmental and marketing dollars on its open, highly scalable Alpha server architecture.

"The total VAX contribution to Digital's total revenue is probably around 5% today. It's not a main stream effort for the company any longer, said James Garden, an analyst at Technology Business Research, Inc. in Hampton, N.H.

3-D model helps swing GOP vote to San Diego

By Stewart Deck

Forty-eight building columns stood in the way of San Diego winning the bid to host this month's Republican National Convention.

But city officials clinched the deal using a three-dimensional computer model that convinced skeptical GOP leaders that the city's convention center could do the job.

When Republican party officials were scoping out different convention venues two years ago, they were concerned about the San Diego Convention Center because it had 46 structural columns that could block the sight lines for 20,000 GOP convention-goers, recalled Tim Fitzpatrick, deputy press secretary for the Republican National Convention.

The city had just one month to come up with a convincing seating plan or else the Republicans would take their estimated $182 million convention elsewhere. So San Diego turned its problem over to Coryphaeus Software, Inc., a Los Gatos, Calif.-based developer of real-time, 3-D modeling software.

Jaye Capelin, a graphic artist at Coryphaeus, immersed herself in architectural blueprints, digital engineering files and scanned photographs of the convention center. For additional realistic touches, she scanned in the stage, podium and banners from past conventions.

Using Coryphaeus' Designers Workbench, Capelin assembled and built an interactive 3-D digital replica of the convention center — in two weeks — for Republican committee members to tour.

"We were able to show the committee the exact views of the podium from anywhere in the hall, including the worst seat and the best seat in the house," said T.J. Murray, vice president of marketing at San Diego Data Processing Corp., the city agency that commissioned the model.

"We took the model, committee members could walk through the hall, sit in any seat and see if those troublesome columns were in anyone's way," Murray said.

Building designers also discovered that their original plans for television network booths hung too low for audience to see the speaker's podium, so the booths were raised.

Then the broadcast networks used the model to find places for extra cameras. And where did they end up placing them? They went around the columns that caused all the trouble in the first place.

"Using the 3-D model, we were able to show that the columns were an asset to the hall, not a liability," Murray said.
WHEN YOUR CENTURY-DATE-CHANGE PROBLEM BECOMES BIG ENOUGH,
GIVE US A CALL.

Get Started Today With Micro Focus Challenge 2000

Now you can stop your century date change problem in its tracks. And there's only one set of tools that lets you do it yourself.

Micro Focus Revolve® and the Year 2000 Add-On™ provide all the tools you need to quickly and efficiently identify and fix your date problems across an entire system—all from within a single window on your PC. Then, you can compile and test changes back on the mainframe, or add the Year 2000 Compile and Test Option package to test those systems on the PC before sending them back up to your mainframe for production.

You can even choose to use Micro Focus' Challenge 2000 Consulting Services for project management expertise and expert training courses—all scaled to meet your individual needs.

You know us. As the 20-year leader in tools and services for developing and maintaining legacy systems, Micro Focus isn't about to let you get trampled by this oncoming problem. Let's head it off together right now.

Call Micro Focus and order Revolve and the Year 2000 Add-On package today. It's the only solution you need.
Call 1-800-632-6265 or visit us at http://www.microfocus.com.
Outsourced help desks ease staffing crunches

By April Jacobs

The lure of high-quality service on demand is drawing a growing number of companies into the world of help desk outsourcing.

"By relying on large multi-vendor databases, help desk outsourcers say they can save companies from adding staff as their computing operations become more complex.

Although only 15% of companies outsource any help desk services, analysts at Gartner Group, Inc. predict that number will grow to 40% by 1998. "The customer information services market, which includes help desk software and professional services, will grow from $1.25 billion this year to $2.76 billion next year, according to Aberdeen Group, Inc. in Boston.

For John Crane International, Inc. in Morton Grove, IL, outsourcing was the best option for supporting some 700 to 800 mobile users. "Our MIS department here is too small to provide round-the-clock service," said Desta Elliott, an internal consultant at Crane.

Other company systems remain under the care of the in-house information systems department, she added.

No personal touch
But the downside of help desk outsourcing is that a voice over the telephone can't always replace a personal visit to a user's desk. So handling over systems problems to a third party doesn't always solve them.

And outsourcing support doesn't necessarily cost less; companies need to keep close tabs on the outsourcer, said Colleen McCormick, a research analyst at Gartner Group in Stamford, Conn.

Outsourcing costs vary, but charges on a per-call basis generally range from $2 to $4 per minute, or $8.50 to $36 per user per month.

One potential nightmare of outsourcing is that a company might lose control of its help desk, leaving its IS staff out of touch with system problems, McCormick said.

"The successful outsourcing stories I've heard have been those where the internal group manages the outsourcer," she said.

Help desk outsourcing tips:

**Do**

- Make sure the outsourcer can provide you with audit trails and reports.
- Find ways to measure how much your clients will use the software you intend to outsource.
- Make sure the guidelines are clear about how the outsourcer will resolve problems.

**Don't**

- Allow an outsourcer to take over before it is familiar with your corporate culture and the skill level of your employees.
- Rely on an outsourcer to solve all your systems problems.
- Jump into a contract for services without a plan in place to change it if things don't work out.

The technical experts who man the help desk at Decision One field nearly 250,000 calls per month. Here is a sampling — honest — of some of the crazier requests they have received:

"I cleaned my keyboard, and now it doesn't work." Next time, don't immerse it in a bathtub.

"Help! The software won't work." Try unwrapping it and installing it in your computer.

"My computer won't fax." No, you don't fax from your computer by placing the paper in front of the monitor screen.

"What time does the Internet close? And please remember, I'm on West Coast time."

"My screen keeps telling me to hit any key, and I can't find the key labeled 'any.'"

Steady tone is key to customer support

By Julia King

"The caller on the other end of Mike Taylor's headed desk wants to know how he can electronically check his account balances at a New Jersey branch of Commerce Bank.

Never mind that the caller hasn't plugged in his modem. Taylor walks him through the installation, then gives him the customer's name and telephone extension — just in case he has any problems once he dials in to Commerce's online banking service.

Several rows of cubicles from Taylor, Errol McIntosh is speaking calmly and firmly to a caller who is getting a "serious disk error" message on her PC. He is calling from a large pharmaceutical company several hundred miles away.

McIntosh speaks with the steady authority of an air traffic controller guiding an inexperienced flier down from 30,000 feet.

"Now, what we're going to do … OK, now go to the document and name it something else so we can save it."

Throughout the 20-minute call, McIntosh consistently refers to the caller's dilemma as "our problem" and talks about how "we're" going to fix it.

Until the end of their shifts, Taylor and McIntosh will field dozens of such calls from users at companies that include Pillsbury Corp. in Minneapolis and AMP, Inc. in Harrisburg, Pa. Each company has outsourced its internal help desk operations to Decision One Corp. The company's 225-person support staff handles 225,000 calls per month.

Between calls or during the slowest periods — Saturdays and Sundays between 11 p.m. and 7 a.m. — Taylor might be found reading Tom Clancy's Debit of Honor or any one of several technology trade magazines stacked neatly on one corner of his desk.

Like McIntosh, he gets to surf the Internet for free. That is a favorite perk with staffers, many of whom started out their careers on a much different path.

Taylor, for instance, was a paramedic. He was studying to become a medical management but is now pursuing one in multimedia instructional technologies.

Chuck Adams, another support staffer, was a supermarket clerk.

Such diversity is common in the help desk business because "a service-oriented personality is much more important than technical skills," said Don Edwards, operations director for end-user and software support.

"It's much easier to teach staff the technical part of the job than the customer service piece," he said.
More and more, the world's top companies are depending on the high performance of PowerPC technology to develop their newest, most innovative products. It's a momentum that's changing computing forever. And it's why Sega, the world's number one computer game company, uses the advanced multimedia capabilities of PowerPC architecture. With it, their highly anticipated Virtua Fighter® 3 arcade game will have unprecedented lifelike characters and 3-D graphics. It's also why Honeywell uses PowerPC microprocessor-based systems running the Windows NT™ operating system for their new TotalPlant® Solution System for industrial automation. And PowerPC microprocessors give Data General the performance they need for their industry-leading CLARiiON® disk array mass storage systems. Call 1-800-845-MOTO, ext. CW, or visit http://www.mot.com/PowerPC/ to find out how PowerPC technology can give life to your most innovative product ideas.
New class of tools monitors network pulse

By Patrick Dryden

A new breed of network management software simplifies device and performance monitoring to warn administrators about impending problems.

The software includes tools coming next month from Kaspia Systems, Inc., a start-up in Beaverton, Ore., and others released by 3DV Technology, Inc. in Nashua, N.H.

They track standard statistics from inter-networking gear to create status reports. Those reports let administrators know where to point more sophisticated real-time monitors for preventive maintenance.

"We don't have the staff to interpret the plethora of information provided by all the tools. We want to get an early warning and summation, so we don't go down blind alleys searching for problems," said Steve Tindall, project manager at Baxter Health-care Corp. in Deerfield, Ill.

Such tools can supplement homegrown scripts and utilities that monitor performance by reading Management Information Base (MIB) data from routers, switches and hubs. And they reduce the cost and complexity of Remote Monitoring (Rmon) instrumentation.

"This could put us more in control by using management data already captured, as opposed to adding another layer of [Rmon] products," said Lawrence van Goethem, director of corporate telecommunications at Sara Lee Corp. in Chicago.

More powerful probes and analysis software provide complete reports on performance trends. Those are available from Rmon vendors such as Concord Communications, Inc. or Frontier Software Development, Inc. and from internetworking leaders such as Scom Corp. and Bay Networks, Inc.

But start-ups are taking a different approach to meet the management market's demand for easier network monitoring, said Brian Burba, an analyst at International Data Corp. in Framingham, Mass.

"This type of product builds up an automated reporting facility to show where to start looking [for developing problems], so managers don't have to wait for a red alert," Burba said.

Functionality overload

Most packages offer more functionality than users need, said Jim Ryan, network planner at the University of Massachusetts Medical Center in Worcester, Mass. "There are only a handful of critical factors you really watch. Beyond those, many products offer a lot of window dressing that we find we don't need," he said.

Administrators there and at organizations such as AlliedSignal, Inc. and Pacific Gas & Electric Co. said they create their own tools to track vital signs from MIBs.

Upcoming software from Kaspia Systems won't replace other management tools. They will just provide overnight analysis and present reports on network performance, said Kaspia President Jeff Irwin.

"We give the network manager a road map every morning that says which parts need attention, like unusually high utilization or other events," Irwin said. "It's a sophisticated smoke alarm."
New Sybase® SQL Server™ for Windows NT™ Bringing the power of the enterprise to workgroup PCs. Now there's a database for Windows NT with the power to reach beyond Windows NT. So you can interact with, distribute and replicate data all across your company—from the largest enterprise-class servers to the smallest notebook computers. And it does it all incredibly fast. New SQL Server for Windows NT. It's got scalability. It's got performance. And it doesn't have a ceiling.

Call today to order. Or for product and seminar information:
1-800-8-SYBASE code 29125 or http://www.sybase.com

©1996 Sybase, Inc. Sybase, System 11 and SQL Server are trademarks of Sybase, Inc. All other trademarks are the property of their respective holders. Outside the U.S., call 1-617-564-7333.
IBM cozies up to the Web – finally

New software aims to get mainframers on the net

By Michael Goldberg
NEW ORLEANS

IBM will begin a rapid-fire series of software releases next month intended to get more System/390 mainframe users on the Internet.

Users at the Share user group conference here last week said the faster IBM brings its mainframes in line with other Internet servers, the better.

"Making data available via the World Wide Web is one of the hottest things expressed to us by our department managers," said John Bevis, president of Share. Bevis also is manager of systems programming at the University of Florida in Gainesville.

Upcoming wares

By Sept. 30, IBM will unveil gateway software to let Web browsers access mainframe data via the Internet.

IBM will demonstrate MetaWeb, its Web server gateway to IMS applications by year's end. It promises similar things expressed to us by our department managers," said John Bevis, president of Share. Bevis also is manager of systems programming at the University of Florida in Gainesville.

Upcoming wares

By Sept. 30, IBM will unveil gateway software to let Web browsers access mainframe data via the Internet.

IBM will demonstrate MetaWeb, its Web server gateway to IMS applications by year's end. It promises similar things expressed to us by our department managers," said John Bevis, president of Share. Bevis also is manager of systems programming at the University of Florida in Gainesville.

Upcoming wares

By Sept. 30, IBM will unveil gateway software to let Web browsers access mainframe data via the Internet.

IBM will demonstrate MetaWeb, its Web server gateway to IMS applications by year's end. It promises similar things expressed to us by our department managers," said John Bevis, president of Share. Bevis also is manager of systems programming at the University of Florida in Gainesville.

Upcoming wares

By Sept. 30, IBM will unveil gateway software to let Web browsers access mainframe data via the Internet.

IBM will demonstrate MetaWeb, its Web server gateway to IMS applications by year's end. It promises similar things expressed to us by our department managers," said John Bevis, president of Share. Bevis also is manager of systems programming at the University of Florida in Gainesville.

Upcoming wares

By Sept. 30, IBM will unveil gateway software to let Web browsers access mainframe data via the Internet.

IBM will demonstrate MetaWeb, its Web server gateway to IMS applications by year's end. It promises similar things expressed to us by our department managers," said John Bevis, president of Share. Bevis also is manager of systems programming at the University of Florida in Gainesville.

Upcoming wares

By Sept. 30, IBM will unveil gateway software to let Web browsers access mainframe data via the Internet.

IBM will demonstrate MetaWeb, its Web server gateway to IMS applications by year's end. It promises similar things expressed to us by our department managers," said John Bevis, president of Share. Bevis also is manager of systems programming at the University of Florida in Gainesville.

Upcoming wares

By Sept. 30, IBM will unveil gateway software to let Web browsers access mainframe data via the Internet.

IBM will demonstrate MetaWeb, its Web server gateway to IMS applications by year's end. It promises similar things expressed to us by our department managers," said John Bevis, president of Share. Bevis also is manager of systems programming at the University of Florida in Gainesville.

Upcoming wares

By Sept. 30, IBM will unveil gateway software to let Web browsers access mainframe data via the Internet.

IBM will demonstrate MetaWeb, its Web server gateway to IMS applications by year's end. It promises similar things expressed to us by our department managers," said John Bevis, president of Share. Bevis also is manager of systems programming at the University of Florida in Gainesville.

Upcoming wares

By Sept. 30, IBM will unveil gateway software to let Web browsers access mainframe data via the Internet.

IBM will demonstrate MetaWeb, its Web server gateway to IMS applications by year's end. It promises similar things expressed to us by our department managers," said John Bevis, president of Share. Bevis also is manager of systems programming at the University of Florida in Gainesville.

Upcoming wares

By Sept. 30, IBM will unveil gateway software to let Web browsers access mainframe data via the Internet.

IBM will demonstrate MetaWeb, its Web server gateway to IMS applications by year's end. It promises similar things expressed to us by our department managers," said John Bevis, president of Share. Bevis also is manager of systems programming at the University of Florida in Gainesville.

Upcoming wares

By Sept. 30, IBM will unveil gateway software to let Web browsers access mainframe data via the Internet.

IBM will demonstrate MetaWeb, its Web server gateway to IMS applications by year's end. It promises similar things expressed to us by our department managers," said John Bevis, president of Share. Bevis also is manager of systems programming at the University of Florida in Gainesville.

Upcoming wares

By Sept. 30, IBM will unveil gateway software to let Web browsers access mainframe data via the Internet.

IBM will demonstrate MetaWeb, its Web server gateway to IMS applications by year's end. It promises similar things expressed to us by our department managers," said John Bevis, president of Share. Bevis also is manager of systems programming at the University of Florida in Gainesville.

Upcoming wares

By Sept. 30, IBM will unveil gateway software to let Web browsers access mainframe data via the Internet.

IBM will demonstrate MetaWeb, its Web server gateway to IMS applications by year's end. It promises similar things expressed to us by our department managers," said John Bevis, president of Share. Bevis also is manager of systems programming at the University of Florida in Gainesville.

Upcoming wares

By Sept. 30, IBM will unveil gateway software to let Web browsers access mainframe data via the Internet.

IBM will demonstrate MetaWeb, its Web server gateway to IMS applications by year's end. It promises similar things expressed to us by our department managers," said John Bevis, president of Share. Bevis also is manager of systems programming at the University of Florida in Gainesville.

Upcoming wares

By Sept. 30, IBM will unveil gateway software to let Web browsers access mainframe data via the Internet.

IBM will demonstrate MetaWeb, its Web server gateway to IMS applications by year's end. It promises similar things expressed to us by our department managers," said John Bevis, president of Share. Bevis also is manager of systems programming at the University of Florida in Gainesville.

Upcoming wares

By Sept. 30, IBM will unveil gateway software to let Web browsers access mainframe data via the Internet.

IBM will demonstrate MetaWeb, its Web server gateway to IMS applications by year's end. It promises similar things expressed to us by our department managers," said John Bevis, president of Share. Bevis also is manager of systems programming at the University of Florida in Gainesville.

Upcoming wares

By Sept. 30, IBM will unveil gateway software to let Web browsers access mainframe data via the Internet.

IBM will demonstrate MetaWeb, its Web server gateway to IMS applications by year's end. It promises similar things expressed to us by our department managers," said John Bevis, president of Share. Bevis also is manager of systems programming at the University of Florida in Gainesville.

Upcoming wares

By Sept. 30, IBM will unveil gateway software to let Web browsers access mainframe data via the Internet.

IBM will demonstrate MetaWeb, its Web server gateway to IMS applications by year's end. It promises similar things expressed to us by our department managers," said John Bevis, president of Share. Bevis also is manager of systems programming at the University of Florida in Gainesville.

Upcoming wares

By Sept. 30, IBM will unveil gateway software to let Web browsers access mainframe data via the Internet.

IBM will demonstrate MetaWeb, its Web server gateway to IMS applications by year's end. It promises similar things expressed to us by our department managers," said John Bevis, president of Share. Bevis also is manager of systems programming at the University of Florida in Gainesville.

Upcoming wares

By Sept. 30, IBM will unveil gateway software to let Web browsers access mainframe data via the Internet.

IBM will demonstrate MetaWeb, its Web server gateway to IMS applications by year's end. It promises similar things expressed to us by our department managers," said John Bevis, president of Share. Bevis also is manager of systems programming at the University of Florida in Gainesville.
It's amazing what data can do if you arrange it properly.

What computer company do you work with?

You should be working with Hewlett-Packard. HP's scalable Open Warehouse solutions, which combine best-in-class software with servers, consulting services and network and systems management, have helped thousands of companies around the globe put actionable information into the hands of the right users. If the business decisions are yours, the computer system should be ours.

Hewlett-Packard Computer Systems
PowerPC trio aims for 600-MHz chips

By Bob Francis and Lisa Picarille

What a long, strange chip it's been.

This week, IBM, Apple Computer, Inc., and Motorola, Inc. will lay out a revamped PowerPC road map in hopes of presenting a united front to challenge microprocessor powerhouse Intel Corp.

Analysts generally praised the group's plans, buy any hopes of knocking Intel off its perch are premature at best. "It's a good, solid plan, but it's about when they should have been two years ago," said Mike Feibus, an analyst at Mercury Research in Scottsdale, Ariz.

Several key elements of the PowerPC plan — notably the operating system and the Common Hardware Reference Platform (CHRP) — have been lacking (see chart). Those elements seem to be taking shape just as the chip technology appears to be ready to take another leap forward, Feibus said.

To help it compete, the PowerPC triad will build chips to run in servers, desktops and mobile servers — as do Intel's wares — but will increase clock speeds in its chips more rapidly than Intel.

The PowerPC vendors said that later this year they will ship 300-MHz systems. Intel's top clock speed will remain at 200 MHz, officials there said. By the end of next year, clock speeds will rev up to 400 MHz with a new series of PowerPC chips, code-named G3. By 2000, the PowerPC group plans a family of chips — code-named G4 — that will cut a swath at 600 MHz.

PowerPC systems manufacturers, including Apple, Power Computing Corp., and Umax Computer Corp., are already working on desktop systems based on a 300-MHz PowerPC chip.

Intel faster, too

Intel in Santa Clara, Calif., is hardly sitting still. The company plans to introduce new versions of the Pentium Pro with its multimedia extension (MMX) instruction set early next year in 200-MHz and 233-MHz versions, according to sources briefed by Intel. By the middle of next year, Intel expects to ship a 266-MHz Pentium Pro, followed later in the year by a 300-MHz version, the sources said.

Although the proposed PowerPC speeds are impressive and could give information systems managers a new processing tool, some said they are hesitant to plunge into the untested waters.

"We're not likely to use the PowerPC for much but on our Mac systems at the moment," said Erik Goldoff, an IS manager at the Center for Disease Control and Prevention in Atlanta. "It may be a great chip, but applications are going to go to Intel systems first. It's that simple."

The Mac OS and IBM's AIX run on the hardware. Microsoft Corp.'s Windows NT Server also runs on the PowerPC, but applications must be recompiled.

With its high volume, Intel also has a price advantage. A 200-MHz Pentium Pro MMX will cost about $525, sources said. The 200-MHz PowerPC chip will cost $520, meaning that systems using the Intel chips probably will cost less than PowerPC systems, analysts said.

Missing apps stall multiprocessing

By Lisa Picarille

Apple Computer, Inc. and Macintosh clone makers are starting to rally around multiprocessing systems. But corporate users said they won't be tempted to buy until software becomes available.

Users said they are waiting for Copland — Apple's next-generation operating system that has symmetrical multiprocessing support — and third-party applications written for the PowerPC-based multiprocessors. Copland is due next summer.

But that isn't stopping Apple, Umax Computer Corp., and Power Computing Corp. Those vendors will announce Macintosh multiprocessing computers at Macworld Expo this week in Boston (see related story at left).

Although the System design

"We've boxy probably won't win fans among general business users, they "will have major appeal for people doing graphic design, design for the Web and high-end video," said Tom Rhinelander, an analyst at Forrester Research, Inc. in Cambridge, Mass.

Some users said they anticipate the ability to offload processor-intensive tasks, such as rendering images. But applications need to be rewritten to take advantage of the multiprocessing.

If there were a way to create movies "in millions of colors and still have the speed that I desire on my computer," I would be thrilled," said Russ Chapman, director of technical services at the Boston office of Jack Morton Productions, Inc. The New York-based production company creates promotional materials.

But, Chapman said, "Who cares right now because there aren't many [multiprocessing] applications. So right now, there isn't a cost/performance benefit to [multiprocessing]."

Apple officials said they are developing a program to encourage developers to do multiprocessing versions of their software.

In the meantime, Apple's new 9500/180MP offers users a 33% performance increase compared with the same model with a single processor, but only on specific tasks — the current Mac OS doesn't support full-fledged multiprocessing. So a 33% performance boost on a machine that runs at 180 MHz translates to about 239 MHz of processing power, but only for certain operations, such as crunching numbers.

Pieter Hartsook, editor of "The Hartsook Letter," an industry newsletter in Alameda, Calif., said users might be better off buying single-processor machines that run at 225 MHz all the time.

Internet features added to Mac E-mail

By Tim Ouellette

The message is good for Macintosh users who hope for better electronic-mail capabilities, especially over the Internet.

This week at Macworld Expo/Boston, vendors will outline plans to add Internet features to their Macintosh E-mail products. The Internet's open protocols help Macintosh users overcome many incompatibilities found in mixed Macintosh/PC environments.

CE Software, Inc., in West Des Moines, Iowa, will reveal its plans to Internet-enable QuickMail, the leading E-mail software package for the Macintosh. Competitor SoftArc, Inc. will preview Version 4.0 of FirstClass, its groupware/messaging software with native support for Internet E-mail protocols.

Also, Tenon Systems last week licensed Software.com, Inc.'s Post.Office Internet mail server for use in its Macintosh networking products, and Microsoft Corp. began to ship the Macintosh client for Exchange Server.

Faced with poor client software from PC vendors or limited support from Macintosh software vendors, Macintosh users hope to exploit the Internet as a way to simplify E-mail connectivity and get more features, analysts said.

For example, David Rasmusen, a Macintosh user at Internal- tional Paper Co. in Memphis, said he prefers to run Netscape Communications Corp.'s E-mail software to Lotus Development Corp.'s Notes client for the Macintosh, which other users have said is slow for E-mail.

Apple Computer, Inc. scrapped plans to offer its own E-mail and directory services in Copland, the next version of the Mac OS. Instead, the Cupertino, Calif., firm provides the free Apple Internet Mail Server (AIMS) for simple Internet mail connections.

Several users posting to Usenet discussion groups said they were preparing to migrate from QuickMail, which is still a proprietary system, over to AIMS for E-mail.

Pace picks up in Boston

By Lisa Picarille

AyStar Digital, Inc. has been carrying the Macintosh multiprocessing flag on its own for a year, but it is about to get a lot more company at this week's Macworld Expo/Boston.

Apple is expected to help legitimize the market by unveiling the PowerPC-based system that runs at 180 MHz. The 9500/180MP includes 32M bytes of RAM, a 2-Gbyte hard drive, an Eide speed CD-ROM drive and a video card for $5,699.

Rivals DayStar and Umax are expected to announce an agreement to collaborate on multiprocessing technology. Umax also will take the wraps off a 604E-based machine — the SuperMac 3800 — running at 180 MHz and 200 MHz.

The price of the systems ranges from $4,000 to $4,300. Each comes standard with 32M bytes of RAM, a 1-Gbyte hard drive, an 8-speed CD-ROM drive, six Peripheral Component Interconnect slots and five drives.

— Lisa Picarille
Feds garner failing grades for year 2000

By Gary H. Anthes

WASHINGTON

While some federal agencies will graduate with honors in the year 2000, most seem likely to flunk the course.

The "course" in this case is preparing systems to deal with the year 2000 problem. According to a formal survey released last week, 14 of 24 major agencies are wearing dunce caps, having earned "D"s and "F"s for their efforts so far to head off a digital Armageddon.

Rep. Stephen Horn (R-Calif.) compiled the report card from the results of a survey he initiated of federal agencies. "The information we have gathered will help Congress see that agencies meet their responsibilities to the American public," he said.

Although there isn't yet a congressional mandate to come to grips with the year 2000 problem, Horn's survey is the result of an April hearing on the subject.

"The hearing revealed that there is a serious lack of awareness of the problem on the part of people in business and government," Horn said last week.

Meanwhile, Congress is working on legislation to force agencies to develop by Nov. 1 plans and cost estimates for year 2000 fixes. And funding legislation for the Department of Defense will require the Pentagon to buy only year 2000-compliant software after Sept. 30, a congressional staffer said.

"A" students include the Social Security Administration, which began planning changes to its 30 million lines of software in 1989. It expects to complete the software upgrade by the end of next year.

The Small Business Administration also won top marks for its project, which it estimated would cost $4.8 million.

"F" students include the U.S. Department of Labor, which admitted it had no plan, no project manager and no cost estimate for its huge year 2000 conversion effort.

Even agencies with a project manager were relatively clueless about the size of the effort required over the next three years, when thousands of date-dependent routines must be located, rewritten or replaced and tested. The Defense Department estimates it will cost between $350 million and $3 billion to fix its 350 million lines of computer code, nearly a tenfold variance.

The Pentagon faces an especially tough problem because it has more systems written in more languages than any other agency. Many of its millions of lines of code are undocumented, and source code is no longer available for some applications. And date routines in hardware may be especially hard to fix if the hardware is obsolete.

Despite the huge cost, neither Congress nor the White House seems inclined to boost information systems budgets for the job. An administration official with oversight responsibility for the year 2000 effort said agencies are being encouraged to submit budget requests that earmark funds for year 2000 work, but those requests must be offset by decreases in other IS projects.

"No one is as far along as we'd like them to be," the White House official said.

Kathy Adams, associate commissioner for systems design and development at the Social Security Administration, said one way agencies hope to reduce costs is by banding together to share "best practices and lessons learned."

Adams, chairwoman of the Year 2000 Interagency Committee, said a best practices document will be posted next week on the Internet at www.itpolicy.gsa.gov.
Users cool to release of controversial laptop chip

By Mindy Blodgett

Intel Corp. this week released the 150-MHz Pentium processor geared specifically for notebooks, after months of controversy over the thermal and design issues posed by the faster, hotter chip.

Toshiba America Information Systems, Inc. and Digital Equipment Corp. each immediately unveiled a laptop featuring the chip. Other vendors, including IBM PC Co., Dell Computer Corp., Compaq Computer Corp. and NEC Technologies, Inc., said they plan to follow in the next few months. But users seem blase about the speedy chip.

"The [133-MHz Pentium processor] is fast enough for us," said Robert Womack, computer service director at Hale and Dorr, a Boston law firm. "I can't imagine rushing to buy 150 at this stage.

Industry observers said notebook vendors were leery of the 150-MHz chip because it yields less than a 10% performance boost over the 133-MHz chip. In addition, notebook vendors must design their 150-MHz laptops so that the chip doesn't burn up other components, such as PC cards, or drain batteries.

But vendors said they are convinced that users will want the 150-MHz notebooks.

"We have a lot of users who are always pushing the edge of the limits on the biggest and baddest," said James Bartlett, IBM's director of worldwide marketing. This week, Toshiba announced the 730CDT. It has a 150-MHz chip, a 2.02-G-byte hard drive, lithium ion batteries and a 12.1-in. active-matrix screen. The notebook, which costs $6,099, will be available in early September. And Digital announced the HiNote Ultra II. It has a 150-MHz chip, an 11.3-in. Super VGA screen and 16M bytes of memory. Priced at $5,099, it is shipping now.

Scarcity of notebooks

A more pressing issue, users and industry observers said, has been the notebook shortage.

"The problem is backlogs at the larger suppliers," said Asmar Madyun, mobile computing support manager for the Corporate Systems, Inc., which merged with AT&T Corp. in Warren, N.J. "For some of the leading notebooks, there is a three-month wait. I can't tell someone who is starting work tomorrow, ‘Sorry, you have to wait three months for a laptop.'" The shortage also affects price.

"I had one vendor [saleswoman] tell me she could get me some Compaq LITE 5280 notebooks," said Doug Moran, information systems analyst at CRSS Constructors, Inc. in Denver. "Then she called back to tell me . . . they were going to cost 12% more than the initial quoted price because of lack of supply."

Analysts blamed the shortages on notebook vendors being overwhelmed by the rapid succession of Intel chip announcements and surging demand for laptops.

But some vendors said the worst supply problems are over.

"We have been having the same problem," Bartlett said. "But we have been getting our volume up to levels to where we want it, and we have been getting [out] from behind the eight ball on supplies."

We review an IBM ultralight. See page 38.

Switch makers woo Internet applications

CONTINUED FROM PAGE 1

Jumping on the bandwagon this week will be Cabletron Systems, Inc., which is expected to unveil plans for a wide array of feature-rich remote/host equipment followed by its strategy for rolling out Internet provider and carrier switches (see chart above).

Already on board the Internet provider train are IBM, which recently allied with Cascade Communications Corp., and Cisco Systems, Inc., which merged with StrataCom Inc.

Com Corp. and Ascend Communications Corp., meanwhile, have announced remote access/switch systems.

Constant challenge

Although internetworking vendors have the high-capacity routing and switching products needed to fix the plumbing of the Internet, they face many challenges. Those include forging links with cash-strapped Internet providers and dealing with the perennial router vs. switch debates.

Bob Moscowitz, a technical support specialist at Chrysler Corp. in Highland Park, Mich., attributed the problem to the fast-growing number of users who run more bandwidth-demanding applications — such as interactive voice, data and video — on the Internet. Internet provider networks and infrastructures haven't kept pace, he added.

Other users agreed.

"On the application side, users love the neat graphics of Web sites. But from a network perspective, there would be much less strain on nets if the fabulous graphics and images were smaller and pages were more text-based," said James Wiedel, director of networking at the University of Southern California in Los Angeles.

"The networks can't handle the traffic volumes," Analysts said 'net providers need to bulk up their networks as soon as possible but added that is far easier said than done.

"ISPs and carriers need more industrial-strength platforms, but it's less of a technology issue and more of a [business] challenge," said Eric Hindin, a senior program manager at The Yankee Group in Boston. Some vendors, such as Cabletron, don't yet have agreements with any Internet providers and carriers to buy their switching equipment, while others have some agreements, but just for routers, he added.

"We are in a time of serious troubles," Moscowitz said. "We have one class of ISPs that don't have the money to fix congestion situations by adding bigger buffers, more memory, trunk cards and high-speed lines to their routers."

"Adding routers and faster lines between them would help do load balancing and eliminate some problems. But the expense of that would kill many ISPs," Wiedel agreed.

But for the Internet providers with money to spend, analysts said the big decision is whether to continue using routing or move to switching (see chart, page 1).

"ISPs in particular, and some carriers, will need to up-grade their overburdened router networks into more reliable and powerful networks based on switching," said John Morency, a principal at The Registry, Inc., a consulting and research firm in Newton, Mass. "ISPs have had and are having severe capacity problems that have translated into big headaches for users."

Same old song: Entry-level PC prices dip

By Bob Francis

The cost of a basic entry-level corporate PC is dropping again — this time by about $500 — although it may be the last time this year.

Last week, Hewlett-Packard Co. and AST Research, Inc. joined IBM PC Co. and Dell Computer Corp. in lowering the costs of their entry-level corporate PCs.

Price wars

Spurred by lower prices on new models from Compaq and NEC, vendors have been busy cutting PC prices

<table>
<thead>
<tr>
<th>Vendor/Product</th>
<th>Processor</th>
<th>Hard drive</th>
<th>Old Price</th>
<th>New Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dell Computer</td>
<td>OptiPlex GXpro</td>
<td>8/80-MHz Pentium Pro</td>
<td>$2,149</td>
<td>$2,698</td>
</tr>
<tr>
<td>AST Research LLC</td>
<td>166-MHz Pentium</td>
<td>L26 bytes</td>
<td>$927</td>
<td>$783</td>
</tr>
</tbody>
</table>

The latest price war was kicked off by market leader Compaq Computer Corp. with its introduction of new Deskpro systems at about $500 less than a comparable PC just eight months ago.

In January, a Compaq ProLinea E desktop powered by a 100-MHz Pentium, with 8M bytes of RAM and a 1-Gbyte hard drive, cost about $1,600. After Compaq's recent introduction of the Deskpro line to replace that model, a similarly configured system starts at about $1,100.

In the fallout from Compaq's introduction, HP's Vectra line now starts at about $1,170, and AST's Bravo line begins at $1,300.

"The prices are looking pretty good," said Erik Goldof, information systems manager at the Centers for Disease Control and Prevention in Atlanta. "The system prices had to come down because component prices have obviously been dropping."

Indeed, the price of components — system memory in particular — has continued to decrease. PC vendors have cut system prices four times since the beginning of the year.

"If we decide to use Windows NT for some applications, we're going to be paying for Pentium Pro systems because it wouldn't make sense to use 16-bit Pentium desktops there," said Simon Tau, a network administrator at New York University.

We review an IBM ultralight. See page 38.
Trying to find accurate information in the midst of all the intranet hype is a challenge. Relax. You'll feel a lot better when you get the facts from the industry experts. Call for your free Forrester Reports on intranets and Web server software. Both analysts and the trade press agree, if you're building an intranet, you need to consult Netscape.

Forrester defines Full Service Intranet as: standardized e-mail, directory, file print, and network management. Netscape gets it. And with SuiteSpot it has begun to deliver on the vision.

-The Forrester Report
The Full Service Intranet, March, 1996

And PC WEEK said:
For corporations planning to use internet-based technologies for internal use, [Netscape] SuiteSpot is shaping up as a better alternative...

-PC WEEK, May 13, 1996

Netscape's full range of intranet solutions provides greater functionality and costs less to implement than proprietary intranet solutions like Lotus Notes and Microsoft BackOffice. In fact, when Forrester polled professionally managed Web sites, 80% indicated they had chosen Netscape.

So call, or visit our Intranet Solutions site at home.netscape.com to find out for yourself. And breathe a sigh of relief.
Talk about considerate. Beyond having a thermal sensor that tells you if it's too hot, the new Compaq Deskpro will warn you if its hard drive's about to fail anywhere. It's all part of what we call the next generation of Intelligent Manageability. Among other things, it
give IS managers a broader range of integrated solutions. And to minimize installation and your configuration time, we provide an upgradeable integrated NIC and network-ready software which protects your investment and allows for growth. Ultimately what you get with Intelligent Manageability is lowered cost of ownership. Add to that a three-year warranty, plus dedicated toll-free technical support that's open for business seven days a week, 24 hours a day. Control. It's what makes the new Compaq Deskpro so hot. In a cool kind of way. For more information, visit us at www.compaq.com or call 1-800-392-8883.

Has It Changed Your Life Yet?
Carriers are trying new ways to lure skeptical IBM SNA network users — a huge, untapped market — into the frame-relay fold. According to analysts, most customers could save roughly 20% to 40% by changing from private-line networks to public network-based frame-relay services.

Currently, just 20% of about 50,000 SNA shops use frame relay within the corporate network, said Tom L. Nolle, president of CIMI Corp., a consultancy in Voorhees, N.J. He predicted the bulk of frame-relay revenue won't come from SNA customers until 1998.

SNA, or Systems Network Architecture, is a 22-year-old IBM network architecture still used for most mission-critical legacy applications. Users typically run SNA traffic over low-speed, expensive point-to-point and multidrop private lines.

Frame relay is a packet-switching technology that transmits variable size frames of data. The technology is best suited for bursty traffic.

Converting from leased line to frame relay lets users consolidate multiple branch applications on one network. Carriers use frame-relay access devices (FRAD) to convert LAN and other data protocols to frame relay.

"The central office FRAD is the key thing — a significant contribution the carrier has made," to frame-relay networking, Nolle said.

Recent alliances targeted to support SNA migrations include MCI Communications Corp. in Washington and Synch Research, Inc. in Irvine, Calif. Also, Phoenix-based Hypercom Network Systems has teamed with Lucent Technologies, Inc. in Murray Hills, N.J.

Northern Telecom has paired up with Motorola, Inc.'s Information Systems Group in a three-year agreement to offer Motorola's Vanguard FRADs in frame-relay installations.

Price and performance are what drew Walgreen Co. in Deerfield, Ill., to frame-relay service.

"It's cheaper than leased line," said Ray Sheedy, director of corporate telecommunications at Walgreen, which is slowly migrating about 800 of its 2,250 stores to frame relay. "It's priced right."

Despite the obvious attraction of price, another analyst cautioned against expecting a stampede to frame relay.

"I don't think we'll see the remaining 80% of SNA (users) jump over to frame relay over the next two years," said Beth Gage, broadband analyst at Telechoice, Inc. in Verona, N.J.

Perhaps 20% to 30% of the remaining SNA market will migrate to frame relay, but many network managers will stick with their usual SNA private lines, she said.

Melanie Hanssen, senior manager of frame-relay marketing at MCI, said many customers are concerned about how SNA will function in a frame-relay environment. But by installing FRADs, users are finding that critical traffic can be prioritized and managed end-to-end, she said.
From now on, if you can imagine it, you can manage it.

Informix Introduces The First Truly Universal Server.

Imagine this.
An infinitely scalable, multi-function relational database, that can be further enhanced by anyone, to do anything, with any kind of information. In other words, the INFORMIX-Universal Server.

Informix's unique DataBlade™ technology gives you the ability to manage any type of data, from text and numbers to sound, video, web pages — even time-series and geo-spatial data. And whatever else you need to unleash the power of business innovation.

Call 1-800-688-IFMX, ext. 81, to get a copy of the Aberdeen Group's white paper. Or visit us on the web at www.informix.com, for examples of DataBlade technology in action.

Once you've seen Informix's Universal Server, it'll be hard to imagine managing without it.
FREE for a Limited Time...A CD ROM Preview of

The Top New Data Warehousing Software

As the only end-to-end solution for rapid data warehousing, SAS software delivers everything you need to manage, organize, and exploit your business data. The tools you use to build a data warehouse are the same ones used to maintain it...run it...and change it.

And what's more, everything's scalable. You can jump right into enterprise-wide information delivery applications...or start small and build on your success.

SAS software doesn't consume overhead for database features you don't need. And once you have data in the warehouse, you'll find everything you need for data query and reporting, OLAP/multi-dimensional analysis, data mining, database marketing, data visualization, and much more. It's never been easier to access your data...or to arrive at informed decisions by turning raw data into real information.

When 200,000 IS managers were asked to choose the top software for data warehousing, their answer had a familiar ring:

SAS software from SAS Institute.

Software for Successful Decision Making

Phone 919.677.8200 Fax 919.677.4444
In Canada 1.800.363.8397

You can also request your free CD ROM, and learn more about SAS seminars in your area, by visiting us on the World Wide Web at http://www.sas.com/

E-mail: cw@sas.sas.com

SAS is a registered trademark of SAS Institute Inc. Copyright © 1996 by SAS Institute Inc.
Everything you're looking for in PCs.

From a place you probably didn't look.

You might not think of Unisys as a place to find state-of-the-art PCs for your company. But all that's changed with Aquanta™ PCs and servers. This new product line matches—and even surpasses—the best the PC world has to offer.

Aquanta means quality, with rigorous testing that ensures mainframe-class dependability for mission-critical applications.

Aquanta means performance, with one of the industry's most powerful and scalable product lines—including multiprocessor Pentium and Pentium Pro models, SMP servers and fault-resilient servers.

Aquanta means compatibility, with support for all major operating systems and networks to simplify client/server computing.

Aquanta means support, through Unisys worldwide experience implementing technology across departments, companies and countries.

And finally, Aquanta means this: While we may not be the first place you look for PCs, we just might be the last.

http://www.unisys.com/adv or 1-800-874-8647, ext. 244

© 1996 Unisys Corporation. Aquanta is a trademark of Unisys Corporation. The Intel Inside Logo, Pentium and Pentium Pro are registered trademarks of Intel Corporation.

UNISYS

The Information Management Company
Vendors schedule calendar standard

By Tim Ouellette

Calendaring and scheduling software vendors envision a day when different products will exchange appointment information over the Internet.

But don't mark it on your calendar yet. Twenty firms, including Lotus Development Corp., Microsoft Corp., On Technology Corp., FTP Software, Inc., Novell, Inc. and Netscape Communications Corp., met recently in Mountain View, Calif., to develop a standard for submission to the Internet Engineering Task Force, the Internet's standards body.

To do that, they must set up a workgroup and hash out the various proposals on the table (see chart). Responses are expected by next March. A standard and actual products could follow soon after.

But the group also will have to overcome a history of standards-effort failures and focus on providing an open standard, not a vendor-dictated one.

"As long as it [any standard] is open, even if I have to go through a small gateway, I am all for it," said Stephen Lopez, director of systems and technologies at the National Board of Medical Examiners in Philadelphia. He said the use of Novell's GroupWise is widespread internally, but appointments with outside doctors are still made by telephone. "Right now, we go bonkers trying to coordinate schedules with external committee members," Lopez said. But not all user sites are united on one product. Many companies have a potpourri of scheduling software or areas with none at all, and they are more concerned about getting better enterprise products than maintaining several different software packages.

A white paper delivered at last week's meeting noted that when a worker is bogged down scheduling an appointment via telephone or fax, it reverberates through the organization. Hence another standards effort.

"The thing none of these efforts had before is the ubiquitous connection the Internet provides," said Jay Batson, president of On Technology in Cambridge, Mass. The Internet allows World Wide Web browser access and reduces communication problems, he said.

Anyone Can Put Terabytes In A Box.

The Trick Is Getting Them Out.

Today, your mainframe and open systems users demand more than massive storage capacity. They demand massive access — non-stop, fail-safe and lightning-fast. No small trick. Fortunately, Amdahl makes storage systems to satisfy the most demanding mindsets.

Your open systems users won't mind having unprecedented data access. That's what our new 16/3 4000 channel/rate storage family delivers. Performance that scales up with capacity — to a stunning 20,000 I/Os per second at a full terabyte.

Our Spectris "storage family puts System/390 users' minds at ease with non-stop data delivery. Through batch and on-line processing, even maintenance. 24 x 7, all the time."

Satisfying demanding users is no trick at all. Just go with Amdahl.

(800) 223-2215, http://www.amdahl.com

PITTSBURGH
CAREERS
WILL BE FEATURED IN
COMPUTERWORLD'S
AUGUST 19 EDITION
DEADLINE: AUG 15, 3PM
1-800-343-6474 x8201
The SDK For This Inc
Object-Oriented Database

There's A Seminar Near You.

<table>
<thead>
<tr>
<th>Location</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albany, NY</td>
<td>Nov 18</td>
</tr>
<tr>
<td>Albuquerque, NM</td>
<td>Oct 28</td>
</tr>
<tr>
<td>Atlanta, GA</td>
<td>Oct 16</td>
</tr>
<tr>
<td>Birmingham, AL</td>
<td>Oct 11</td>
</tr>
<tr>
<td>Calgary, Ab., Can.</td>
<td>Dec 3</td>
</tr>
<tr>
<td>Charlotte, NC</td>
<td>Oct 21</td>
</tr>
<tr>
<td>Chicago, IL</td>
<td>Sep 11</td>
</tr>
<tr>
<td>Cleveland, OH</td>
<td>Dec 10</td>
</tr>
<tr>
<td>Columbia, SC</td>
<td>Oct 18</td>
</tr>
<tr>
<td>Dallas/Ft. Worth, TX</td>
<td>Oct 18</td>
</tr>
<tr>
<td>Denver, CO</td>
<td>Sep 12</td>
</tr>
<tr>
<td>Des Moines, IA</td>
<td>Sep 27</td>
</tr>
<tr>
<td>Detroit, MI</td>
<td>Dec 5</td>
</tr>
<tr>
<td>Edmonton, Ab., Can.</td>
<td>Dec 5</td>
</tr>
<tr>
<td>Houston, TX</td>
<td>Oct 21</td>
</tr>
<tr>
<td>Irvine, CA</td>
<td>Nov 6</td>
</tr>
<tr>
<td>Jackson, MS</td>
<td>Oct 15</td>
</tr>
<tr>
<td>Jacksonville, FL</td>
<td>Sep 30</td>
</tr>
<tr>
<td>Jersey City, NJ</td>
<td>Nov 13</td>
</tr>
<tr>
<td>Kansas City, MO</td>
<td>Oct 1</td>
</tr>
<tr>
<td>Knoxville, TN</td>
<td>Oct 11</td>
</tr>
<tr>
<td>Lexington, KY</td>
<td>Oct 9</td>
</tr>
<tr>
<td>Little Rock, AR</td>
<td>Sep 23</td>
</tr>
<tr>
<td>Los Angeles, CA</td>
<td>Nov 8</td>
</tr>
<tr>
<td>Louisville, KY</td>
<td>Oct 7</td>
</tr>
<tr>
<td>Memphis, TN</td>
<td>Sep 25</td>
</tr>
<tr>
<td>Miami, FL</td>
<td>Oct 4</td>
</tr>
<tr>
<td>Milwaukee, WI</td>
<td>Sep 13</td>
</tr>
<tr>
<td>Minneapolis/St. Paul, MN</td>
<td>Sep 16</td>
</tr>
<tr>
<td>Montgomery, AL</td>
<td>Oct 9</td>
</tr>
<tr>
<td>Nashville, TN</td>
<td>Sep 27</td>
</tr>
<tr>
<td>Norfolk, VA</td>
<td>Oct 29</td>
</tr>
<tr>
<td>Oklahoma City, OK</td>
<td>Sep 18</td>
</tr>
<tr>
<td>Omaha, NE</td>
<td>Sep 25</td>
</tr>
<tr>
<td>Parsippany, NJ</td>
<td>Nov 15</td>
</tr>
<tr>
<td>Philadelphia, PA</td>
<td>Nov 11</td>
</tr>
<tr>
<td>Phoenix, AZ</td>
<td>Nov 1</td>
</tr>
<tr>
<td>Pittsburgh, PA</td>
<td>Dec 12</td>
</tr>
<tr>
<td>Raleigh/Durham, NC</td>
<td>Oct 25</td>
</tr>
<tr>
<td>Richmond, VA</td>
<td>Oct 31</td>
</tr>
<tr>
<td>Rochester, NY</td>
<td>Nov 21</td>
</tr>
<tr>
<td>Sacramento, CA</td>
<td>Nov 13</td>
</tr>
<tr>
<td>San Antonio, TX</td>
<td>Oct 25</td>
</tr>
<tr>
<td>San Diego, CA</td>
<td>Nov 4</td>
</tr>
<tr>
<td>San Francisco, CA</td>
<td>Nov 15</td>
</tr>
<tr>
<td>San Jose, CA</td>
<td>Nov 18</td>
</tr>
<tr>
<td>St. Louis, MO</td>
<td>Oct 3</td>
</tr>
<tr>
<td>Tampa, FL</td>
<td>Oct 2</td>
</tr>
<tr>
<td>Tucson, AZ</td>
<td>Oct 30</td>
</tr>
<tr>
<td>Tulsa, OK</td>
<td>Sep 20</td>
</tr>
<tr>
<td>Washington, DC</td>
<td>Nov 8</td>
</tr>
<tr>
<td>Wichita, KS</td>
<td>Sep 16</td>
</tr>
<tr>
<td>Winnipeg, Man., Can.</td>
<td>Sep 20</td>
</tr>
<tr>
<td>Winston-Salem, NC</td>
<td>Oct 23</td>
</tr>
</tbody>
</table>
Jasmine™ has everything you need to develop the killer app of tomorrow.

It's a true multi-platform, object-oriented database that supports all multimedia datatypes, including video, audio and animation. Make your apps sizzle as you leave behind all of the limitations of relational and hybrid databases and all the frustrations of today's limited, multimedia development tools.

Jasmine has a fully integrated, development environment for visual, object-oriented, drag-and-drop media authoring. It has rich multimedia classes of preexisting objects and browsers for viewing classes, objects, queries, methods and specs. And it comes with a Method Editor for viewing method characteristics, and has "wizard-style" assistant aids for writing efficient queries. Your application can even be deployed as a Web browser plug-in. Write it once and run it anywhere: Internet, Intranet and client/server.

Call and apply today. It's your free ticket to the brave new world of object-oriented, multimedia development and the quickest way to achieve your true potential.

Call 1-888-7JASMINE to apply for a FREE Jasmine Training Seminar and a FREE Jasmine SDK.

Or visit us at www.cai.com

©1996 Computer Associates International, Inc., Islandia, NY 11780-7000. All other product names referenced herein are trademarks of their respective companies.
Revamp flies off course

Huge FAA modernization effort falls under fire; critics question usefulness of downsized project

By Gary H. Anthes

It has been a bumpy ride the entire way for the FAA’s air traffic control modernization program. Conceived in the mid-1980s, the hugely ambitious effort has been plagued by mismanagement, cost overruns, missed deadlines, software that doesn’t work, unhappy users and other horrors.

The project was intended to be a top-to-bottom overhaul of the computers, software, radar units and communications networks used by controllers. The goal was to lower operating costs, improve system reliability, enhance safety and improve flight operation efficiency.

After several midcourse corrections, the $7 billion Advanced Automation System (AAS) program was greatly downsized and restructured two years ago. This essentially means the FAA will enter the 21st century having solved its equipment reliability problems, but most of the other modernization goals won’t be met.

For example, a $1 billion project to combine the two systems used to control aircraft near airports and en route to airports was grounded. The department also canceled a $850 million system to replace hardware and software at the facilities that control aircraft within 20 to 30 miles of airports.

In addition, the plan to replace equipment in towers at 150 airports was reduced to only the 70 largest airports. And many features in the surviving systems were deferred.

“The [system] will have the potential to be upgraded, but initially it will just give us the same old thing,” said Mike Connor, director of safety and technology for the National Air Traffic Controllers Association.

“When the AAS was first promised, it had all these new features, but now it is basically just a replacement of the radar screen for air traffic controllers,” said an analyst for a congressional aviation oversight committee.

For example, one feature that was deleted would have included voice-activated commands and hand-held devices, allowing controllers to move away from their keyboards to avoid visual obstructions.

Observers said the AAS replacement program is off the ground, and the FAA said the now significantly downsized project will arrive at the gate ahead of schedule.

“It is now back on track and will deliver important safety improvements that will carry aviation into the next century,” Transportation Secretary Federico Pena told a congressional oversight committee last month.

“We have learned from our past mistakes,” said Dennis Kocher, program director for airways facilities requirements at the FAA.

“Our program is on track, on schedule and sound.”

Efforts to stay on schedule were made a year ago when the FAA decided not to wait for new client/server software to be written and to move old code off the ancient IBM mainframes that deliver radar and flight-plan data to controllers.

That code is being moved to five new interim mainframes, the first of which will go online in Chicago in December. This is 10 months earlier than officials anticipated a year ago.

Meanwhile, work continues on the Display System Replacement (DSR) project, the centerpiece of the modernization program.

DSR eventually will move controllers to a client/server architecture. It replaces computers, radar displays, controller workstations and networks, along with those five mainframes, at the nation’s 20 Air Route Traffic Control Centers, which handle traffic among airports.

The first DSR hardware will be installed in Seattle by year’s end and will be in operation by mid-1998, the FAA said. The last is due to be installed in June 2000.

Ancient systems tax FAA

CONTINUED FROM PAGE 1

approaching the ragged edge,” said a spokesman for the Aircraft Owners and Pilots Association in Frederick, Md. “They definitely need to continue with modernization.”

Investigation shows problems

That “ragged edge” is spotlighted in a special investigative report issued earlier this year by the National Transportation Safety Board (NTSB), which detailed the following concerns:

- The backup control system lacks several safety features found in the primary system, such as automated warnings that aircraft are flying too low or too close together.
- Because of frequent hardware failures, the 25-year-old mainframes that present radar and flight-plan data to controllers often operate without full redundancy.
- The system in the New York region operated in a state of “compromised redundancy” more than 56% of the time during one 18-month period.
- Operating in the backup mode can greatly increase the workloads of already-stressed controllers by requiring more manual processing and “rebuilding” of flight information from memory.
- Many controllers aren’t proficient in using the backup system because they receive limited training.

“Controllers are under enormous pressure, and anything that goes slightly wrong makes their job inordinately harder,” said Peter Neumann, a specialist in computer reliability and safety at SRI International in Menlo Park, Calif. “I think we’ve been pretty lucky in the past.”

Nevertheless, the NTSB concluded, “The public should not be unduly alarmed by recent press accounts of... equipment failures. In the vast majority of computer outages, controllers were able to provide safe aircraft [distances] using

Milestones in air traffic control modernization

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1983</td>
<td>Planning for Advanced Automation System (AAS), the heart of the FAA’s air traffic control modernization, begins. Estimated cost: $2.5 billion Estimated completion: 1994</td>
</tr>
<tr>
<td>1985</td>
<td>An air traffic control modernization milestone is reached.</td>
</tr>
<tr>
<td>1987</td>
<td>FAA awards AAS contract to IBM. Revised cost: $4.8 billion.</td>
</tr>
<tr>
<td>1990</td>
<td>IBM confirms 10-month slippage in AAS project.</td>
</tr>
<tr>
<td>1991</td>
<td>The FAA’s air traffic control system handles 300 million flights annually.</td>
</tr>
<tr>
<td>1993</td>
<td>The FAA’s air traffic control system handles 220 million flights annually.</td>
</tr>
</tbody>
</table>

Source: Federal Aviation Administration, Washington

The FAA’s air traffic control system handles 220 million flights annually.

- 246,000 are delayed because of weather
- 4,000 are delayed because of equipment failures
- Air traffic control systems are 99.43% reliable.
Air Force system shows the way

Off-the-shelf components save millions

It is apparently possible to develop a safe, effective air traffic control system for less than $1 billion. The FAA and the U.S. Air Force developed just such a system for Edwards Air Force Base in Rosamond, Calif. Unlike most FAA efforts of this type, this one extensively used commercial off-the-shelf hardware and software. Total investment: about $15 million and five years.

Although the FAA is trying to accomplish a similar task on a much broader scale, the Air Force project is noteworthy because of its shrink-wrapped approach. According to the National Transportation Safety Board (NTSB), the air traffic control system, which went online two years ago and is called High Desert Tracon, uses redundant primary computer systems. When a Sun Microsystems, Inc. SPARC 4/470 fails, an identical machine running the same software kicks in instantly and transparently. Conversely, the standard in commercial aviation today relies on a primary system backed up by a different, and less capable, standby system.

Use of off-the-shelf technology and standard Unix will let the Air Force easily upgrade to Sun SPARC 1000 servers without writing a single line of code, the NTSB said. "The ingenuity associated with the development of the High Desert Tracon system deserves consideration as a model for future air traffic development and procurement programs," the NTSB said in an investigative report issued earlier this year.

— Gary H. Anthes

backup system."

Air traffic today is protected by a hierarchy of redundant systems, people and procedures, according to David Tuttle, program director for operations at the FAA. If several layers of systems all go out, controllers can still work safely using manual and pilot-assisted procedures, he said.

Tuttle noted that the ultimate safeguard remains the option of leaving planes on the ground or in holding patterns. "The intent is to maintain safety, even if we have to take an economic impact; we just throttle the traffic back," he said.

Mike Connor, director of safety and technology at the National Air Traffic Controllers Association in Washington, was less sanguine. He said backup systems don't always offer complete protection. "They don't give you all the safety features; they just give you a basic radar picture and, in some cases, the third level of [backup] is just keeping track of where everything is in your head," he said.

"These failures have become a safety issue," said Connor, whose organization is the labor union for 15,000 U.S. controllers. "The equipment is just flat wearing out."

Indeed, 1980s-era computers are so fragile that components can literally crumble when handled. Replacement parts for IBM 9020E mainframes, which IBM no longer supports, must sometimes be scavenged from an FAA training facility in Oklahoma. And as the computers have aged, many qualified technicians have retired, further eroding maintenance quality.

Fighting problem plague

The FAA's bid to modernize air traffic control systems began in the mid-1980s for the Air Line Pilots Association International in Washington. One reason is that many planes have a system that shows radar images of nearby aircraft and issues an alert if any get too close.

"But some big airplanes, such as cargo and charter carriers, don't have it," the spokesman said. "Those pilots are more concerned about flying in crowded skies."

Who's flying where when the lights go out?

Air traffic controllers are more worried about communication outages than they are about computer breakdowns. But the biggest fear of all is for power outages, when all computer and radar systems go dark. A one-second outage in Chicago in September 1994 caused 477 flight delays. And a year ago, at a control facility near Oakland, Calif., the primary and both backup power systems failed. During the hour that radar was lost, two planes came dangerously close, but a collision was avoided by pilots who could see each other.

According to another anecdote supplied by an investigative report issued by the NTSB, a pilot near Washington radiated a Mayday call to a controller when he lost an engine, but the controller's station couldn't receive the radio frequency set aside for emergencies.

The pilot was able to restart his engine at 8,000 feet and continue his flight — without ever talking to the controller.

In the New York area, controllers have learned to avoid issuing clearances to planes passing through known radio "dead spots" caused by obstructions. "When you have no communications, you kind of have airplanes wandering around out there, and they are not controlled anymore," said Mike Connor, director of safety and technology for the National Air Traffic Controllers Association.

— Gary H. Anthes

Off-the-shelf hardware and software. Total investment: about $15 million and five years.

Although the FAA is trying to accomplish a similar task on a much broader scale, the Air Force project is noteworthy because of its shrink-wrapped approach. According to the National Transportation Safety Board (NTSB), the air traffic control system, which went online two years ago and is called High Desert Tracon, uses redundant primary computer systems. When a Sun Microsystems, Inc. SPARC 4/470 fails, an identical machine running the same software kicks in instantly and transparently. Conversely, the standard in commercial aviation today relies on a primary system backed up by a different, and less capable, standby system.

Use of off-the-shelf technology and standard Unix will let the Air Force easily upgrade to Sun SPARC 1000 servers without writing a single line of code, the NTSB said. "The ingenuity associated with the development of the High Desert Tracon system deserves consideration as a model for future air traffic development and procurement programs," the NTSB said in an investigative report issued earlier this year.

— Gary H. Anthes

backup system."

Air traffic today is protected by a hierarchy of redundant systems, people and procedures, according to David Tuttle, program director for operations at the FAA. If several layers of systems all go out, controllers can still work safely using manual and pilot-assisted procedures, he said.

Tuttle noted that the ultimate safeguard remains the option of leaving planes on the ground or in holding patterns. "The intent is to maintain safety, even if we have to take an economic impact; we just throttle the traffic back," he said.

Mike Connor, director of safety and technology at the National Air Traffic Controllers Association in Washington, was less sanguine. He said backup systems don't always offer complete protection. "They don't give you all the safety features; they just give you a basic radar picture and, in some cases, the third level of [backup] is just keeping track of where everything is in your head," he said.

"These failures have become a safety issue," said Connor, whose organization is the labor union for 15,000 U.S. controllers. "The equipment is just flat wearing out."

Indeed, 1980s-era computers are so fragile that components can literally crumble when handled. Replacement parts for IBM 9020E mainframes, which IBM no longer supports, must sometimes be scavenged from an FAA training facility in Oklahoma. And as the computers have aged, many qualified technicians have retired, further eroding maintenance quality.

Fighting problem plague

The FAA's bid to modernize air traffic control systems began in the mid-1980s for the Air Line Pilots Association International in Washington. One reason is that many planes have a system that shows radar images of nearby aircraft and issues an alert if any get too close.

"But some big airplanes, such as cargo and charter carriers, don't have it," the spokesman said. "Those pilots are more concerned about flying in crowded skies."

Who's flying where when the lights go out?

Air traffic controllers are more worried about communication outages than they are about computer breakdowns. But the biggest fear of all is for power outages, when all computer and radar systems go dark. A one-second outage in Chicago in September 1994 caused 477 flight delays. And a year ago, at a control facility near Oakland, Calif., the primary and both backup power systems failed. During the hour that radar was lost, two planes came dangerously close, but a collision was avoided by pilots who could see each other.

According to another anecdote supplied by an investigative report issued by the NTSB, a pilot near Washington radiated a Mayday call to a controller when he lost an engine, but the controller's station couldn't receive the radio frequency set aside for emergencies.

The pilot was able to restart his engine at 8,000 feet and continue his flight — without ever talking to the controller.

In the New York area, controllers have learned to avoid issuing clearances to planes passing through known radio "dead spots" caused by obstructions. "When you have no communications, you kind of have airplanes wandering around out there, and they are not controlled anymore," said Mike Connor, director of safety and technology for the National Air Traffic Controllers Association.

— Gary H. Anthes
THEY SAY NO ONE IS INDISPENSABLE.
THIS IS WHAT TO HAVE IN CASE YOU ACTUALLY ARE.

There are some people in every organization without whom everything comes to an unseemly halt. While this is very flattering, it’s not very efficient. And so, to make your unavoidable absences from the office entirely beside the point, we invented Mobilized Computing™ technology. As implemented in the new Hitachi Notebooks, it has the potent effect of projecting your authority to multiple places at once. And the practical advantage of coming entirely pre-configured. Immediately ready to connect via 28.8 modem to the Net, online services, two-way fax, or local area networks through that rarest of electronic luxuries, a built-in LAN port. Perhaps your company could muddle through without your constant guidance. Mobilized Computing ensures they’ll never have to find out.

REMOTE CONTROL™

Series C Notebook is available with 11.6" active matrix screen, Pentium® 120 MHz chip. Series M Notebook is available with 11.6" active matrix screen and Pentium® 133 MHz chip. Both built to standards exemplified by a five-year warranty.

©1996 Hitachi PC Corporation (USA). All rights reserved. Mobilized Computing™ and Remote Control™ are trademarks of Hitachi PC Corporation (USA). All other trademarks are property of their respective companies.
Paradigm drift

Hyperbole: extravagant exaggeration; see also computer industry

The most refreshing escape I know from the incessant din of computer industry hyperbole is a visit to an independent user group. Last week I had the opportunity to spend some time at the New Orleans meeting of Share, one of the three big IBM user organizations.

Share is a pretty technical bunch of folks. The members run bet-your-business applications—the kind where two hours of downtime a year is considered a record to improve upon. But they’re not just big iron bigots. Sessions on Notes, the Internet and Unix were packed.

Share members live in the grimy real world where the technology rubber meets the implementation road. And the dominant emotion I sensed at this year’s meeting was frustration with the overhyped benefits of new technology.

When I asked five Share members which trade shows they visit these days, four said they have forsaken trade shows entirely because of the hype. The fifth said he goes to shows mainly to steel himself against the inflated expectations of his users who are also in attendance. When asked what Computerworld could do to meet his needs better, another user responded wearily, “Just help me cut through all the hype.” Another Share member summed up his attitude toward the industry this way: “They promise, but work.”

I just read your “10 reasons computer experts must be male” (“Inside Lines,” CW, June 3) from Women in Higher Education, July 1996, and found it hilarious and factual. A little humor in this job goes a long way. Thanks for making my day a little brighter.

Mary Betten
President
Ridgewater College
Willmar, Minn.

Honesty best policy

While most of the suggestions in Michael Cohn’s “Helpful hints for scrubbing cyberspace” [CW, July 1] column were very humorous, I believe one makes perfect sense. Simply have everyone be honest about who they are while on the Internet. If you are into chat rooms, what is wrong with using your name? Currently, it sure seems to me that the Internet is very much like the Ku Klux Klan, where no one wants to show his or her face. If you believe you have a right to participate in porn, why not admit it by using your name? 

A perfect match?

If I can believe your article (“Swap-pable drives due,” CW, July 1), Western Digital Corp. has produced the first truly disposable disk drive. Given just over a 10-day mean time before failure, one should expect to purchase these little gems by the carton. Install these devices at your company, and you will have little need to educate your users on the importance of daily (hourly?) backups. In just one month, your users will have more firsthand experience than many users get in a lifetime.

I suggest augmenting each Nordic drive with an Iomega Corp. Zip? The Nordic would address the “damn near DOA issue” presented by the Nordic. A marriage made in heaven?

The real Next story

Next Software has conceded victory to Microsoft, and the trade press still can’t digest a Next press release correctly. Take note of your July 8 time line (“Next’s road to OpenStep”), which incorrectly claimed that Next abandoned NextStep in January. Here’s what really happened: Next Software merely renamed NextStep to “OpenStep for Mach.” Some half-wit industry analyst mistook the new name for an abandonment of Next-Step, and the trade rags have been getting this wrong ever since.

Politics play part in quality software

I agree with David Wright’s article (“Getting back quality soft-ware,” CW, July 8). His commentary also applies to government and corporate information systems, where in-house and outsourced development efforts all too often fail. However, Wright’s assertions as to what is needed are too simplistic. Deciding to “pay the price” is a moot point when hundreds of millions of dollars are wasted on efforts that produce zero usable code. Hiring the “best programmers” is certainly no guarantee of success, but it’s the best place to start, especially with so many projects populated with wannabe software experts. The real root of the problem is that the political imperative always wins. Those in charge — the non tecnical — are truly not responsible for bearing the consequences of failure.

Paul Gillin, editor
Internet: paul_gillin@cw.com
www.ultranet.com/~pgillin


Letters to the editor

Paul Gillin, editor
Internet: paul_gillin@cw.com
www.ultranet.com/~pgillin


COMPUTERWORLD AUGUST 5, 1996 (www.computerworld.com)
Yes, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of $39.95* per year - a savings of over 73% off the single copy price.

<table>
<thead>
<tr>
<th>First Name</th>
<th>M</th>
<th>Last Name</th>
</tr>
</thead>
</table>

Please complete the questions below.

1. BUSINESS/INDUSTRY (Circle one)  
   10. Manufacturing  
   20. Financial/Insurance/Real Estate  
   30. Media/Public Relations  
   40. Government  
   50. Communications Systems/Public Utilities/Telecommunications  
   60. Aerospace/Defense  
   70. Manufacturing of Computer/Computer-Related Systems or Products  
   80. Professional Services  
   90. Computer/Peripheral Dealers/Distributors/Resellers  
   100. Other (Please specify)  

2. TITLE/FUNCTION (Circle one)  
   10. Chief Information Officer/MC  
   20. President, Exec VP, SVP/VP  
   30. Director, Senior Manager  
   40. Manager, Staff  
   50. Analyst  
   60. Systems Integrators/VARs/Consulting Mgt.  
   70. Other (Please specify)  

3. Do you use, evaluate, specify, recommend, purchase: (Circle all that apply)  
   (a) IBM  
   (b) Apple  
   (c) Sun Microsystems  
   (d) Microsoft  
   (e) Novell  
   (f) Cray  
   (g) Digital Equipment Corporation  
   (h) Other (Please specify)  

4. How many people are employed at this location in your entire organization, including all of its branches, divisions and subsidiaries? (Specify only one per column.)  
   A. 0-249  
   B. 250-499  
   C. 500-999  
   D. 1,000-1,999  
   E. 2,000-4,999  
   F. 5,000-9,999  
   G. 10,000-19,999  
   H. 20,000+  

1. At this location  
2. Entire organization  

Please complete the questions below.

1. BUSINESS/INDUSTRY (Circle one)  
   10. Manufacturing  
   20. Financial/Insurance/Real Estate  
   30. Media/Public Relations  
   40. Government  
   50. Communications Systems/Public Utilities/Telecommunications  
   60. Aerospace/Defense  
   70. Manufacturing of Computer/Computer-Related Systems or Products  
   80. Professional Services  
   90. Computer/Peripheral Dealers/Distributors/Resellers  
   100. Other (Please specify)  

2. TITLE/FUNCTION (Circle one)  
   10. Chief Information Officer/MC  
   20. President, Exec VP, SVP/VP  
   30. Director, Senior Manager  
   40. Manager, Staff  
   50. Analyst  
   60. Systems Integrators/VARs/Consulting Mgt.  
   70. Other (Please specify)  

3. Do you use, evaluate, specify, recommend, purchase: (Circle all that apply)  
   (a) IBM  
   (b) Apple  
   (c) Sun Microsystems  
   (d) Microsoft  
   (e) Novell  
   (f) Cray  
   (g) Digital Equipment Corporation  
   (h) Other (Please specify)  

4. How many people are employed at this location in your entire organization, including all of its branches, divisions and subsidiaries? (Specify only one per column.)  
   A. 0-249  
   B. 250-499  
   C. 500-999  
   D. 1,000-1,999  
   E. 2,000-4,999  
   F. 5,000-9,999  
   G. 10,000-19,999  
   H. 20,000+  

1. At this location  
2. Entire organization  

Please complete the questions below.

1. BUSINESS/INDUSTRY (Circle one)  
   10. Manufacturing  
   20. Financial/Insurance/Real Estate  
   30. Media/Public Relations  
   40. Government  
   50. Communications Systems/Public Utilities/Telecommunications  
   60. Aerospace/Defense  
   70. Manufacturing of Computer/Computer-Related Systems or Products  
   80. Professional Services  
   90. Computer/Peripheral Dealers/Distributors/Resellers  
   100. Other (Please specify)  

2. TITLE/FUNCTION (Circle one)  
   10. Chief Information Officer/MC  
   20. President, Exec VP, SVP/VP  
   30. Director, Senior Manager  
   40. Manager, Staff  
   50. Analyst  
   60. Systems Integrators/VARs/Consulting Mgt.  
   70. Other (Please specify)  

3. Do you use, evaluate, specify, recommend, purchase: (Circle all that apply)  
   (a) IBM  
   (b) Apple  
   (c) Sun Microsystems  
   (d) Microsoft  
   (e) Novell  
   (f) Cray  
   (g) Digital Equipment Corporation  
   (h) Other (Please specify)  

4. How many people are employed at this location in your entire organization, including all of its branches, divisions and subsidiaries? (Specify only one per column.)  
   A. 0-249  
   B. 250-499  
   C. 500-999  
   D. 1,000-1,999  
   E. 2,000-4,999  
   F. 5,000-9,999  
   G. 10,000-19,999  
   H. 20,000+  

1. At this location  
2. Entire organization  

The Developer of Information Systems Management

The Newspaper of Information Systems Management

Save over 73%
The smart money is on dumb old storage

keep hearing information systems managers and developers say, “We’re keeping an eye on Java, but we don’t think it’s ready for prime time.”

My answer is always the same: “Java is ready for prime time. What are you waiting for?”

Just ask Elmer Baldwin. Baldwin is president of Via World Network, a unit of Andersen Consulting. Via is an Internet-based travel network designed for the business market. It handles online travel planning, booking, transactions, ticketless travel, settlement, reconciliation and the capture of travel usage data for corporate customers.

And Via was written entirely in Sun Microsystems’ Java.

Via comprises a front-end application and a back-end engine for rules processing and transaction processing. There are more than 200,000 lines of code in the application alone.

“It’s the most bulletproof language we’ve used.”

The system “will be open for prime-time business” in the first quarter next year. Baldwin says the system his group developed using Java is robust and will handle heavy transaction loads.

Granted, Baldwin’s group did an exquisite job of architecting the application and designing a “system to build the system.” The initiative began about nine months ago. Baldwin engaged the most seasoned client/server architects from Andersen, including the team that developed the firm’s Universal Construction Tool for client/server applications. This team, in turn, designed the architecture and training. They trained 120 programmers to be Java programmers, half of them in the Philippines. They embedded strict object-enforcement techniques into the training and taught the programmers to use, without question, the “software black boxes” developed by the architects.

The result is a very impressive distributed system, designed and deployed in record time.

Baldwin says the only problem the group had with Sun was the availability and performance of Sun’s compiler and development tools. “There are four Java compilers on the market today, and three of them run on Windows NT. We had selected Sun Solaris as our initial platform. In the crunch, Sun flew a team to Minneapolis to address the issue.

“We also had some integration problems with the Oracle database Oracle Client Interface layer, but we’ve worked them out,” Baldwin says.

What about the lack of higher-level tools and a complete environment for Java development? “Our programmers were C and C++ programmers. They were immediately comfortable with Java.” Baldwin says. “And we developed our own paperless development environment using Lotus Notes to handle project management, check-in, check-out and version control.”

“In the history of programming languages, there’s never been a larger quality assurance effort with any language than there is with Java,” Baldwin says. “There are thousands of designers and developers all over the world beating on Java.”

Granted, Baldwin’s team at Via World Network did a lot of things right. But the fact remains that they’ve built an entire multiairline reservations and reconciliation system using Java.

If that’s not ready for prime time, I don’t know what is.

Seybold is president of Patricia Seybold Group in Boston. Her Internet address is pseybold@psigroup.com.
You see a horse race. We see two thoroughbreds.
A lot of other companies do, too. They're running both the Windows' 95 and the Windows NT® Workstation operating systems.

Why? Because they want to realize the benefits of a more reliable, more manageable operating system. They also want to run the latest versions of their applications' and take advantage of exciting new Internet technologies. That's why seven out of ten organizations* have deployed (or are planning to deploy) Windows 95 and/or Windows NT Workstation: They know that both are safe bets.

The reason we developed both operating systems is twofold: First, to achieve maximum compatibility with our customers' existing hardware and software, and second, to provide them with an even more reliable and secure operating system. Today, customers can run most of the same applications across both Windows 95 and Windows NT Workstation. And soon, with the release of Windows NT Workstation 4.0, both products will share the same user interface.

What's the right mix for your organization? That depends on what you need. Windows 95 is the easiest way to migrate to 32-bit Windows. It not only supports a third more hardware devices than Windows NT Workstation, it also has lower system requirements. Windows 95 also offers greater compatibility with certain MS-DOS® applications. What's more, it has two functions that Windows NT Workstation, for the time being, does not: Plug-and-Play, and Power Management for mobile users.

Windows NT Workstation, on the other hand, offers greater reliability and security, thanks to its advanced microkernel architecture. It's simply one of the most powerful and robust 32-bit desktop operating systems you can get.

So if you thought you needed to hedge your bets, you don't, because this is no horse race. In fact, we will continue to support and update each product in the future since our customers continue to want both the broad compatibility of Windows 95 and the power of Windows NT Workstation.

For more help determining the best mix for your company, visit www.microsoft.com/windows/mix2/
Let's be honest. Having our NetServers showered with accolades is a kick. Besides, it shows how serious we are about building quality network systems. For detailed specs, visit http://www.hp.com/go/netserver. Or call 1-800-533-1333, Ext. 1689.
PDAs meet PIMs

By Mindy Blodgett

Some road warriors want the latest devices with all the trimmings—the fastest, lightest "smart phone." But a good personal digital assistant (PDA) that links to his scheduling software is all Bruce Simon is looking for.

"I don't want to drag around a laptop," said Simon, president of Omaha Steaks International, Inc. in Omaha. "But I need to keep up with my scheduling and appointments."

Vendors are working to add improved connectivity to PDAs and personal information managers (PIM). For instance, Valuegraph™ 4471 with built-in speakers or the new Nokia 447X or 447Xi professional caliber displays, near the front of the pack is Puma Technology, Inc. in San Jose, Calif., which recently shipped IntelliSync software for U.S. Robotics Corp.'s Pilot organizer.

IntelliSync was designed to link contact management and scheduling applications that run on desktops or notebooks with Pilot software. The software supports several PIM and group scheduling packages, including Lotus Development Corp.'s Organizer 2.1, Microsoft Corp.'s Schedule+ for Windows 95 and Starfish Software, Inc.'s Sidekick for Windows and Windows 95. Puma uses infrared technology for the data exchange.

Simon, a longtime Pilot user, said the software definitely is a step in the right direction.

"I just push a button, and it takes about 15 seconds to syn-chronize about 450 addresses," said Simon, who has been testing the new software.

Market boost

Tiera Ray, an analyst at Technologic Partners, Inc., a consultancy in New York, said the Puma announcement is the kind of development needed to advance the PDA market.

"Users need better connections to their desktops," Ray said. "Until developments like IntelliSync, PDAs were stand-alone devices. You need to be able to exchange data."

Joe Custer, director of Eastern U.S. and European sales for Chromatic Research, Inc. in Sunnyvale, Calif., is another beta tester of the product.

"I use Lotus Organizer, and before this software, it was really a challenge to keep things updated between the Pilot and my desktop," he said.

IntelliSync for Pilot costs $69.95. Pilot, which was released in March, costs $299 and weighs in at 5.7 ounces.

PC hard drives keep growing and growing...

By Jaikumar Vijayan

Western Digital's enterprise drives

- Capacity: 2G bytes and 4G bytes
- Form factor: 3½-in.
- SCSI support: Ultra Fast/Wide
- Transfer rate: 10M, 20M and 40M byte/sec.
- Availability: September

Last week, for instance, Western Digital Corp. introduced two drives that feature formatted capacities of 2.1G bytes and 4.3G bytes. The new Western Digital drives — which are the first high-performance drives from its newly created enterprise storage unit — are being aimed at higher-end desktop audio and video applications and PC servers.

The 3½-in.-wide, 1-in-high Enterprise drives come with a number of performance-enhancing features, including 100 percent faster transfer rates and 100 percent faster data seek times.
IBM’s ThinkPad 560: Quick, light and no frills

By James Connolly

The IBM ThinkPad 560 is just one entry in a class of new notebook computers that may make you reevaluate your computing needs. It isn’t for everyone.

On first impression, you might say, “Holy cow, they packed a lot of computer into a small package.” It is only 1/8-in. thick, and it is light at 4.1 pounds. But it is quick — our test machine was based on an Intel Corp. 120-MHz Pentium processor — with a 12.1-in. thin-film transistor color screen and a full-size keyboard. Like most ThinkPads, the 560 has a few neat design tricks: The casing and battery are molded into a ripple shape, which makes it easier to carry; and an external dial makes it easy to control the volume on the decent-sounding speakers.

The 560, starting at $2,699 and available for the past month, can serve as a fine lightweight portable for people who want to do basic computing.

But you might wonder what “basic computing” actually is anymore. One way to save notebook weight is to exclude the floppy and CD-ROM drives — as IBM did with the 560. You can connect such drives with cables, but packing them into a computer case nullifies the weight advantage. And two extra drives plus cables add up to four more items you can forget to pack or that you can lose at the worst possible times.

Two other trade-offs are the 810M-byte hard disk — relatively small in the Windows 95 era — and the fact that the 560 doesn’t work with IBM’s new standardized docking stations.

Connolly is Computerworld’s technology evaluations editor.

PC hard drives

CONTINUED FROM PAGE 37
enhancing and high-availability features. These include support for Fast/Wide SCSI interfaces, up to 40M-byte/sec. transfer rates and fast data access times.

Prices will be announced when the drives ship next month.

Other vendors with similar disk drives include Seagate Technology, Inc. and its Barracuda drives, IBM and its Ultrastar 2 and Quantum Corp. and its Viking drives.

The availability of such high-performance drives boosts storage capacity on servers and significantly increases maximum internal data transfer rates for users.

“If I have a 4G-byte hard drive, it is going to be possible for me to transfer the contents of several CD-ROMs into it and access the data much faster that way,” said Peter Prellwitz, a microcomputer support specialist at W. B. Saunders Co. in Philadelphia.
When the competition heats up in the semiconductor business, you accurately match your manufacturing mix, customer demand and profitability or it's time to "cash in the chips." That's why Philips Semiconductors, one of the nation's largest silicon chip manufacturers, decided it needed a faster, more efficient system for key managers to analyze the information stored in the corporation's 40 operational databases. What was the solution? A Data Warehouse built with the help of EDA middleware, FOCUS Six reporting and analysis tools, and an experienced team of application experts...all from Information Builders.

Today, worldwide sales data from three continents is transmitted via TCP/IP network to Philips' data center in Sunnyvale, California. It's then loaded to a mainframe Data Warehouse using EDA middleware technology for data access and migration. Managers and business analysts in Marketing, Sales and Finance access and analyze the warehouse data with FOCUS Six for Windows EIS Edition, and use FOCUS Six Reporter to create ad hoc reports. The result...business managers keep manufacturing in sync with market demand through better forecasting; while IS managers spend their time developing other strategic systems instead of generating 300 pounds of custom reports each month.

Philips Semiconductors is just one of thousands of examples of how Information Builders has partnered with the world's leading corporations to build enterprise-level reporting and analysis systems. Find out how Information Builders' technology and services can help your organization. Call us at 800-969-INFO.
HP’s Vectras fill corporate bill

By Howard Millman

Hewlett-Packard Co.’s new Vectra VA and XA model PCs were designed to appeal to corporate customers by promising reduced cost of ownership and increased performance. HP is breaking the model used with its other product lines by offering a powerful Spartan box and letting users configure it for their needs. Street prices start at less than $3,000 and rise to $5,000 for a fully loaded network-ready Vectra XA with a monitor.

Our VA 6/200 test machine contained a 200-MHz Intel Corp. Pentium Pro CPU, 32M bytes of extended data output dynamic RAM and an eight-speed internal CD-ROM drive. The unit’s standard 1.25-gigabyte hard drive is adequate if you deploy the Vectra as a fat client on a network. For a stand-alone environment, you should consider HP’s optional 2.5-gigabyte drive.

Ready to run

Transferring the Vectra from the box to the desktop took just minutes with the help of illustrated instructions and a CD-ROM that contained configuration information. During the initial boot sequence, the system’s BIOS offered fast access to the setup screens.

Our VA 6/200, clearly designed for business use, lacked amenities such as a modem, network card and bundled applications. The only software included was Microsoft Corp.’s Windows NT 3.51 Workstation; even that is optional on the lowest-end VA models.

Although the lack of hardware and software amenities was disappointing, the design of the Vectra made it easy to add our own expansion cards. The case opened without tools, and all internal components were readily accessible, including the two Peripheral Component Interconnect (PCI) and Industry Standard Architecture (ISA) slots, plus one PCI/ISA vertically stacked slot. Despite the unit’s streamlined desktop design, the four-slot configuration leaves room for an additional disk drive or a tape backup.

HP’s integrated Cirrus Logic, Inc. 64-bit video controller competently handled a wide range of graphics-intensive applications, including one-fourth screen video. Mounted on the motherboard and wired directly into the PCI bus, the controller provided resolutions of up to 1,600 by 1,200 by 16 million colors.

Externally, the Vectra offers the usual array of ports, including two nine-pin serial ports. We would rather see one nine-pin and one 25-pin serial port because many external modems still use 25-pin serial connectors.

To assess the Vectra’s performance under varied conditions, we installed Windows 95 — using V Communications, Inc.’s Navigator 2.0, and didn’t notice any appreciable decrease in performance. Furthermore, the hard-drive access rate was minimal, even when opening and closing large .AVI files along with the productivity applications.

The Vectra scored high marks for operator comfort. Its low-profile, tactile feedback keyboard provided exceptionally smooth action. We especially liked "Soft Power Down," a feature that assures an orderly shutdown to minimize corrupted files and lost data that often result from switching off without first saving all open files and flushing caches.

Overall, the HP Vectra VA Pentium Pro is a solid performer. Although it lacks built-in software and offers a modest amount of default add-ons, it delivers more than adequate speed and usability.

Our test unit lacked "LAN Remote Power-On," a feature available only on HP’s higher-end XA. Based on our April 29 review of IBM’s PC 750 machines, which offered a similar feature called "Wake On LAN," we suggest corporate purchasers allow that intelligent amenity to help reduce their own labor.

Millman is a writer and network consultant in Croton, N.Y.
I want a manageable Managed Query Environment.

☐ Please send me information on MANAGED REPORTING PAK.
☐ Please send me information on FOCUS Six Reporting Systems.
☐ Please have a sales rep call ASAP.

We will be evaluating reporting & analysis tools in:

☐ 1-3 months  ☐ 3-6 months  ☐ 6-12 months

Budget has been allocated:

☐ Yes  ☐ No

NAME:
TITLE/DEPT.:
COMPANY:
ADDRESS:
CITY  STATE  ZIP
TELEPHONE:

Information Builders
CALL 800-969-INFO
In Canada call 416-364-2760
HOW DO YOU BUILD A MANAGED QUERY ENVIRONMENT THAT STAYS MANAGEABLE?

CALL THE BUILDERS.

ALL THINGS MUST CHANGE

Today's latest tools for creating Managed Query Environments (MQE) make life very manageable... for the users. But what about the MQE Administrator? You know, the guy or group who has to define your business views and build your queries so all you do is point, click, and drag. What happens if some or all of your 200 business analysts need new or different views of your data? What happens if accounting methods change, or quotas are calculated differently? How does the MQE administrator keep your Managed Query Environment from becoming an unmanageable nightmare? The answer... FOCUS Six Managed Reporter.

INTRODUCING THE MANAGEABLE MQE

FOCUS Six Managed Reporter is the only MQE toolset that shields the MQE Administrator as well as the end user from the complexities of SQL. FOCUS was invented for reporting. Even the most complex queries with conditional fields, rankings, "if-then-else logic," multi-dimensional analysis... the kinds of queries that could take even the most experienced programmers hours to build in SQL, take only a few seconds in FOCUS. And that means a managed query environment that's more responsive to change and much easier to maintain. And only FOCUS Six Managed Reporter offers a three-tier client/server architecture that dynamically partitions all queries. That means your network stays manageable too, because all aggregation takes place on your server. Only information is sent down to the PC... not millions of rows of data.

CALL THE BUILDERS

For more information of FOCUS Six Managed Reporter and our complete suite of three-tier client/server reporting systems, call "The Builders" at 800-969-INFO.

http://www.ibi.com 800-969-INFO
In Canada Call 416-364-2760

Ask about our MANAGED REPORTING PAK

FOCUS is a trademark of Information Builders, Inc., NY, NY 212-736-4433 E-mail: info@ibi.com WWW: http://www.ibi.com
INCREASE YOUR
PRODUCTIVITY
WITHOUT
CAFFEINE
OR OTHER
ARTIFICIAL
STIMULANTS
BY DR. LESLIE LARSON

OR

The NEC Versa 6000 Series:
133MHz Pentium Processor
PCI and CardBus Architecture
16MB RAM
1.44GB Hard Drive
12.1" 1024 x 768 TFT Display
Full-Screen MPEG Video
Swappable 6X CD-ROM
28.8 Data/Fax/Voice Modem
Lithium Ion Battery

Visit our new web site at http://www.nec.com
Easy access to ODBC
Firms to ship identical database driver managers

By Dan Richman

Come this fall, developers will find it quicker and easier to write applications that access data through Microsoft Corp.'s Open Database Connectivity (ODBC) specification, according to two middleware vendors.

Intersolv, Inc. in Rockville, Md., and Visigonic Software, Inc. in San Mateo, Calif., have agreed to ship identical versions of software called an ODBC driver manager instead of the slightly but significantly different versions they ship today. The identical driver managers will implement Version 3.0 of ODBC, which is set to ship Nov. 1.

Standard path
The vendors' agreement is a step on the road to universal access of data that has been promised since Microsoft conceived ODBC in 1992.

But turning that promise into reality has been difficult. This is largely because competing companies have implemented ODBC drivers and driver managers - the two links between an application and data - differently. Using one vendor's driver manager with that vendor's driver may work, but substituting another vendor's driver might cause the application to fail.

"Even slight semantic differences among different vendors' products can make developers bang their heads against the wall in frustration," said David Cameron, an ODBC manager at Microsoft.

Intersolv and Visigonic will use source code from Microsoft to create identical driver managers for non-Windows platforms. Previously, only Visigonic used that source code under an exclusive agreement with Microsoft. Microsoft will remain the sole supplier of Windows-based driver managers.

Dan Sathoff, an information technology consultant at BP Exploration, Inc., an oil and gas exploration company in Anchorage, Alaska, said, "This could definitely help us reduce the complexity and increase the quality of the ODBC software we turn out."

About 80% of the non-Windows driver managers used today are from Intersolv or Visigonic, according to estimates from Intersolv. The remaining 20% are still potentially incompatible with other vendors' drivers, Cameron said. Drivers from vendors besides Intersolv and Visigonic may be incompatible.

A driver manager is bundled free with each $99 driver from Intersolv. Intersolv and Visigonic will use an exclusive agreement with Microsoft to create identical driver managers for non-Windows platforms. Previously, only Visigonic used that source code under an exclusive agreement with Microsoft. Microsoft will remain the sole supplier of Windows-based driver managers.

Need for suites starts to sour

By Lisa Picarille

Bucking conventional purchasing trends, some business users are opting for less expensive and less bulky integrated software packages.

Integrated software packages, which are primarily aimed at the consumer market, often come preloaded on new PCs and include rudimentary spreadsheet, word processing, drawing, charting, presentation and personal organization facilities.

Most corporate desktops have hefty feature-packed suites. This is because companies want more functionality and often standardize on more traditional software suites. Suites are a collection of applications, similar to what comes in integrated packages but with more robust functionality.

Differences between the two
Each application in a suite could be sold as a stand-alone piece of software. But the software in an integrated package can't stand on its own. Another difference is price. Most suites cost about $300, and integrated packages cost approximately $99 or come bundled free on some new PCs.

And the hefty memory requirement of suites need is too high, some users said. Microsoft Corp.'s Office, which has about 90% of the suites market, requires more than 40M bytes of memory. This is problematic because most users don't usually use all the packages in a suite, in essence wasting valuable desktop real estate.

For these and other reasons, part of Motorola, Inc.'s Phoenix-based operation recently replaced more than 1,000 copies of Office with Claris Corp.'s ClarisWorks integrated software package.

Rick Yborra, director of world marketing information solutions at Motorola, said, "These are high-end products from the likes of Landmark and BMC that we're starting to see in the NT environment," he said.

Both vendors' products essentially place performance management tools inside Windows NT, where the tools take different kinds of performance measurements that help administrators find and fix problems. These include load NT tools, page 45

NT performance tools ship

By Bob Francis

Systems management vendors continue to court Windows NT users with new tools.

Landmark Systems Corp. in Vienna, Va., recently began to ship performance management tools for Microsoft Corp.'s Windows NT Server and SQL Server. PerformanceWorks for Windows NT is available now, and prices start at about $10,000, Landmark officials said.

And the hefty memory requirement of suites need is too high, some users said. Microsoft Corp.'s Office, which has about 90% of the suites market, requires more than 40M bytes of memory. This is problematic because most users don't usually use all the packages in a suite, in essence wasting valuable desktop real estate.

For these and other reasons, part of Motorola, Inc.'s Phoenix-based operation recently replaced more than 1,000 copies of Office with Claris Corp.'s ClarisWorks integrated software package.

Rick Yborra, director of world marketing information solutions at Motorola, said, "These are high-end products from the likes of Landmark and BMC that we're starting to see in the NT environment," he said.

Both vendors' products essentially place performance management tools inside Windows NT, where the tools take different kinds of performance measurements that help administrators find and fix problems. These include load NT tools, page 45

NT tools, page 45

Nice to have, but...
Mapping software finds the 'net

New version of suite simplifies tasks for users

By April Jacobs

ESRI, Inc. plans to introduce a new version of its flagship desktop geographic information system (GIS) mapping suite by the fall and will unveil its Internet mapping server later this year.

The software from the Redlands, Calif., company may play well in a growing PC-based GIS market, according to Bruce Jenkins, vice president of Duratech, Inc., a market research firm in Cambridge, Mass.

Jenkins said Duratech estimates that PC-based GIS software grew more than 48% between 1994 and 1995, reaching revenue of $271 million.

But executives at Lotus say they have no plans right now to support OpenDoc.

OpenDoc is a standard architecture for plugging together software components to create distributed applications. Lotus' products, including Notes, are based on Microsoft Corp.'s OLE.

OpenDoc is a cross-platform technology, and OLE is Microsoft-specific.

Analysts and sources at IBM said the seeming impasse could have two major effects. Some said OpenDoc will suffer a critical blow if Lotus doesn't incorporate the technology into its products. They also said if Lotus snubs IBM's request, it could lead to the first open dispute between Lotus and its parent company since IBM bought the Cambridge, Mass., software company last year.

At least one user said he cares much more about getting an industry standard than he does about Lotus backing down.

"We use CC:Mail, and I suppose [OpenDoc] might be marginally useful," said Paul Singer, a technical specialist at Southern California Edison Co. in Rosemead, Calif.

"Actually, it would be nice to have a widely adopted standard instead of everybody just going off and doing their own thing," he said.

Needs momentum

IBM, which many analysts say is basing much of its future on the success of OpenDoc, released two OpenDoc-based component packages last week. IBM, Novell, Inc. and Apple Computer, Inc. first announced OpenDoc three years ago. Apple released its first OpenDoc component, Cyberdog, in May.

A highly placed IBM source said OpenDoc is finding support throughout most of IBM's divisions and offshore operations, except within Lotus. But the source, who asked not to be identified, said OpenDoc advocates plan to drag Lotus on board regardless.

Lotus executives have been clear about their opinion of OpenDoc. Jeffrey Papows, senior vice president at Lotus, said in a recent interview, "We don't support it, and we won't support it. It is important to IBM but not to us. OpenDoc is the sequel to the movie that never aired."

Scott Hebner, manager of IBM's marketing programs for application development and object technology, said the dispute has been blown out of proportion. "We're going to have to wait and see. We believe they will come around to support it," he said.

Others said getting Lotus' support is an integral part of IBM's plans to give OpenDoc the momentum it has been lacking for several months.

"We badly need Lotus Notes and SmartSuite ... for this technology to take off, and we are working with internal groups to make that happen," the IBM source said.

But some analysts said OpenDoc needs more than Lotus' support.

"If Lotus adopts OpenDoc, OpenDoc will still fail," said Ezra Gottheil, an analyst at Hurwitz Group, Inc. in Newton, Mass. IBM is asking Lotus "to make a fairly big architecture shift. Nobody is [adopting OpenDoc], and there's no reason they should."

By Sharon Gaudin and Tim Ouellette

IBM wants stepchild Lotus Development Corp. to adopt its OpenDoc technology, which would give the architecture a new lease on life.

IBM has given Lotus free reign since buying the company last year, but will the debate over object standards prompt IBM to tighten the reins?

IBM has been a major supporter of OpenDoc.

Lotus still supports OLE and ActiveX object frameworks.

As a major player through its Notes and Lotus' decision will affect thousands of business partners. It may also give a boost to OpenDoc and make it a viable alternative to OLE and ActiveX.

Lotus, said in a recent interview, "We don't support it, and we won't support it. It is important to IBM but not to us. OpenDoc is the sequel to the movie that never aired."

Scott Hebner, manager of IBM's marketing programs for application development and object technology, said the dispute has been blown out of proportion. "We're going to have to wait and see. We believe they will come around to support it," he said.

Others said getting Lotus' support is an integral part of IBM's plans to give OpenDoc the momentum it has been lacking for several months.

"We badly need Lotus Notes and SmartSuite ... for this technology to take off, and we are working with internal groups to make that happen," the IBM source said.

But some analysts said OpenDoc needs more than Lotus' support.

"If Lotus adopts OpenDoc, OpenDoc will still fail," said Ezra Gottheil, an analyst at Hurwitz Group, Inc. in Newton, Mass. IBM is asking Lotus "to make a fairly big architecture shift. Nobody is [adopting OpenDoc], and there's no reason they should."
Software

Microsoft Office to get face-lift, more features

By Lisa Picarille

The first thing users will notice when they get Microsoft Corp.'s forthcoming Office 97 on their desktops at the end of the year is a simpler interface that cuts across all applications.

Microsoft recently continued its trickle of information about new Office features when it revealed a more streamlined interface that replaces the cluttered menu and tool bar with a tool set called the Command Bars.

The new, customizable interface offers users a higher degree of consistency across applications and fewer memory requirements.

Microsoft also is updating the user help system with a feature called Office Assistant. Office Assistant's animated characters — there are nine to choose from — replace Office's Answer Wizard as the central location for online tips and advice about how to perform specific tasks.

Some users are skeptical about Office Assistant. They said it is just another attempt to foist a social interface on them, especially if it attempts to perform tasks for them. "Microsoft Office has a Bible interface. We're often looking for step-by-step instructions on how to do things," said Brian Moura, assistant city manager for the city of San Carlos, Calif., which has standardized on Office.

"Whether the assistant has a smiley face or a head attached to it really doesn't matter. The key is in the content. I'm not going to be dazzled by a dancing accountant in Excel if it doesn't help me do what I want to do," Moura said.

Picture perfect?

The forthcoming version of Office also will feature Office Art, a drawing program that lets users create sophisticated sketches, charts, logos and graphics using predefined shapes and effects.

Analysts said Microsoft's inclusion of a drawing program in Office is a direct response to rival Corel Corp.'s drawing package. "Microsoft takes Corel very seriously," said Chris Le Tocq, an analyst in San Jose, Calif. "Corel has brought the value model into the suites market."

Notes workflow beefed up with heavy database

Notrix PowerFlow improves on Notes' basic capabilities

By Tim Ouellette

Another third-party developer is trying to shore up the workflow capabilities of Notes. Percussion Software in Stoneham, Mass., which makes database integration software for Lotus Development Corp.'s Notes, is shipping Notrix PowerFlow.

PowerFlow is Notes-native software that lets developers include Notes applications in an automated business process without changing the application.

For example, users could make a Notes order-entry application part of a larger process to manage a product's life cycle — from manufacturing to shipping to servicing after the sale.

Improving on Notes

Notes is a strong collaboration platform, but analysts and users said its built-in workflow capabilities don't offer much beyond basic routing of forms for approval.

Workflow software lets users automate and track the progress of work items throughout an organization. Workflow adds stronger management, scalability and integration of different applications to basic electronic-mail-based routing.

"I cringe every time I hear people say they are using Notes [alone] for workflow," said Ian Campbell, an analyst at International Data Corp. in Framingham, Mass.

But Notes' development environment provides a good potential for workflow, so users depend on add-ons to get the job done, he said.

For example, Learning Tree International, Inc. in Los Angeles, a developer of training courses, wants to use Notes as a workflow server to manage the movement of course materials between editing and publication.

With Notes alone, users have to hard-code the workflow rules into the Notes application to get the same results.

This would require constant code updates when employees leave or change positions.

"We've been trying to work it out on our own," said Kim Morlaro, a project coordinator at Learning Tree. She is beta-testing Percussion's Notrix PowerFlow. "We've been doing what we can with Notes," she said.

Campbell said he likes the combination of workflow with Percussion's database background. Heavy-duty workflow processes require a strong database component so they can manage and track everything that is going on in the process.

How it works

Notrix PowerFlow's engine runs on the Notes server, and the workflow designer and management console run on the client. Routing plans, rules and employee roles and relationships are stored in a Notes database.

The workflow rules are separated from the Notes application, though, so users can change the structure of the workflow — including the people involved, who gets what documents and when — without having to change the application.

Most other workflow add-ons for Notes run external to the Notes system. Notrix PowerFlow costs $9,995 for the Designer, Engine and Management Console modules.

Need for suites starts to sour

CONTINUED FROM PAGE 43

ClarisWorks is "more approachable" for his users, which would allow them to "get more done and get up to speed quicker." Yborra said the smaller memory requirements of an integrated package fit better on portable machines, which are used by about half his 1,000 end users.

Mary Conti-Lorefred, an analyst at International Data Corp., a market research firm in Framingham, Mass., said the typical suite is huge and often isn't optimized to take advantage of today's hardware.

At least one industry watcher said this isn't a trend. "It's like saying not everyone needs a car. They can ride a bicycle," said Jeff Tarter, editor of "Softletter," an industry newsletter in Watertown, Mass. "But the overwhelming trend is away from simple packages; most corporations keep buying bigger, faster suites."

— Amy Wohl, editor, "TrendsLetter"

One Microsoft Office user said he views suites as an insurance policy.

"I may not need all the functionality of Office, but I like knowing that if I ever have to do something, the facilities to accomplish that task are already on my desktop," said Brian Peabody, director of end-user computing at Prime Construction Group, Inc. a construction equipment company in Norcross, Ga.

More change in software buying trends is inevitable because of the Internet, another industry watcher said.

"The ability to download components or pieces of software that offer specific functionality may herald the true beginning of small software, and servers that nearly everyone is now getting," said Amy Wohl, editor of "TrendsLetter," an industry newsletter in Narbarth, Pa. "I think that we are at the beginning of a next generation of simplified software."

NT tools

CONTINUED FROM PAGE 43

balancing and CPU utilization. The information also is used for reporting, modeling and capacity planning.

Having software that collects performance information from dispersed Windows NT servers eliminates the need for users to separately log on to each Windows NT server. It also lets administrators view performance on an application basis and not just on a server basis.

For example, Medaphis Corp. in Atlanta uses Landmark's PerformanceWorks tools for its distributed Unix systems to monitor applications that run in seven regional data centers. It can view applications that run across several of the company's servers in the regional data centers.

The NT version of the tool can do just about the same thing, Landmark officials said.

Hesitant users

But not everyone is ready to move to Windows NT as a distributed application server environment.

"We've got some Windows NT servers up and running, but I'd still like to see more systems management tools for that platform before we deploy them widely," said Erik Goldof, information systems manager at the Centers for Disease Control and Prevention in Atlanta.
The Best Choice In Standards-Based IntraNet Solutions Is Clear.

The NetManage® IntraNet Family lets workgroups work together better than ever. It includes everything necessary to build a powerful corporate IntraNet. And since it’s based on Internet standards, the IntraNet you build today can grow with you into the next century.

The Family includes all the necessary client and server applications to access information no matter where it’s located, collaborate with workgroups and share information, develop custom applications, and manage IntraNet performance.

**NEW** NetManage Chameleon™ IntraNet Desktop. With NFS!
- The most complete, best value in IntraNet desktop suites.
- Includes NFS for Microsoft Windows 95, NT, 3.1.
- Highly integrated—includes host access, e-mail and messaging, Internet access, group collaboration, file and print sharing, and desktop management.
- Access any server.

**NEW** NetManage ECCO PRO™ Workgroup
- The most award-winning Personal Information Manager for Windows is now available for workgroups.
- Low administration—no server required.
- Lets workgroups collaborate, schedule, plan, and synchronize in realtime.

**NEW** NetManage IntraNet HostLink™
- First standards-based collaboration server with a discussion forum server for Windows NT.
- Complete server suite—includes forums, DNS, Web, and NFS file and print.
- Highly scalable, easy to install and manage.

**NEW** NetManage IntraNet Server
- Everything you need in host connectivity to access UNIX, mainframe and midrange systems now comes in one box.
- Seamlessly deploy terminal emulation across your enterprise.

**NEW** NetManage ZMail™
- The only complete standards-based e-mail client & server solution on the market.
- Seamless Internet access.
- Runs on all Windows platforms.
- Easy to install and manage.

**NEW** NetManage SoftWare™
- The best value in PC X servers for Windows and Macintosh.
- Fastest PC X server you can buy.
- Includes complete suite of host and Internet connectivity solutions, remote and network capabilities.
- Microsoft-certified.

Visit our Web site to download software.
1-408-342-7525
IBM beefs up server line to do battle in operating systems market.

The Enterprise Network

Linking disparate systems makes enterprise E-mail systems . . .

A patchwork quilt

By Tim Ouellette

Patching together multiple electronic-mail systems has always been a painful task, but some users find they prefer a patchwork system to the homogeneity of standardizing on one product.

For example, the U.S. Department of Transportation monitors air, sea and ground traffic. But two years ago, the department couldn’t manage internal E-mail traffic among its own LANs. It was overloaded with messaging systems.

"For the first time, our top executives in telecommunications were getting more complaints about E-mail than [about] the telephone system," said George Ramick, messaging manager at the Transportation Department in Washington.

The department opted to let each agency keep its E-mail system — at least seven different ones — and connected them using a Mail Hub server from Control Data Systems, Inc. in Arden Hills, Minn. The servers translate different message formats and maintain an X.500-based directory.

Now Ramick expects up to 75,000 users in agencies that include the U.S. Coast Guard and the Federal Aviation Administration to route messages to one another through the Mail Hub server.

Options aplenty

Lost or unintelligible messages, lost connections, a confusing array of incompatible directories and empty file attachments are just some symptoms of the problem.

With the improvement in client/server E-mail packages from the traditional LAN-based messaging vendors such as Lotus Development Corp. and Microsoft Corp., some firms can take the scroched-earth approach and start over (see story at right).

But many organizations want to let their groups make up their own minds about their messaging systems — either because they prefer to leave the decisions in the hands of each division or because a complete transition would be too costly in software and training costs.

"We are very independent and decentralized, so we don’t have the desire to push a standard [E-mail system] for just a standard," McCleery said.

That approach can place the burden on information systems staff to make a host of different systems work.

"Management thought this was a simple fix, since it was just E-mail," Ramick said. "But I knew we were not in for a quick scenario."

Internet standards such as TCP/IP and Simple Message Transport Protocol are other options to avoid the proprietary nature of traditional E-mail systems.

Varian has taken that approach and installed Eudora Internet E-mail software for all new users. Groups that want to maintain their E-mail must install gateways to allow for smooth communications.

But analysts say the fast change of pace on the ‘net could paralyze users who need to make an E-mail decision.

"Because of changes in the market, especially with the Internet, some users are holding their plans back," said John Charalamous, manager of electronic messaging at Shell Services Co. in Houston.

Shell is moving away from its legacy and LAN-based mail systems and switching to Exchange on Windows NT servers.

But before cutting their ties with the past, companies must realize: they can’t implement a new system in one day.

While migrating users, IS staff still will have to deal with having different E-mail systems communicate with the new software.

— Tim Ouellette
It takes lots of money and manpower to keep information systems running.

Or so our competitors would have you think.
A database doesn't have to be cumbersome to be powerful. Case in point: Microsoft® SQL Server™ 6.5.

It's the one database platform that gives you the performance you demand with the economy and ease-of-use you didn't think possible. SQL Server 6.5 is easy to manage and offers low cost-of-ownership. The reasons why are many. SQL Server enables shorter application development cycles, requires less user support, and affords easier management than traditional databases. All while running on less expensive systems. And though you might expect to sacrifice performance for such low cost-of-ownership, remarkably the opposite is true. SQL Server actually meets or exceeds the raw power of the leading UNIX®-based databases. Factor in that it also easily extends to the Internet, and all your needs are covered.

SQL Server 6.5 is even easy to try. Download a 120-day evaluation copy from the Web at no charge and compare it to whatever system you're running. To download your trial copy, or to review a complete cost-to-use study, visit our Web site at www.microsoft.com/sql/.

To download a free* trial copy of Microsoft SQL Server 6.5, visit www.microsoft.com/sql/.

*Connect fees may apply. For more information call (800) 426-9400. © 1996 Microsoft Corporation. All rights reserved. Microsoft is a registered trademark and SQL Server and Where do you want to go today? are trademarks of Microsoft Corporation. All other trademarks and registered trademarks are the property of their respective owners.
Thoroughness and attention to detail are obsessions at BMW. So it's no surprise that they evaluated over 130 applications and all the major hardware providers when choosing information technology for their new manufacturing facility in South Carolina. The winners? Hewlett-Packard and SAP. Our team not only delivered a total, integrated client/server solution based on open systems — we got the system up and running in just four months, which is fully consistent with another BMW obsession: high performance.

For more information on how we can help put your company on the open road to success, call 1-800-275-7057 or cruise our homepage at http://www.hp.com/go/hp&sap
ATM just the prescription for hospitals

By Kim Girard

Asynchronous Transfer Mode (ATM) sales may be sluggish in most industries, but hospitals and medical care providers are proving to be a solid niche market, increasingly adopting the technology to meet bandwidth demands.

"Hospitals have one of the more valid applications for ATM," said Tom Jenkins, a broadband analyst at TeleChoice, Inc., a consultancy in Verona, N.J.

The increasing number of hospital mergers and the growth of managed health care have led to a bloom in demand for networks that can move large amounts of data among geographically dispersed sites, he said. ATM provides transmission at speeds of up to 155M bit/sec. that Integrated Services Digital Network and other technologies can't match, Jenkins said.

One of the latest ATM adopters is Indian River Memorial Hospital in Vero Beach, Fla., which is installing an ATM backbone connecting a switched Ethernet LAN that will support 1,000 PCs.

But ATM wasn't the easiest sell, acknowledges Indian River's MIS director David Hinkle. Management, which was committed to the old mainframe ways, needed convincing before CEO Michael O'Grady Jr. backed the $1 million project, he said.

I think we had a change in philosophical outlook," he said. "We got here, and it was largely a mainframe system. There were political issues of getting executive management's commitment to a new way of doing things."

Plenty of bandwidth

Once scarce and expensive, ATM products are becoming cheaper and more available through multiple vendors, Hinkle said. Also, ATM provides the bandwidth that physicians, technicians and employees at the hospital need to access and share images and patient records, he said.

We wanted to do things once and not have to revisit some of these issues down the road," Hinkle said.

"We looked at FDDI [Fiber Distributed Data Interface] and Fast Ethernet and decided ATM is where everything is going to go anyway," said Joe Sleeman, manager of network services.

So far, Indian River has connected 14 UB Networks, Inc. GeoLan 100 hubs to the ATM backbone. Eventually, nine buildings will be connected on the network, including the hospital, an outpatient surgical care center and a cancer center. Indian River uses ATM equipment from Santa Clara, Calif.-based UB, including the company's GeoSwitch.

Richard Broomell, Indian River's engineering data management coordinator, said the new network has made his job a lot easier. Now, he can access on his PC historical information stored on the AS/400 minicomputer, which is now connected directly to the network.

Users can also easily share blueprints, computer-aided design drawings, plans and work requests among different sites, he said.

Eventually, Indian River plans to bring ATM's capabilities to the desktop. Although ATM standards are emerging slowly, Hinkle said he is committed to the technology.

"It's tough to always wait for standards," Hinkle said. "You have to take your best guess, and when you can afford it, just go for it — apply the technology."

Indian River Memorial Hospital's Joe Sleeman: 'ATM is where everything is going to go'

"I think we had a change in philosophical outlook," he said. "We got here, and it was largely a mainframe system. There were political issues of getting executive management's commitment to a new way of doing things."

Plenty of bandwidth

Once scarce and expensive, ATM products are becoming cheaper and more available through multiple vendors, Hinkle said. Also, ATM provides the bandwidth that physicians, technicians and employees at the hospital need to access and share images and patient records, he said.

"We wanted to do things once and not have to revisit some of these issues down the road," Hinkle said.

"We looked at FDDI [Fiber Distributed Data Interface] and Fast Ethernet and decided ATM is where everything is going to go anyway," said Joe Sleeman, manager of network services.

So far, Indian River has connected 14 UB Networks, Inc. GeoLan 100 hubs to the ATM backbone. Eventually, nine buildings will be connected on the network, including the hospital, an outpatient surgical care center and a cancer center. Indian River uses ATM equipment from Santa Clara, Calif.-based UB, including the company's GeoSwitch.

Richard Broomell, Indian River's engineering data management coordinator, said the new network has made his job a lot easier. Now, he can access on his PC historical information stored on the AS/400 minicomputer, which is now connected directly to the network.

Users can also easily share blueprints, computer-aided design drawings, plans and work requests among different sites, he said.

Eventually, Indian River plans to bring ATM's capabilities to the desktop. Although ATM standards are emerging slowly, Hinkle said he is committed to the technology.

"It's tough to always wait for standards," Hinkle said. "You have to take your best guess, and when you can afford it, just go for it — apply the technology."

"I think we had a change in philosophical outlook," he said. "We got here, and it was largely a mainframe system. There were political issues of getting executive management's commitment to a new way of doing things."

Plenty of bandwidth

Once scarce and expensive, ATM products are becoming cheaper and more available through multiple vendors, Hinkle said. Also, ATM provides the bandwidth that physicians, technicians and employees at the hospital need to access and share images and patient records, he said.

"We wanted to do things once and not have to revisit some of these issues down the road," Hinkle said.

"We looked at FDDI [Fiber Distributed Data Interface] and Fast Ethernet and decided ATM is where everything is going to go anyway," said Joe Sleeman, manager of network services.

So far, Indian River has connected 14 UB Networks, Inc. GeoLan 100 hubs to the ATM backbone. Eventually, nine buildings will be connected on the network, including the hospital, an outpatient surgical care center and a cancer center. Indian River uses ATM equipment from Santa Clara, Calif.-based UB, including the company's GeoSwitch.

Richard Broomell, Indian River's engineering data management coordinator, said the new network has made his job a lot easier. Now, he can access on his PC historical information stored on the AS/400 minicomputer, which is now connected directly to the network.

Users can also easily share blueprints, computer-aided design drawings, plans and work requests among different sites, he said.

Eventually, Indian River plans to bring ATM's capabilities to the desktop. Although ATM standards are emerging slowly, Hinkle said he is committed to the technology.

"It's tough to always wait for standards," Hinkle said. "You have to take your best guess, and when you can afford it, just go for it — apply the technology."
Are you ready to enter the right circle for IT leadership?


SIM Interchange '96 is the conference for today and tomorrow's IT leaders. Experts in managing rapid technological change. Those seeking invaluable relationships with their peers in a enlightened, informed and unbiased environment.

SIM Interchange '96 is highly-focused, in-depth examinations of today's tough issues and solutions to even tougher problems, including:
- Organizational Change
- Intranet Realities
- Knowledge Management
- Sustainable Systems

More than 25 concurrent, interactive breakout sessions featuring the industry's most powerful voices.

Computerworld and SIM International will also present a special IT executive session on Knowledge Management. Moderated by Computerworld Senior Editor, Corporate Strategies, Joe Maglitta and Renaissance Solutions' Harry Lasker, this session looks at converting knowledge into revenue. Leaders from AT&T and CIGNA will tell you how they've put knowledge management systems in place, used technology assets to boost learning and performance — and improved the bottom line.

CIOs from Kraft, the Atlanta Committee for the Olympic Games, 3COM, Amoco and BankAmerica Corp. head the list of more than 40 featured speakers. Top drawer consultants from CSC and Omega Point will examine the best practices, people and solutions in leading companies. And you'll be able to share experiences, points of view and knowledge with other senior IT professionals from around the world.

IT's all taking place at the Society for Information Management's Interchange '96 Annual Conference.

September 29-October 2, 1996
Sheraton Palace
San Francisco, California

Register today by visiting the SIM Web site at www.simnet.org or call SIM Headquarters at 312.644.6610.

IT's an event you won't want to miss...so don't!
The Enterprise Network

Token Ring switch market struggles for growth

By Bob Wallace

If Token Ring switching is going to soar, switch vendors need to cut prices, offer high-speed up-links to backbone networks and make the technology more appealing to non-IBM shops, users and analysts said.

Although tried-and-Blue firms are staying loyal and migrating to Token Ring switching instead of switched Ethernet, industry experts have said the rest of the user community isn't taking a hard look at Token Ring switching.

Users said that is because they need more capacity now, and they like the much lower prices of switched Ethernet and the smooth migration path: switched Ethernet to Fast Ethernet to gigabit Ethernet. Token Ring switch users have to go to Asynchronous Transfer Mode (ATM).

Shipments of Token Ring switch ports have been steadily increasing (see chart), but some analysts say the technology faces an uphill climb.

"Sure, there's pent-up demand for it from the installed Token Ring customer base, but I don't see Token Ring switching being implemented much elsewhere," said Esmarelda Silva, a senior analyst at International Data Corp., a research and consulting firm in Framingham, Mass. "I don't see any 'new' customers."

Token Ring switching lets information systems managers boost performance by breaking large Token Ring LANs into subnetworks and/or consolidating many Token Ring LANs into one high-speed ring. That performance was enough to sell First Health Corp. on Token Ring switching.

"We had eight rings with about 130 nodes apiece, and performance was poor at best," recalled Randy Kitchens, a technical consultant at the Glen Ellen, Va., firm. First Health was among the first to implement Token Ring switching. "The increase in performance was so great that after the switch evaluation ended, and we went back to our old network, we had permission to buy the switch one day later," he said.

First Health used a switch from Centillion Networks, Inc., which was bought by Bay Networks, Inc.

"The switch has never given us a problem, and it took only a half-hour to install," Kitchens said. "And the Centillion 100 was the only Token Ring [system] that could support ATM between switches."

Looking for links

But there's more to Token Ring switches than ease of use and the performance boost.

Users are looking for vendors that offer a variety of high-speed up-links with the switch. Those links will let IS managers tie Token Ring switches to backbone networks.

"This is a top user requirement that can't be ignored," said Tam Dell'Oro, president of The Dell'Oro Group, a consulting and research firm in Menlo Park, Calif. Flavors of high-speed up-links include Fast Ethernet and Fiber Distributed Data Interface (FDDI) at 100M bit/sec, each, and ATM at 155M bit/sec. and up.

"Vendors frequently don't ship them for at least several months [after the product first ships]," Dell'Oro said.

Also high on users' requirements lists are pricing and the ability to expand the switch to support more ports.

"We look at the cost of the switch right off the bat," said Richard Jackson, a systems engineer at WorldSpan, a travel reservations firm in Atlanta. He agreed with Kitchens that options for linking Token Ring switches is a top priority. He said he is looking for a box with an FDDI uplink.

WorldSpan is in the early stages of evaluating a switch. For now, the firm sees these switches as a higher performance alternative to routers for linking many 4M and 16M bit/sec. Token Ring LANs.

New Product

RAD Data Communications, Inc. has announced RAD Maxcess-3000, a high-performance packet-switching bandwidth manager that integrates multiprotocol data, voice and fax over frame-relay or leased lines.

According to the Mahwah, N.J., company, RAD Maxcess-3000 is a high-capacity card nest that holds up to 12 system and I/O modules. Each port was designed to function as a trunk port or an I/O port. Any combination of 1/Os can be configured in the same card nest. It supports up to 36 voice/fax channels at rates up to 384K bit/sec. Modules can be inserted and removed while the unit is operating.

Prices start at $3,900.

Smoke alarm company's Web site rings up 267,521 hits.

The RS/6000 Web Server

You can't always tell how unexpected events will impact your Web site. But, with the RS/6000 Web server, you can be prepared for whatever business comes your way. You won't find a more scalable Web server. Or a more secure one. For the latest scoop, call 1 800 IBM-3333, ext. FA055, or drop by www.rs6000.ibm.com on the Net.
IBM grows server line, has Microsoft in sight

By Laura Di Dio

Users and analysts predict that IBM's beefed-up Software Server lineup will generate strong appeal among the installed base, but it will have a tough time attracting new customers.

The latest addition to IBM's server family is the Directory and Security Server (DSS) for OS/2. It will ship this month.

DSS for OS/2 provides a scalable directory and ensures users of secure Internet access. DSS for OS/2 is the latest offering in the ever-expanding family of servers that IBM is using to battle Microsoft Corp.'s BackOffice suite.

Worthy opponent

Analysis and users said Big Blue's lineup now rivals Microsoft's suite in terms of groupware, transaction processing, database, systems management and World Wide Web access features.

All seven IBM servers are available for OS/2, OS/2 Warp and AIX platforms. IBM has also expanded its support for Microsoft's Windows NT environment.

Frank Dzubeck, president of Communications Network Architects, Inc. in Washington, said IBM's aggressive product shipments are part of an overall strategy to boost momentum for its operating systems in the increasingly competitive operating system and network operating system markets.

Dzubeck said IBM has all the technical goods to make a horse race out of it — including the bundling of Notes and the leading-edge voice and speech recognition features that will be built in to the next version of OS/2 Warp, code-named Merlin.

"Now they must overcome the public perception that the [network operating system] and server software wars are over and [that] Microsoft is the clear and only winner," Dzubeck said.

Longtime OS/2 user Jess Hurwitz, vice president of technology at Parallel Storage Solutions, Inc. in Elmsford, N.Y., said although his organization has a mixed environment that includes OS/2/Warp, Windows NT and Novell, Inc.'s NetWare, it won't abandon the IBM server platform.

"OS/2 Warp Server is a very stable environment, much more so than Windows NT Server at this point. And we're really looking forward to deploying the DSS Server — it gives us much-needed directory services capability," Hurwitz said.

Parallel Storage will also use the DSS security capabilities.

"Many of our users are now routinely accessing the Internet. That will only increase with time, so we just can't afford to have any breaches," Hurwitz said.

IBM for the past several months has been bolstering the feature set in Merlin and its OS/2 Warp Server products.

Ready for prime time

Merlin initially was slated to debut in September but will ship later this month, according to sources close to IBM.

Ray Pratts, senior technical analyst at Variable Annuity Life Insurance Co. in Houston, a beta-test site for Merlin, praised the communications facilities of the operating system that let him connect "effortlessly" to servers running NetWare and AIX.

But Pratts lamented that there aren't enough mainstream applications out there yet for OS/2/Warp.

"If it's going to be a mainstream product, IBM has to get [independent software vendors] to develop more applications," he said.

"That's the crux of IBM's problem," agreed Jon Oltask, an analyst at Forrester Research, Inc. in Cambridge, Mass.

"The technical enhancements to the OS/2 Warp platform and the server suites are great stopgap measures for the installed base," Oltask said. "But without a wide range of applications, IBM can never hope to challenge Windows NT or NetWare."
The RS/6000 Web Server  In business today, you can't always predict how unexpected events will impact your Web site. But with the RS/6000 Web server, you can be prepared for whatever comes your way.

For example, RS/6000 UNIX servers can outscale anything out there, giving you the flexibility to respond to any business opportunity—whether it's around the bend or down the road.

Just as important, you won't find a more security-minded server. From authentication to access control, the RS/6000 provides a wide range of security features, each designed to prevent your data from falling into the wrong hands. And we offer RS/6000 Web servers with everything you'll need to get your Web site up and running fast, including IBM and Netscape software.

If you're serious about doing business on the Web, start with a serious server: the RS/6000 Web server. For our free guide, "Building Your Web Site," call 1 800 IBM-3333, ext. FE100. Better yet, contact our RS/6000 Web server at www.rs6000.ibm.com

Solutions for a small planet™
Top 10 Reasons to Subscribe

10. Computerworld's 71 reporters, editors, writers, and designers are still burning the midnight oil - even after the networks sign off the air.

9. Computerworld doesn't leave ink all over your fingers or make a mess like your daily newspaper.

8. You'll find quotable quotes from industry notables to put that know-it-all bass in his place.

7. You'll get bonus issues of Client/Server Journal, so you have the ammunition you need to sell your ideas to the CEO.

6. When you strut around your office with Computerworld under your arm, you'll be recognized as a person of great intelligence and technological vision.

5. If you're looking to shift your career into high gear, you'll appreciate Computerworld's Best Places to Work and our Annual Salary Survey - both free with your subscription.

4. Computerworld covers the world of IS until late Friday night, so you get all the latest breaking news delivered right to your desk.

3. Over 145,000 IS professionals already subscribe to Computerworld to get ahead of the competition. Way ahead.

2. The phone call and postcard are free. To subscribe, call 1-800-343-6474, or visit us on the World Wide Web at http://www.computerworld.com. To order by mail, use the postage paid subscription card bound into this issue.

1. At $39.95 for 51 information-packed issues, it's a no brainer.
Windows 95 utilities
Microsoft Corp. CEO Bill Gates likes to talk about PCs that will recognize spoken commands and use video input to monitor facial expressions. But for now, we're stuck with the Windows 95 interface, which you can talk to and make faces at all you want, but it won't run any better. Fortunately, the Internet can help.

Windows 95 is like an insecure spouse, always asking if you really meant what you said. The free RTVReco utility, from RTV Software in London (www.dansen.co.uk/rtvsoft/), offers an automatic way to say, "Yes, dear." Program in the title of a window, and when it pops up to ask you, "Are you sure you want to do something?" RTVReco will automatically click the "Yes" button.

Microsoft itself offers a few freeware Windows 95 interface add-ons, called PowerToys, at www.microsoft.com/windows/software/powertoys.htm. You can find tips for tuning Windows 95 networking and improving the user interface—including pointers to these and other useful software utilities—at www.creativeelement.com/win95.htm. The site, called "Windows 95 Annoyances," is from Creative Element.

By Kim S. Nash

Web security

Microsoft, Netscape trade shots; IS caught in the middle

Look for the NCSA label

Organization certifies Web sites that meet minimum security specifications

By Gary H. Anthes

The National Computer Security Association (NCSA) last week began offering a seal of approval for secure Web sites. NCSA certification will provide assurance to World Wide Web users and site providers that sites meet minimum security specifications. For example, it will assert that a site is protected by a firewall or other mechanism against attacks from the Internet.

The certification will provide a handy security checklist for Web managers, said Steven H. Haase, a senior vice president at Hamilton Dorsey Abson Co., an insurance brokerage in Atlanta. "There are many site managers who won't realize what they are doing wrong until they see [the NCSA’s] requirements," he said.

To get certified, an organization must submit to remote tests and a site visit by the NCSA, based in Carlisle, Pa. Certification, at a cost of $8,500, will be good for one year, during which the NCSA will perform random compliance audits.

Bank on it

Security First Network Bank, an electronic banking service in Atlanta, will seek certification to show customers that their electronic transmissions — and the bank’s systems and databases — are protected, said Michael S. Karlin, the bank’s president and chief operating officer.

"We offer our customers a no-risk guarantee, and we are insured by federal regulators. But there are still some that are nervous about banking on the Internet," Karlin said. "An NCSA certification icon will demonstrate the fact that we are security-conscious.

NCSA President Peter Tippett said the certification program could stimulate Web commerce by making users feel more secure.

"No single vendor or product can address the global problem of security on the Internet," Tippett said. "But certification of Web sites will lead to a significant reduction in risk as well as an improved perception of security across the net."

Tippett conceded that the certification offered assurance of only a minimal level of security but said it would at least tell users that the basics hadn’t been ignored.
The Internet

Tough firewalls help users avoid getting burned

By Gary H. Anthes

Firewalls are changing as fast as the Internet in order to keep up with new threats and changing usage patterns. Recent releases offer improved usability, audit tools, multigateway support, protection against malicious Java applets and more.

Users generally praised the new features. Ed Green, a network analyst at The Thomson Corp. in Stamford, Conn., said he used the new audit capabilities in ANS's InterLock firewall service to identify 30 non-work-related World Wide Web sites that employees were visiting regularly. "We introduced a company policy that makes non-work-related activities unacceptable," he said. "Now we're using the [Web address] filters to block access to those sites."

Because firewalls attempt to mirror often-complex user security policies, they can be tricky to set up and are unforgiving of errors. So vendors' efforts to simplify use are a welcome trend, said Bill Morgan, a staff consultant at The Dun & Bradstreet Corp. in Berkeley Heights, N.J.

"Too easy?" But Morgan warned of a potential downside to easy-to-use tools. "Now the people that administer the firewalls don't have to understand as much as they used to," he said. "So it's dangerous because now you might tend to push responsibility down to too low a level."

In the past several weeks, the following companies have released Internet security products:

• Trusted Information Systems, Inc. in Glenwood, Md., announced Version 3.2 of its Gauntlet Internet Firewall. It blocks Java applets from attacking corporate hosts and can be managed from a central site. It also has the ability to encrypt communications among remote users and the corporate network.

• Raptor Systems, Inc. in Watertown, Mass., introduced new versions of its Unix- and Windows NT-based Eagle firewalls. Eagle 4.0 for Unix offers encryption to secure data that travels over a public network. It also allows users to restrict specific Internet Protocol (IP) applications, such as Telnet, from passing over virtual private networks.

• Network-1 Software & Technology, Inc. in New York said its FireWall/Plus 2.0 filters IP packets and can block other protocols as well. Company officials said this feature is important for protecting the network from employees on the inside, where non-IP protocols abound.

• ANS, an America Online, Inc. company in Elmsford, N.Y., added auditing and reporting tools to its InterLock firewall service. ANS also added a filter that allows administrators to block access to particular Web sites and the ability to block the import of Java applets.

• Seattle Software Labs, Inc., an Internet security start-up in Seattle, announced a firewall aimed at smaller organizations that want simple, inexpensive protection. The $2,995 software/hardware combination employs expert rules to help ensure error-free setup, and it produces alerts and reports of suspicious events.

Rik Parrow, an independent Internet security consultant in Sedona, Ariz., said firewalls can become too flexible and invite administrators to cave in to every demand for Internet access by end users.

He said that as companies turn to firewalls to protect multiple intranets from employees, features that allow centralized management of remote firewalls are becoming important.

Continued from Page 1

The Internet

Tough firewalls help users avoid getting burned

By Gary H. Anthes

Firewalls are changing as fast as the Internet in order to keep up with new threats and changing usage patterns. Recent releases offer improved usability, audit tools, multigateway support, protection against malicious Java applets and more.

Users generally praised the new features. Ed Green, a network analyst at The Thomson Corp. in Stamford, Conn., said he used the new audit capabilities in ANS's InterLock firewall service to identify 30 non-work-related World Wide Web sites that employees were visiting regularly. "We introduced a company policy that makes non-work-related activities unacceptable," he said. "Now we're using the [Web address] filters to block access to those sites."

Because firewalls attempt to mirror often-complex user security policies, they can be tricky to set up and are unforgiving of errors. So vendors' efforts to simplify use are a welcome trend, said Bill Morgan, a staff consultant at The Dun & Bradstreet Corp. in Berkeley Heights, N.J.

"Too easy?" But Morgan warned of a potential downside to easy-to-use tools. "Now the people that administer the firewalls don't have to understand as much as they used to," he said. "So it's dangerous because now you might tend to push responsibility down to too low a level."

In the past several weeks, the following companies have released Internet security products:

• Trusted Information Systems, Inc. in Glenwood, Md., announced Version 3.2 of its Gauntlet Internet Firewall. It blocks Java applets from attacking corporate hosts and can be managed from a central site. It also has the ability to encrypt communications among remote users and the corporate network.

• Raptor Systems, Inc. in Watertown, Mass., introduced new versions of its Unix- and Windows NT-based Eagle firewalls. Eagle 4.0 for Unix offers encryption to secure data that travels over a public network. It also allows users to restrict specific Internet Protocol (IP) applications, such as Telnet, from passing over virtual private networks.

• Network-1 Software & Technology, Inc. in New York said its FireWall/Plus 2.0 filters IP packets and can block other protocols as well. Company officials said this feature is important for protecting the network from employees on the inside, where non-IP protocols abound.

• ANS, an America Online, Inc. company in Elmsford, N.Y., added auditing and reporting tools to its InterLock firewall service. ANS also added a filter that allows administrators to block access to particular Web sites and the ability to block the import of Java applets.

• Seattle Software Labs, Inc., an Internet security start-up in Seattle, announced a firewall aimed at smaller organizations that want simple, inexpensive protection. The $2,995 software/hardware combination employs expert rules to help ensure error-free setup, and it produces alerts and reports of suspicious events.

Rik Parrow, an independent Internet security consultant in Sedona, Ariz., said firewalls can become too flexible and invite administrators to cave in to every demand for Internet access by end users.

He said that as companies turn to firewalls to protect multiple intranets from employees, features that allow centralized management of remote firewalls are becoming important.

Continued from Page 1

Browser wars

Continued from Page 57

A race for quality

ANS is first out of the gate in a race to give users commitments on the quality of service they can expect in 'net connectivity. But ANS won't be alone for long. Officials at all the major Internet service providers said they plan service guarantees, and experts expect to see those materialize by year's end.

In May, officials at BBN Planet in Cambridge, Mass., said it was negotiating with major Internet providers, including MCI, PSinet and Sprint Corp., to provide service guarantees for customers of the companies. And last week, PSinet officials said it is developing plans to offer service guarantees for consumer Internet accounts. PSinet offers access to its backbone for other companies that, in turn, sell Internet access to consumers.

"They're measuring their network; I'm measuring mine, too. If I decide there's an issue with throughput, they have to prove to me there isn't. And if I'm not happy with the service, that's one of the items I can use to terminate the contract," Kreehoff said.

In addition to its commitments, the Elmsford, N.Y., company also offers service goals. Company officials said ANS will try to deliver response times of 70 msec or less between any two points on its backbone network — although that doesn't say how long it will take signals to reach the user premises. Likewise, ANS will try to deliver "port speed access," so that if a user pays for a 10M bit/sec. line, for instance, the user will receive 10M bit/sec. throughput at all times. ANS won't be penalized, however, if it doesn't meet its performance goals.

ANS is one of the dozen or so biggest Internet providers in the U.S. that are generally referred to as the backbone providers of the Internet. It is one of about 100,000 interconnected networks that compose the Internet. ANS has a 45M bit/sec. network that stretches across the continental U.S. and covers Hawaii. Comparable Internet backbone networks include those of AT&T, PSinet, UUnet and MCI Communications Corp.

Poor notice from Netscape about its fast-paced release schedule interferes with IS project planning, Hartman said.

No winner

Neither Netscape nor Microsoft will win the browser war, said Thomas Koulouloupolos, president of Delphi Consulting Group in Cambridge, Mass.

In a recent survey of 400 companies, Delphi found that 28% said Microsoft's browser will be standard, and 10% favored Netscape's. Regardless of whether those particular figures pan out, what is significant is the other 70% that said they will use something as yet unknown. But until that happens, IS wants to avoid the pitfalls of development that arise when using two incompatible browsers — regardless of what Netscape or Microsoft wants.
It's not rocket science
Design tool promises reduced consulting fees
By Julia King

Many companies building new client/server systems start by shopping for outside experts with architectural, network and application development expertise.

Now, Client/Server Connection Ltd., in Mount Kisco, N.Y., is packaging all three in CS/10,000, a $10,000, first-of-its-kind system design tool that could save users tens of thousands of dollars in consulting costs.

Based on expert system technology, CS/10,000 contains a series of automated, intelligent questionnaires, whose answers generate custom methodologies for building new client/server systems.

For example, the first questionnaire gathers users' business and technical requirements. With this information, the system issues a choice of appropriate architecture and network blueprints from its inventory of more than 125 designs.

From there, users can drill into a 3,000-item repository of development, middleware and networking products to complete the plan.

In short, the tool automates many design tasks that companies now look to consultants to perform, said Richard Hunter, research director at Gartner Group, Inc.'s application development and management practice in Stamford, Conn. "It gives companies a way to build a project plan on something besides their own experience without having to invest in a critical mass of skilled experts," he said.

System integrators and Big Six companies have had methodologies on the market for years. What makes the CS/10,000 methodology unique is that it doesn't take an expert to implement it, Hunter said.

Based on responses to subsequent questionnaires, the system also calculates project costs, generates project plans—including detailed task lists and project milestones and deadlines—develops requests for proposal and calculates an estimated return on investment.

"Our university charter calls on us to support the community," said Joe Askins, Arizona State's director of data communications and an Aztec founder.

"Our university charter calls on us to support the community."

Joe Askins
Arizona State

By Patrick Dryden

PHOENIX

Information technology professionals here in the heart of Arizona have donated their time, expertise and network bandwidth to open up the Internet to anyone who wants access.

They help maintain a nonprofit organization called Arizona Telecommunication Community Computing (Aztec), which provides free access to local and state information, discussion groups, Internet electronic mail and links from terminals in libraries and other sites.

"We're filling a gap for those who don't have the technology at home or maybe don't even have a home," said Derwin Skipp, a systems programer at Arizona State University in Tempe.

Skipp helped local United Way agencies computerize their operations before volunteering to babysit a donated server that hosts Aztec.

A few hours a month is all it takes, he and others said.

Share the wealth
"It almost sounds corny, but I believe the Internet can only be truly democratic when everyone can share the information and the power," Skipp said.

This Phoenix-area community service network is based on the Free Net goals and software created by the National Public Telecommunications Network in Cleveland. That project sought to make information available publicly. About 100 Free Nets operate in North America. But unlike other Free Nets, Aztec now reaches statewide and is free to residents.

The state library has donated $50,000 to fund Aztec, and Digital Equipment Corp. and AT&T Corp. supplied the initial server and Free Net software. Cisco Systems, Inc. donated a communications server, Arizona State shares its statewide network backbone capacity and many unsung heroes recycled their old PCs and modems after upgrades.

"Our university charter calls on us to support the community. So we spare some bandwidth and loan older computers to halfway houses and agencies to equalize Internet access," said Joe Askins, Arizona State's director of data communications and an Aztec founder.

Trying to close the gap
Internet demographics show most users to be affluent and college-educated, a profile attributable to the high cost and limited availability of access.

That user profile holds true despite efforts of online service providers, said Bill Austin, program manager at Motorola Space and Systems Technology Group in Scottsdale, Ariz., and an Aztec director.

"This is a critical way to close the gap between the have and have-nots," Austin said.

Residents of Arizona's retirement communities can provide their insight through Usenet discussion groups "to feel useful and more valuable," Austin said. Members can search for jobs, contact prospective employers via E-mail and learn about a company from its World Wide Web page prior to an interview.

The underprivileged and homeless can find resources and participate in the evolving job market, said Mark Goldstein, president of International Research Center, a telecommunications researcher in Tempe. "You can't be a player in the modern world without E-mail."

(www.computerworld.com) AUGUST 5, 1996 COMPUTERWORLD
State's broadband net promises better access

Virginia hopes to attract businesses

By Kim Girard

The Commonwealth of Virginia is joining a small but growing group of states building high-powered broadband networks to improve their schools, increase their competitive edge and lure business.

The state recently inked two seven-year contracts with Sprint Corp. and Philadelphia-based Bell Atlantic Corp. They were chosen over rivals AT&T Corp. and MCI Communications Corp. Sprint is providing long-distance access via a Synchronous Optical Network backbone. And Bell Atlantic's Asynchronous Transfer Mode (ATM) service will enable users to transmit voice, data and interactive video simultaneously on the network.

"They offered us the best service at the best price," said Patri-...
Any company can say they offer great middleware.

Only one can say it offers the number one.

Sybase EnterpriseCONNECT
The leader in interoperability.

The fact is, EnterpriseCONNECT is the leading middleware solution. With customers in every industry, we've connected more systems, databases and environments than anyone else. It's called Universal Connectivity: allowing any user, any platform, at any location to connect to any data in the enterprise. Maximize your data and integrate it with exciting and new technologies. To find out how we can help solve your business problems, just call 1-800-8-SYBASE, code 3824.

Or, buzz our Web site. www.sybase.com
WATCH THE MONEY!
Paul Strassmann says corporate America's increasing thirst for information technology requires new thinking about IT spending. Page 64.

Managing

Timing

When Hallmark Cards, Inc. ships a truckload of party goods to a supermarket or drugstore chain, it's not just business. It's test time.

If a store orders The Hunchback of Notre Dame party plates and the movie is released June 21, "...I need all the stock I ordered, and I need it in my store when the movie hits the theater," says John Flagler, an information technology manager at Hallmark in Kansas City, Mo.

Ninety-nine percent of the time, Hallmark fills its orders properly, Flagler says. But if a supplier bungles enough orders, a retailer may fine it thousands of dollars because of the work involved to sort out the confusion and the sales lost because there are no products on the shelf.

Hallmark has long fed sales information from stores' point-of-sale (POS) scanners into its decision-support system (DSS) applications. Hallmark managers use those applications to analyze sales trends and forecast demand. Those systems can automatically order the shipment of replacement products to stores.

But Hallmark is going even further, adding data about its own distribution system to the DSS to ensure orders get where they're going on time. That data could include, for example, information about which past orders couldn't be filled because of heavy demand and how production should be increased in response.

Growing trend
The move to link decision-support and operational systems is emerging as a critical issue for information systems managers as companies try to streamline their inventory and distribution systems. To have users do their analysis on a DSS and then manually enter orders into a separate operational system creates the potential for error and takes more time. Electronic links between the systems are more efficient, but they are so complicated and expensive that only the largest, most aggressive companies have forged them.

For one thing, "There are few retailers out there who have a fully functional, robust DSS environment," much less the ability to link them to operational systems, says Keith Hammer, vice president and chief information officer at Crown Books Corp. in Landover, Md. Hammer also worked in IS for 11 years at electronic retailing giant Circuit City Stores, Inc.

That is because many DSS systems require data warehouses to combine data from different legacy applications. Before users can query the warehouse, the data in it must be reformatted, checked for accuracy and reorganized. The key business managers must agree on what information is most important, how it

To react more quickly to market trends, companies are linking their decision-support and operational systems. But it's a struggle.
Yes! Send me the “Achieving Universal Connectivity with Sybase Middleware” video.

Please complete all questions on this card and mail, or fax it to 1-303-294-3739 or call 1-800-8-SYBASE.

Please provide the following information:

- Do you have a budgeted middleware project? [ ] Yes  [ ] No
- Is your budget over $100,000?  [ ] Yes  [ ] No
- What is your purchasing timeframe?  [ ] 0 - 3 months  [ ] 4 - 12 months  [ ] Over 12 months

Are you interested in:
- [ ] Data Access/Integration
- [ ] Objected-oriented Middleware
- [ ] Replication/Data Movement
- [ ] Internet/Intranet Integration

Are you a:  [ ] VAR  [ ] ISV  [ ] End User  [ ] Systems Integrator
 [ ] Consultant

What are your current data sources?  [ ] DB2  [ ] AS/400  [ ] Oracle
[ ] Informix  [ ] Sybase SQL Server
[ ] Non-relational/Mainframe
[ ] Other:

With what federal agency are you affiliated?  [ ] Armed Services  [ ] Civilian  [ ] DOJ/Other

Please affix peel-off label and make any necessary corrections to your name/address.
To market, to market

Products that link decision-support and operational systems are still rare, but the demand from retail customers—who want to squeeze excess costs and inventory out of their supply chains—has prompted some vendors to try to fill the void.

The most visible is INTREPID SYSTEMS, INC. in Alameda, Calif., which is integrating its Evolution retail operational system with its DecisionMaster decision-support software. This merged product will be available in the first quarter next year on IBM's AS/400 midrange platform and Windows NT. The company plans to port the system to Unix, with general availability sometime next year. The software will cost between $550,000 and $1.25 million. It will be aimed at retailers with annual sales of at least several hundred million dollars, company officials say. Intrepid can be reached at (510) 769-4888.

JDA SOFTWARE GROUP in Phoenix offers some integrated DSS and operational functions through its software products and consulting services. Its Distributed Store System runs on DOS-based POS systems. It can perform such functions as consumer preference tracking and is tightly integrated with JDA's AS/400-based Merchandise Management System. JDA can be reached at (602) 494-5500.

Legacy can be reached at (617) 273-5400.

Customers who replace their operational and DSS systems may have an advantage because they can build both systems from a common data model.

Crown Books, which hopes to fine-tune inventory and distribution functions to improve its third-place position in the discount bookstore market, is relying on Intrepid to implement its operational and DSS systems.

Hammer says he's confident that Intrepid can deliver both critical systems, but at least one other retailer found his DSS implementation delayed when an outside company failed to deliver on its promises.

At Farmers Furniture Co., a $150 million furniture retailer based in Dublin, Ga., Morton Mease is also creating new decision-support and operational systems.

Mease, vice president of IS at the firm, aims to bring "consistency and compliance" to how the company's 108 stores do everything, from ordering merchandise to handling returns.

When they are completed late next year, the systems should streamline the chain's distribution system and pinpoint the best markets for its stores and the most profitable suppliers, according to Mease.

Mease is developing new DSS and operational applications at the same time. The applications will replace a "very rudimentary" DOS-based DSS system in each store with new Windows NT-based systems that will access a data warehouse scheduled for completion in early 1998.

Mease says he plans to use the World Wide Web to allow stores to upload order information to the host, which will place orders with furniture manufacturers.

Whether it is a giant such as Hallmark or a regional player such as Farmers Furniture, the question isn't whether to link DSS applications to operational systems but when and how.

Scheier is a Computerworld senior editor, management.

Giving credit to client/server

Corporate bean counters in the U.S. see big benefits in moving their firms to client/server technology, even if the reasons aren't purely financial, according to a survey of financial managers and officers at 2,000 firms.

The top reason according to 25% of respondents: improving accessibility of information. Increasing productivity was second at 18.98%, and enhancing analytical and reporting capabilities was third at 9.72%. Respondents were asked to rank the Top 4 reasons their firms switched. The percentages are weighted according to their rankings in each survey response.

The survey of the Controllers Council of the Institute of Management Accountants says 45% of the respondents said their firms have implemented client/server, up 3% from a 1995 survey, and 27% plan to.

Also, 44% of the respondents said the shift to client/server was worth the cost, 37% said it was too early to tell, and 19% said the investment wasn't worth the outlay.

Council members are responsible for company investments, cash, budgets and forecasts.

Another recent survey says some of those who control the books may be working with some new client/server applications. The study, conducted by International Data Corp. in Framingham, Mass., says client/server applications will continue to expand, with accounting (37.5% of respondents said it was most likely to be deployed) and payroll departments (32.5%) leading the way.

--- Rick Saia

Year 2000 program starting up

The Atlanta-based Information Management Forum, a professional association for IS executives, is forming a working group on the year 2000 issue.

Project planning, awareness programs, tool evaluations and vendor issues are some of the topics to be explored. Meetings will begin in the fall. To join, contact Jim Jones, managing director of the forum, at (770) 455-0070 or via the World Wide Web at www.infomgmtforum.com. Or send electronic mail to tim@mindspring.com.

Calling all anecdotes

A week usually doesn't go by in an IS organization without a funny story or two to tell your family and friends. Got some tales you'd like to share with us?

Just send them to:

RICK SAI A

Associate Editor/Managing

Computerworld

500 Old Connecticut Path

Framingham, Mass. 01701

(E-mail: rick_sai a@cw.com)
Managing

**Information: America's favorite investment**

M

oney talks. And it talks more clearly about priorities than anything else. If you look at the statistics, information has become the most important way for companies to invest in their future.

Information technologies — computers, telephony, video, etc. — have become the preferred business tooling investment for U.S. corporations. And more corporate cash is spent on information management than on the annual costs of shareholder equity, according to my calculations.

The shift is so striking that one may rightfully designate the U.S. as having entered the Computer Age after 1982, in the same way that historians describe evolutionary progression in terms of the Stone, Iron or Automobile ages. After all, civilizations are defined by the tools they use. But this epoch-making shift has other ramifications for chief information officers and how information systems payoffs should be measured.

**Well-funded expenditure**

Business tooling is defined by economists as producer-durable equipment and is one of the most telling indicators of business priorities.

The number of executives who say they will increase spending on computer hardware and software has more than doubled in the past five years. Computer purchase plans are funded better than expenditures for all other business tooling.

This shift in preferences is best illustrated by showing the relative shares of capital spending in recent history (see chart below left). Skeptics may argue that a better measure of the priority given to information is how much of a company's revenue is invested in information technology. But that is a misleading indicator.

The costs of information technologies average only 2% of a firm's revenue, but they can have an enormous influence on a firm's operations. They have become the principal means of improving existing business processes. Just as in the human body, the relative weight of critical organs, such as the kidneys, isn't a good indicator of their importance.

**Just a small piece**

Computers make up only a small share of the total information costs of a firm because most of these expenses are for executives, managers, administrators, clerical and technical staffs or for technology purchases.

Computers also make up only a small share of the costs of a firm's assets — averaging less than 0.3%.

Therefore, a better way to assess the relative importance of information is to calculate the ratio of the costs of information management — which I define as sales, general and administrative plus research and development expense — to the costs of shareholder equity, which is the net value of all assets minus liabilities.

A firm's ratio of information management to shareholder equity is the most appropriate indicator of whether a company is information-intensive or capital-intensive. If a firm is overwhelmingly information-intensive, the role of the CIO rises in importance for assuring the success of the enterprise. I have calculated this ratio for 2,186 major U.S. corporations. The results are best illustrated below (see chart below right).

Some 1,926 corporations spent more on information management than on shareholder equity in 1994.

Only 260 firms, or 11.9% of U.S. companies, were found to depend primarily on shareholder capital as the most important input resource. About 70 years ago, capital would have dwarfed information costs.

**Implications**

The increased reliance on computers as a business tooling investment while corporate costs shift from capital to information has far-reaching implications:

- The CIO should concentrate on enhancing the effectiveness and productivity of information management, not the efficiency of computers. Even large reductions in the expenditures for computers can't impact profits as much as a small gain in the effectiveness of information management.
- The conventional measures of payoff on invested capital — return-on-assets or return-on-investment — are increasingly irrelevant. These ratios, inherited from the industrial era of scarce capital, evaluate the productivity of something that is of diminishing importance. Instead, CIOs should assist corporate executives in applying better measures in evaluating the productivity of people who are engaged in the use of information resources.

Strassmann has been trying to explain spending on information technologies since 1955. He can be reached at www.strassmann.com.
I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of $39.95 per year— a savings of over 73% off the single copy price.

First Name: 

Last Name: 

Title: 

Company: 

Address:  

City: 

State: 

Zip: 

Address Shown: 

Home  

Business  

New  

Renew  

Single copy price: $3.00/issue  

U.S. Only. Canada $9.00, Mexico, Central/South America $15.00, Europe $29.50, all other countries $29.50.

Please complete the questions below.

1. BUSINESS/INDUSTRY (Circle one)
   10. Manufacturer (other than computer)
   20. Finance/Investment/Real Estate
   30. Manufacturing
   40. Wholesale/Retail/Trade
   50. Government - State/Local
   60. Communications/Television
   70. Banking/Insurance/Real Estate
   80. Computer/Peripheral Dealer/Dist./ Reseller
   90. Other  

2. TITLE/FUNCTION (Circle one)
   10. President, VP, Executive Vice President, Director
   20. Senior Programmer, Systems Analyst
   30. Management Information Systems, MIS, Computer Planning
   40. Systems Integration, VAR, Computer Service Bureau, Software Planning & Consulting Services
   50. Computer/Peripheral Dealer/Dist./ Reseller
   60. Other  

3. Do you use, evaluate, specify, recommend, purchase (Circle all that apply)
   (a) Solaris
   (b) Netware
   (c) DEC
   (d) Unix 

4. How many people are employed at this location and in your entire organization, including all of its branches, divisions and subsidiaries? (Select only one per column)
MANAGEMENT


HOT HAPPENING — Computer Training and Support Conference and Expo. Nashville, Sept. 8-11 — Contact: SOFTEK Institute, Medford, Mass. (617) 393-3636. Fax: (617) 393-3636.

Electronic Commerce World '96. Columbus, Ohio, Sept. 6-7 — Contact: EDN World Magazine, Hollywood, Fla. (800) 336-4887. Fax: (954) 925-7533. E-mail address: edworld@ix.netcom.com. Web address: www.edworld.com

ServiceTech '96: Conference on Innovation in Services Technology. Boston, Sept. 9-12 — For managers who make decisions about implementing new systems in the following core areas of services technology: call management, problem resolution and telecommunications. Contact: American Institute for Foreign Markets, Ft. Myers, Fla. (916) 275-7087. Fax: (941) 275-0794. E-mail address: afmi@afmi.org

Corporate Universities Enter the 21st Century. Schaumburg, Ill., Sept. 5-6 — Contact: Quality Dynamics, Inc., New York, (800) 946-1210. Fax: (212) 626-6979. E-mail address: ALemcorpu@aol.com

The Field & Sales Force Automation Conference. Boston, Sept. 10-12 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-0525. E-mail address: ConReg@dciexpo.com. Web address: www.DClexpo.com

Year 2000 Conference & Expo. San Francisco, Sept. 11-13 — Contact: Software Productivity Group, Westboroug, Mass. (566) 3344, ext. 227. Fax: (508) 366-8030. E-mail address: info@spgnet.com. Web address: www.spgnet.com

AFCOM '96 Fall Conference and IF Expo Trade Show. Miami Beach, Fla., Sept. 29-Oct. 2 — Contact: Association for Computer Operations Management, Orange, Calif. (714) 997-7966. Fax: (714) 997-9743. E-mail address: afcom@afcom.com. Web address: www.afcom.com


Firewalls and Web Security. San Jose, Calif., Sept. 30-Oct. 1 — Contact: National Computer Security Association, Carlisle, Pa. (717) 258-1816, ext. 224. Fax: (717) 243-8642. E-mail address: ksvevers@ncsa.com


USER GROUPS

PictureTel User Group Conference. Long Beach, Calif., Sept. 8-11 — Contact: Catherine Takacs, PictureTel User Group, Morristown, N.J. (800) 784-4636


TECHNOLOGIES


SAP R/3 Implementation. Dallas, Sept. 9-10 — Contact: IBM USA Conferences, Inc., Southboro, Mass. (508) 481-6400. Fax: (508) 481-7911. E-mail address: reg@ibcusa.com

Technology Forecasting Workshop. Austin, Texas, Sept. 9-11 — Contact: Technology Futures, Inc., Austin, Texas. (800) 748-8898. Fax: (512) 258-0087. Web address: www.tf.com. E-mail address: info@tf.com


Engineering and Manufacturing Enterprise Solutions. Boston, Sept. 10-12 — Contact: The Institute of Electrical and Electronics Engineers, Inc., Andover, Mass. (800) 267-2336. Fax: (508) 470-0525. E-mail address: ConReg@dciexpo.com. Web address: www.DClexpo.com

Network World Unplugged Exhibition. Boston, Sept. 11-12 — Contact: Digital Consulting, Inc., Andover, Mass. (800) 532-3976. Fax: (508) 470-0526. E-mail address: ExpoReg@dciexpo.com. Web address: www.DClexpo.com

HRMS/EXPO '96: The National Human Resources Information Technology Expo & Conference. Dallas, Sept. 11-13 — This is a major show for those whose information systems staffs support the human resources function. Contact: Blenheim NDN, Mountain View, Calif. (512) 232-3976


IMA Expo (Interactive Multimedia Association). New York, Sept. 17-19 — This new trade show is being cosponsored by International Data Corp. and the industry's major association. Contact: Infotainment World, San Mateo, Calif. (800) 3MA-3519

Data Warehousing Conference. Phoenix, Sept. 17-19 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880. Fax: (508) 470-0526. E-mail address: ConReg@dciexpo.com. Web address: www.DClexpo.com

Solutions Summit: Messaging and Intranet Integration. Santa Clara, Calif., Sept. 24-27 — Contact: EMS Solutions Summit, Baltimore. (703) 524-5550. Fax: (703) 524-5558. E-mail address: meet@ema.org. Web address: www.ema.org

INTERNET

Internet & Electronic Commerce Conference & Exposition. San Francisco, Sept. 4-6. Contact: Expocon, Fairfield, Conn., (203) 256-4700, ext. 100. Fax: (203) 256-4730. E-mail address: ic@expocom.com. Web address: www.expocom.com


National Conference on Commerce in Cyberspace. Crystal City, Va., Sept. 11-12 — Contact: CERCA (Council for Electronic Communication Advancement), Chicago, (312) 644-6640, ext. 3435. Fax: (312) 527-6688

Look to our Web site (www.computerworld.com) for information on upcoming workshops and conferences.

Calendar announcements should be submitted at least eight weeks prior to the event and include the title of the event, dates, location, theme or focus, keynote or major speakers, principal topics and a contact person, organization and phone number.

SEND ANNOUNCEMENTS TO Rick Sales, Associate Editor/Managing, Computerworld, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax: (508) 875-8953
HOW DOES 50% FASTER SOUND? Probably like a dream for those seeking a smarter way to manage data. In that case, the Symbios Logic MetaStor SH4000 intelligent storage hub is a dream come true. It’s a new storage system that attaches directly to your network and significantly increases throughput. Better still, it’s from Symbios Logic, a leader in storage technology.

The solution to managing data across large networks isn’t as simple as adding disks or a new server, because general-purpose file servers aren’t optimized for centralized storage. The MetaStor SH4000 intelligent storage hub is. It’s all about I/Os and an astounding NFS Ops of 1,350. While storing up to 252 GB, it supports more users and reduces response time. It eliminates bottlenecks, automatically backs up and restores, conserves network resources and controls costs.

And the dream gets even better. Because the intelligent storage hub includes high-bandwidth RAID, an industry-leading 99.99% data availability, and an integrated five-DLT-drive tape array for 400% faster backup. And to meet future needs, it’s designed for easy expansion.

So if you’ve been waiting for centralized storage with blazing I/Os, relax. The MetaStor SH4000 intelligent storage hub is here. To learn more, call Symbios Logic at 1-800-86-ARRAY, or visit our Web site at http://www.symbios.com.

The MetaStor intelligent storage hub attaches directly to your network, increasing data throughput by up to 50 percent.

© 1996 Symbios Logic Inc. Symbios Logic and MetaStor are trademarks of Symbios Logic Inc.
A historic summit brings reminiscence, to be sure, but these pioneers' eyes are squarely on the future — of computing, business and society

By Paul Gillin

The computing industry brainpower that gathered at Thomas Jefferson's spectacular Monticello home in April was astonishing. A joint effort of Computerworld and the Smithsonian Institution, the Monticello Memoirs program is an ongoing project to document the history of the industry as told by those who shaped it.

I had the opportunity to spend two days with this remarkable group of inventors. I had expected the participants to be reflective and circum-
Monticello Memoirs
CONTINUED FROM PAGE 67

spect about the technology changes they had implemented. I was wrong. Energetic and impatient, the panelists spent more time planning for the future than reflecting on the past.

For Jay Forrester, whose 1950s Whirlwind computer was a seminal invention in the industry, the crisis in education threatens to swamp computerization benefits. For Seymour Cray, father of the supercomputer, the challenge is to build computers that grow and learn like biological organisms.

Ethernet inventor Bob Metcalfe blasted telecommunications deregulation for sparking corporate mergers instead of technology innovation. Microprocessing pioneer Gordon Moore said that his famous Moore’s Law — in which price/performance doubles every 18 months — has a good 10 years of life left and that we haven’t a clue about what changes are in store. Gordon Bell, the brilliant engineer, railed against industry standards wars.

Far from satisfaction, the participants in eight hours of meetings expressed restless concern that their accomplishments become a long-term positive force for change in the world. Not content to rest on their laurels or count their stock options, they fretted and debated, joked and pontificated, but ultimately they came together in a deep mutual respect for one another and for the changes they had wrought.

As a frontier, I see science and technology drawing to a close. Now it is very much a production line. You want a new scientific idea, you get some money, you hire some people, you give them a building, you expect to get what you want with a fairly high probability — and that’s just like making refrigerators.

The new frontier, as I see it, is understanding our social and economic and political systems, in which the understanding has not advanced substantially in the last 2,000 years. I think the work I’m doing in K-12 is at least one step in creating a population that is on the road to understanding that frontier, which will extend into at least the next 50 years.

If we look at universities, we see a lack of courage in working on the big and the important problems. It is no harder to work on a really big, important problem than it is to work on a little, unimportant one. And therefore, you should set your sights at the top of the list: What is it that matters to the future? It means looking at the problems that have persisted for a thousand years unsolved and what you can do dramatically in the reasonably short run to change the direction of the world.
Most of the people I ask, when offered the choice between twice the bits per second on their desk or twice the instructions per second on their desk, would prefer twice the bits. And that's a consequence, I think, not of technological lagging but of poor design of an industry — namely, the monopoly approach to telecommunications.

In '68 and the early '70s, we eliminated the phone companies' customer premises equipment monopoly. We later overthrew the monopoly in long distance. This year, we were supposed to overcome the monopoly in local telecommunications. And we passed the Telecom Act of 1996, which, as far as I can tell, is a missed opportunity. What we're seeing is a further agglomeration of these companies, which are too big and too powerful and too monopolistic.

We have the Luddites and the socialists on the run, and we ought to keep them on the run. I think competition and choice are the solutions to most problems. We should steer away from solutions that lead us to single solutions and no choice.

E-mail today is flattening organizations and making communication different. And that all leads to restructuring, although we don't want to say that very loudly as computer people. I think the same thing is going to happen in the Internet. Already you hear examples of pipeline development: Design it in India, and test it in Ireland and market it in California. . . .

These bytes get awfully boring. Another language, another application — they all look alike. I would like a moratorium on browsers for a year. I mean, I love the Internet. It's a joy to use — but hey, a year without a new browser would be a really welcome relief.

In the future, I see massive opportunities as an engineer to build things — to build virtual spaces, to really do telework. That's what I happen to be interested in. But I can look at the other side, too, and see tremendous dislocation.

My father was a test technician, and my mother approved, and so I went to MIT and fell into computer networking in 1960. Worked on the Arpanet, then at Xerox's Palo Alto Research Center, where it was my good fortune to be given the job of networking early personal computers, and there I invented Ethernet on May 27, 1973.

After eight years, I went off and started a company because it was the thing to do in Silicon Valley. I started a company called 3Com, where I worked for 11 years, and retired in 1990. In 1990, I became a journalist, a computer trade journalist. I now write columns for a newspaper called InfoWorld.

I began my career as an electrician. Went to MIT, became a Fulbright student, then in 1960 worked on the invention of the minicomputer, the concept of putting computers with other things and building the first commercial time-sharing computer.

In 1960, I went to Carnegie Mellon (CMU) as a computer science professor. Stayed there until '72. Wrote a book with Alan Newell on computer structures that was sort of a textbook for several years.

In 1972, I took leave from CMU and went back to [Digital Equipment Corp.], ran DEC Engineering for 12 years. Did the VAX and the VAX VMS, was responsible for all the R&D at DEC. When I left DEC, I got involved in a number of start-ups.

Then I went to the National Science Foundation to start up the computer science directorate. After my short career as a bureaucrat, I've been involved with start-ups ever since. Thought I would never be working in another company, and then last year, Microsoft persuaded me to work half-time.

Robert Metcalfe

Gordon Bell

E-mail today is flattening organizations and making communication different. And that all leads to restructuring, although we don't want to say that very loudly as computer people. I think the same thing is going to happen in the Internet. Already you hear examples of pipeline development: Design it in India, and test it in Ireland and market it in California. . . .

These bytes get awfully boring. Another language, another application — they all look alike. I would like a moratorium on browsers for a year. I mean, I love the Internet. It's a joy to use — but hey, a year without a new browser would be a really welcome relief.

In the future, I see massive opportunities as an engineer to build things — to build virtual spaces, to really do telework. That's what I happen to be interested in. But I can look at the other side, too, and see tremendous dislocation.
In Depth

Monticello Memoirs
CONTINUED FROM PAGE 69

I grew up as a chemist. Started making nitroglycerin in my home laboratory. Finally got a Ph.D. from Cal Tech. I got into the semiconductor business about the time the silicon arrived in Silicon Valley.

I was Bill Shockley's 18th employee with a little operation he was setting up out there. I was one of the eight founders of Fairchild Semiconductor. Then was a founder of Intel in 1968. I have been with Intel ever since. I gave up being CEO in 1987, but I still kibitz on what's going on there and find out what's going on in the world. It's too exciting to pass up.

I was fortunate to graduate from the University of Minnesota at just the right time to be at the beginning of computers. Went to work for Engineering Research Associates, which was doing Navy contracts for cryptographic work. Engineering Research Associates was acquired by Unisys, and I left that in 1957 to start Control Data Corp.

I stayed there until it got big and ugly, and then I started Cray Research until it got big and ugly, then I started Cray Computer. So my claim to fame is perseverance. I've managed to accumulate more miles than anyone else in the supercomputer business.

Seymour Cray

We've seen a tremendous change in the nature of our employment. We used to have a lot of jobs for people who depended on their manual dexterity; we tested them under a microscope to see if they could manipulate things. Now we test them for reading knowledge of English and ability to learn computer skills. We essentially have none of the jobs that were most prevalent only 20 years ago.

Increasingly, society is being split into two classes based on education. To me, that's a major concern. We talk about getting rid of barriers across the world, but we're really getting rid of barriers among 30% of the population. And 70% of the population are nonparticipants in the information revolution.

I don't think it's fair to burden the corporation with the responsibility for the jobs they didn't create because they bought advanced machinery. Remaining competitive in this world is, frankly, a full-time job.

The corporation is uniquely set up to address that. The corporation is set up with a very narrow purpose of pursuing its best interests.

We lack challenges today as societies, as countries. We tend to fight a little less now — at least the large countries do — and so we don't have the problem of defending, and I think one of our great problems is we need a real challenge.

Now you can think of lots of challenges in everyday life, but those aren't the kinds of challenges that get people together. We need a common enemy. It doesn't have to be another country.

I think the Internet is the vehicle to bring people together, and I hope that will happen in the next few years. One of my hopes is that communication through the Internet worldwide will tend to break down nationalism. I think following communication will come transportation. After we talk to people all over the world and share our thoughts, we'll start to get together physically. We'll end up with a better world in the sense that we will share more things than we do now.
Computer Careers

Getting their due

AS/400 talent is suddenly in high demand — and short supply. The impact is finally forcing salaries to rise.

By Steve Alexander

Peter Koolek would like to hire an AS/400 programmer experienced in distribution, financial and manufacturing software. But after five months of trying, he's getting discouraged.

At the same time, several AS/400 programmers Koolek knows of have taken advantage of the high demand for their services. They've become independent contractors, says Koolek, director of information systems at Alfa Laval Separation, Inc. The Warminster, Pa., company manufactures fluid separation equipment for municipal waste treatment plants and U.S. Navy ships.

Koolek's frustration is only partly alleviated by the knowledge that he isn't the only one who's having trouble recruiting AS/400 professionals. A hiring boom has made programmer/analysts and managers in the AS/400 field hard to come by. As a result, salaries are rising.

"I think I'm having the same problem everyone else is having," Koolek says. "The really qualified candidates are moving to new jobs very quickly, and you have to know by word-of-mouth when somebody is leaving a job."

The hot AS/400 market is mostly due to an improved national economy, says Nate Viall, an AS/400 market researcher and recruiter. He is president of Nate Viall & Associates in Des Moines, Iowa, which publishes salary studies of the AS/400 market.

"The economy has been very solid, and both profits and revenues for companies are up. At the same time, the backlog is up in AS/400 application work, and companies are adding staff," Viall says. As a result, raise percentages "have more than doubled from [what they were] 12 to 24 months ago."

Another reason for the booming AS/400 employment market may be an increase in the number of AS/400 users. "We cataloged as many brand-new accounts for the AS/400 in the first half of 1995 as we did for the entire year of 1994," Viall says.

Koolek is relying on two contractors while he seeks a full-time employee. But he says he can't afford to keep doing it. "We're paying $90,000 a year for a contractor, whereas we should be able to find a good programmer analyst for $45,000 to $50,000," he says.

Randy Allen, chief administrative officer and chief information officer at Phillips-Van Heusen Corp. in New York, says it's hard to hire AS/400 personnel because "a lot of people migrated to client/server and sexier platforms, and that diminished the pool of AS/400 people." Her company is seeking five AS/400 developers who can do programming and analytical work.

Edward Wojciechowski has been hiring AS/400 programmers for the past 18 months and hopes to hire 16 more this year. "We have worked very hard at finding folks," says Wojciechowski, vice president of information technology at Maytag Corp., an appliance maker in Newton, Iowa. "We have seen the jump in salaries, but I don't think they are out of line. I think salaries may have jumped more because we're in catch-up mode."

Staples, Inc., an office-supply superstore chain in Framingham, Mass., claims to have the largest AS/400 shop in the Northeast. The firm's revenue is expected to rise to $4 billion this year from $3 billion last year, and business growth requires more AS/400 personnel.

In the past 12 months, Staples has hired approximately 35 AS/400 programmers and IS professionals with related skills. By next January, the company plans to hire twice that many or more, CIO Frank Andrews says.

The additional staff will be needed to handle expanded use of AS/400s in merchandising and, possibly, distribution, Andrews says.

John Marascia, an AS/400 recruiter at The Kleven Group, Inc. in Lexington, Mass., says the AS/400 hiring boom could last several years. But he doubts that salaries can continue their sharp annual increases.

"I think there has to be a tapering off. I don't see how they can continue to go up," he says.

Alexander is a freelance writer in Edina, Minn.
Regional Scope: Pacific Northwest

The New Silicon Valley?

High-tech firms are flocking to the Pacific Northwest, lured by the low cost of living and high quality of life

BY LYNN HABER

For years, Oregon and Washington have seen their economies bolstered by industries that rely on the area's natural resources, such as farming and logging. But times are changing in the Pacific Northwest, as an influx of high-technology and information service firms has prompted many to call this area the next Silicon Valley.

Firms in the Pacific Northwest tend to be in various stages of client/server development. This is fueling an ongoing demand for client/server, Windows, C and C++ skills. There are opportunities for mainframe talent here as well, but to a lesser degree. What that means to many information systems job seekers is a wealth of opportunity in a region considered one of the most livable in the country.

Portland: A bed of roses

Known as "The City of Roses," Portland, Ore., is blooming with IS job opportunities. Industries putting up help-wanted signs include electronics, financial services, high technology, retail and transportation.

Apparel companies such as Nike, Inc. in Beaverton, Jantzen, Inc. in Portland and Columbia Sportswear Co. represent a few of the Oregon manufacturers where IS jobs continue to develop. Jantzen is looking for IS professionals who have strong business backgrounds and groupware skills, particularly in Notes, says Frank Schneider, the company's IS director.

In the health care industry, Kaiser Permanente Northwest Region is rapidly expanding its IS department. The company has added 50 positions over the past five years, largely for people with PC skills, open architecture experience and familiarity with Microsoft Corp.'s Visual Basic. "We like to find people who are moving into their second or third IS job and can demonstrate competency," says Gary Hascher, application group manager at Kaiser. "Less important are mainframe skills."

In the insurance industry, Standard Insurance Co. in Portland reports a dozen openings in its IS department of 200. "We're a growing company with a number of IS jobs to fill," says Mary Gibbons, assistant vice president at Standard. In particular, the firm is looking for LAN administrators, project supervisors, process analysts and data analysts.

Seattle: Raining opportunity

If you can hack the rainy climate, Seattle is another mecca for IS job seekers. Demand here is high and largely unfilled.

In particular, the Seattle area continues to attract high-tech, mostly software development firms lured to the land of Microsoft. With 3,000 IS openings in the area, job seekers with experience are well-positioned in the market.

"Individuals with a few years of hands-on technical experience with relational databases, client/server, C and C++ are very much in demand here," says Dennis Fuhrman, managing director at Source Services Corp., an employment recruiter in Seattle.

Representing the state's more traditional industrial base of forest products is Weyerhaeuser Co. in Tacoma. Hiring at the company has slowed, but there is a need for data modelers, Internet developers and electronic data interchange specialists. "We continue to look for programmers, analysts, client/server developers and network engineers," says Kathy Richardson, staffing manager at Weyerhaeuser.

Blue Cross/Blue Shield of Washington and Alaska, based in Seattle, is looking to add about 15 employees to its 100-member IS department. Staffing contractor Robert Crista says he is interested in IS professionals who have three to five years of platform experience, sometimes more. The challenge: "Basically, there are a lot of companies looking for the same talent we are, paying competitive salaries," he says.

Portland's Mt. Hood, seen from the International Rose Test Garden

Haber is a freelance writer in Norwell, Mass.
If “dot com” are two of the most commonly used words in your vocabulary, we speak your language. We have one of the largest computer networks in the world—an internal intranet with over 50,000 web pages and growing daily. We also have an exploding client-server architecture that will employ distributed databases; object oriented technology; integrated video, data and voice to the desktop; mobile computing; virtual reality; groupware and a long list of other capabilities that grows by the minute. If it’s happening in the world of Information Systems, we have it. What we don’t have are enough Information Systems Engineers, Programmer Analysts, System Administrators and other computer wizards. If you’re interested in doing things that have never been done before, talk to us. We’ll understand. Opportunities are available in the Puget Sound area. Send your resume to The Boeing Company, P.O. 3707, M/S 6H-RC,CWHT86, Seattle, WA 98124.

An Equal Opportunity Employer Supporting Diversity in the Workplace.
SEND ONE RESUME AND WATCH YOUR OPPORTUNITIES MULTIPLY.

Just send your resume to the Thompson Virtual Job Fair.
Northern California/Pacific Northwest

It's a whole new way to get your resume into the hands of the right people, with a single stamp, call, fax or email. It's free.

Your resume is delivered directly to hiring managers' PCs in digital form, including all those listed here. (Except your current employer, if you so indicate.) Your resume is accessible through high-powered search software. It's the preferred way for candidates and companies to find each other. Send one copy of your resume any way you'd like.

If you don't have a resume, visit our Website to fill out an on-line resume form - http://www.jwtworks.com/tvjf

Please indicate your geographical preference. No cover letter required.

MAIL: TVJF Processing Center, 16476 Bernardo Center Dr., Suite 247, San Diego, CA 92128
FAX: 1-800-805-9227

PARTICIPATING COMPANIES:
- LOCKHEED MARTIN MANAGEMENT & DATA SYSTEMS - PRICE WATERHOUSE LLP - PCSI -
- CADENCE DESIGN SYSTEMS - GENIX INDUSTRIES - BANK OF AMERICA -
- ENHANCED MEMORY SYSTEMS, INC. - QUALCOMM INCORPORATED - AIRTOUCH CELLULAR -
- HEWLETT PACKARD COMPANY - MICROSOFT - INTERNATIONAL GAME TECHNOLOGY -
- SOLUTIONS IQ - ADVANCED TECHNOLOGY LABS - PACIFIC BELL -
- FRANCISCAN HEALTH SYSTEM - TVJF COM INTERNATIONAL - PROVIDENCE HEALTH SYSTEM -
- SEAPORT FIRST BANK - IG BOOKS WORLDWIDE - PACIFIC BELL MOBILE SERVICES -
- RAYMOND JAMES CONSULTING - ALLI-DASH/MCN

POSITIONS AVAILABLE
- UNIX Kernel and Compiler Developers - Engineering Technicians - System Analysts -
- HealthCare & Web Specialists - Online Financial Services Managers - Database Administrators -
- Network Designers - UNIX Operating System - Stress/Reliability Test Developers - Directors -
- Vice President - IS - System Development Managers & Administrators - EDI Auditors - GUI Developers -
- Engineers: UNIX ID Daries, Software Networking, Manufacturing, Fabrication, Software Development, Electrical, Consulting, VLSI & ASIC Design, IC Design/Test, RF, Data Communications -
- System Integration, Applications, Design Automation, DSH Digital Design, CAD, Design
- Strategic Planning, Hardware Design - Software Test and Honor Design

SKILLS SOUGHT
- HP-UX 11.0 - SAP R/3 - ABAP - SPICE - MVS - DB2 - CICS - Notes - Windows NT - AIX -
- TCP/IP - HTTP - HTTP Servers - SYBASE - ORACLE - HTML - SQL - Solaris - SQLI - TSO/ISPF - COBOL -

EEO/AA Employer.
Advanced Technology. Traditional Success.

As a very successful provider of life insurance and retirement plans for more than four million customers nationwide, Standard Insurance Company recognizes the importance of a sound, prudent approach to financial investment. But when it comes to our IS efforts, the creative use of technology to solve business problems is absolutely essential. We're currently seeking IS professionals with broad-based expertise and a commitment to innovation. When you join us, you'll experience a technically advanced environment and outstanding career opportunities with a growing company, recently named one of Oregon's top 100 employers. Our current open positions are:

Project Supervisor (2 positions)
Data Analyst
Technical Specialist
Process Analyst
Software Developer
Electronic Commerce Administrator

Resumes may be sent to B. Lyman, Standard Insurance Company, Human Resources, P.O. Box 7096, Portland, OR 97207. For further information on these positions, call (503) 236-5784.

STANDARD INSURANCE COMPANY
People. Not just policies.

WHERE SCIENCE MEETS ART.

PHAMIS Inc. is a leader in the development of healthcare information systems. Our corporate offices are located in downtown Seattle and we are looking for visionary creative professionals to join our growing team.

SENIOR SOFTWARE ENGINEER

Requires a BA/BS degree in Computer Science and 5+ years product development experience emphasizing C++, Windows/Win95, MFC/SDK. Experience with structured methodologies is essential. Must have strong leadership and problem-solving abilities. Familiarity with object-oriented environment highly desirable.

DATABASE ANALYST

Requires 5+ years information technology experience, including 3 years in database analysis or related field. BA/BS degree in CS is highly desirable. Familiarity with Tandem NonStop SQL & Enscribe a plus. Experience in training, consulting, analysis or applications development is required, as is planning, engineering, directing and controlling application development projects. Managing business requirement analysis with clients and coordinating the development of efficient, effective applications solutions is essential.

Sr. Business Analyst

Requires a Bachelor's degree in Computer Science, Business, or equivalent experience. Experience in training, consulting, analysis or applications development is required, as is planning, engineering, directing and controlling application development projects. Managing business requirement analysis with clients and coordinating the development of efficient, effective applications solutions is essential.

Sr. Systems Analyst

Requires a Bachelor's degree in Mathematics or related experience. Knowledge of internet based tools and systems, including World Wide Web, FTP and email, is a must. Experience in technical support, development, and network administration is essential. Experience supporting large, complex LAN networks. Desirable applications including MS Access, MS Excel and Visual Basic are important.

L/Av Sr. LAN Analyst

Requires a Bachelor's degree in Electronics, CS or equivalent and 3-5 years' work related experience supporting large, complex LAN networks. Banyan Vines NOS preferred. Good network design and implementation skills. Experience with Strong ISO/OSI knowledge and LAN technology, LAN operations, PCs and project management are also required.

ORACLE & ORACLE Financial DBAs

Requires a Bachelor's degree in Computer Science, Business, or equivalent experience. 5 years' experience in training, consulting, analysis or applications development is required, as is planning, engineering, directing and controlling application development projects. Managing business requirement analysis with clients and coordinating the development of efficient, effective applications solutions is essential.

Sr. Systems Analyst

Requires a Bachelor's degree and 5+ years' experience including consulting and project management experiences. Desirable applications including MS Access, MS Excel and Visual Basic are important.

L/Av Sr. LAN Analyst

Requires a Bachelor's degree in Electronics, CS or equivalent and 3-5 years' work related experience supporting large, complex LAN networks. Banyan Vines NOS preferred. Good network design and implementation skills. Experience with Strong ISO/OSI knowledge and LAN technology, LAN operations, PCs and project management are also required.

PET TECHNICAL SCHOLAR

Requires 5+ years' experience in training, consulting, analysis or applications development is required, as is planning, engineering, directing and controlling application development projects. Managing business requirement analysis with clients and coordinating the development of efficient, effective applications solutions is essential.

Sr. Business Analyst

Requires a Bachelor's degree in Computer Science, Business, or equivalent experience. 5 years' experience in training, consulting, analysis or applications development is required, as is planning, engineering, directing and controlling application development projects. Managing business requirement analysis with clients and coordinating the development of efficient, effective applications solutions is essential.

Sr. Systems Analyst

Requires a Bachelor's degree in Electronics, CS or equivalent and 3-5 years' work related experience supporting large, complex LAN networks. Banyan Vines NOS preferred. Good network design and implementation skills. Experience with Strong ISO/OSI knowledge and LAN technology, LAN operations, PCs and project management are also required.

ORACLE & ORACLE Financial DBAs

Requires a Bachelor's degree in Computer Science, Business, or equivalent experience. 5 years' experience in training, consulting, analysis or applications development is required, as is planning, engineering, directing and controlling application development projects. Managing business requirement analysis with clients and coordinating the development of efficient, effective applications solutions is essential.
**GET CONNECTED!**

Wall Data Incorporated develops, markets and supports Windows®, Windows NT™, Windows 95, OS/2® and Macintosh-based connectivity and application software products designed to increase productivity for the business user.

- We currently have openings in Seattle, Kirkland, Bellevue and Bellingham WA, as well as Westboro, MA.
- Product Development Manager - 3+ years managing SW dev. teams Windows development, Network SW products exp.
- Product Developer - OLE/COM/Active X, TCP/IP, Win32, JAVA
- Open Systems Developer - Unix/VAX/HP-host dev., C++, LAT, Pathworks, TCP/IP. Kenmit, X/Y/Z modem
- Software Test Engineer - MS Test, QA Partner, VB.
- Tech. Support - 2+ yrs. troubleshooting, host and/or AS/400 and DOS/Windows
- Publishing Engineer - VSIO, Microsoft OFFICE, software publishing background
- Corporate Systems Engineer - 2+ yrs. technical field account management, Spanish fluency
- Technical Writer - WinHelp, database exp., Word 6.0, Framemaker, Acrobat PDF, HTML

Please forward your resume/salary requirements, with indication as to which position you are applying for to: Recruiter, Wall Data Inc., 11332 NE 122nd Way, Kirkland, WA 98034-6931. FAX (206) 814-4353. Trademarks are registered to their respective companies. Email: hireme@walldata.com

Visit our website at: http://www.walldata.com

**Computer People**

**Plug into Nature, Too.**

You live and breathe technology, but you also appreciate the beauty of majestic mountains, forests, sparkling lakes and rushing rivers. If so, the deal is for you with Computer People Inc. in Portland, Oregon. Portland is clean, safe, and friendly city, conveniently located within a short drive of many outdoor venues, including the Pacific Ocean, Mt. Hood, and the Columbia River Gorge. In addition, Portland is a very active technology market, abundant with opportunities for IS professionals. Computer People Inc. is a $275 million international consulting firm with 14 offices in the US. Our branch in Portland is the largest of our domestic offices, and the vendor of choice for many of the largest clients in our market.

Currently, we have positions available for full-time or hourly consultants with these skill sets:

- **Oracle, Forms, C, Unix**
- **Development/Developer 2000**
- **Visual Basic, Access**
- **Powerbuilder**
- **Windows, C++, Visual C++**
- **Sybase, ROL Server or Informix**

At Computer People, we offer competitive salaries, paid overtime, great benefits and exceptional bonus programs. Find out more about our special style by contacting Computer People Inc. at:

**Computer People Inc.**

707 SW Washington St., Suite 510
Portland, OR 97205
1-800-274-2707 (503) 224-6070 or Fax: (503) 223-1204
email: recruiting@cppeople.com

**Waggener Edstrom**

Executive Systems Group, a leading provider of I.T. consulting services has immediate openings in the Northern California area for Top Quality Consultants in the following areas:

- **SAP R/3 BASIS and ABAP/4**
- **C/UNIX TESTERS**
- **VISUAL BASIC**
- **UNIX SYS/ADMIN**
- **LOTUS NOTES**
- **ORACLE DBA's and DEVELOPERS**
- **ADVISORS**
- **C/C++ and UNIX**
- **COBOL, DB2**
- **PEOPLESOFT**
- **HTML/JAVA**
- **LAN/WAN**
- **PROJECT MANAGERS**

Join Waggener Edstrom, the Northwest’s largest & fastest growing public relations agency with technology, science & consumer-based clients, including Corbis Corporation, AT&T Wireless Services, Microsoft, SAP, Starwave & Visa. With offices in Portland, Seattle & the Silicon Valley positions are available for working in this dynamic & fast paced team environment providing the highest quality public relations strategic counsel & services. Our clients are technology based, with an emphasis on e-commerce, platform tools, business-to-business technology, client/server applications, consumer hardware architecture, multimedia and broadband networking, & enterprise computing. You will manage long-term relationships with industry analysts, & business & trade press &/or consumer media leaders.

Requirements include:
- * Previous responsibility converting information about technologically driven products & processes to the business & consumer press.
- * Developed media relations in business & trade press.
- * Strategic counsel & creative media writing.

Excellent working environment, compensation & benefits! Send resume, cover letter & salary history to: Susan Holley, Waggener Edstrom, 222 SW Fifth Avenue, Suite 1100, Portland, OR 97204 fax: (503) 224-4707 email: susanh@waggener.com

**Wall Data Incorporated** develops, markets and supports Windows®, Windows NT™, Windows 95, OS/2® and Macintosh-based connectivity and application software products designed to increase productivity for the business user.

Wall Data Incorporated develops, markets and supports Windows®, Windows NT™, Windows 95, OS/2® and Macintosh-based connectivity and application software products designed to increase productivity for the business user.

Wall Data Incorporated develops, markets and supports Windows®, Windows NT™, Windows 95, OS/2® and Macintosh-based connectivity and application software products designed to increase productivity for the business user.

Wall Data Incorporated develops, markets and supports Windows®, Windows NT™, Windows 95, OS/2® and Macintosh-based connectivity and application software products designed to increase productivity for the business user.
R. PROFESSIONAL CONSULTANT

Working with computer-automated business systems. As a self-contained division of a corporate unit, we continue to grow at a tremendous pace and currently seek

QUALIFIED CANDIDATES

Qualified candidates should possess a Bachelor's degree in Computer Science and 3 years of programming experience, along with excellent interpersonal skills and programming capability.

Qualified candidates should also have experience in the following areas:

- Design and implementation of complex software systems
- Experience with database management systems (DBMS)
- Proficiency in programming languages such as C, C++, and Java

Salary Range: $45,000 - $55,000 per year

Send resume to: Paul Lowrance, Compuware Corporation, 1001 West Elizabeth Street, Suite 200, Warren, MI 48093. Reference Job # CPE200.

R. SOFTWARE DEVELOPER - UNIX

We are looking for someone who can take Windows/NT/OS products and develop them to UNIX 9.1 environment. Substance Solid System Administration experience is required. This will involve preparing data test, programming and debugging, 3-5 years experience required, including 1 year in designing and coding server applications.

Achomplish something astonishing and enjoy a strong career growth potential. If you are interested, please submit your resume, indicating position desired, to Pitney Bowes Software Systems, Attn: Leslie G. Rittenhouse, 4130 Commerce Court, Suite 305, Charlotte, NC 28217. Fax 704-597-5984. Equal Opportunity Employer M/F/D/V.

Pitney Bowes Software Systems

Programmer Analyst (2 openings) - Plan, develop, test & document computer programs, applications, systems & processes; coordinate user interface requirements; document software systems; develop systems feasibility studies & cost & time required, and training programs. Experience in related applications required. Regulations governing computer programs; applying knowledge of computer system applications. Qualification: Bachelor's degree in Computer Science.

R. SOFTWARE DEVELOPER - Windows

The full-time position will involve developing software for complex computer systems running AS/400, including analysis of overall system user requirements, request for proposal preparation & evaluation of client systems. Must include experience performing technical design & programming of applications using programming languages: C, C++, VB, COBOL, and SQL. Experience in related applications required. Requirements: 10+ years of experience, or 8+ years with a Senior Consultant Required. Salary: $65,000 - $75,000 per year.

Send 2 copies of both resume and cover letter to Illinois Department of Employment Security, 405 South State Street, Suite 3, Chicago, Illinois 60606. Attention:ekt, Reference Number V-IL-150205-0. NO CALLS. AN EMPLOYER PAID AD.

Consultant, Customized Computer Systems. Analyst/Designer to design & implement computer systems required to achieve objectives of corporate operations; access data from multiple sources and databases. Experience in related applications required. Experience in related applications required. Requirements: Bachelor's degree in Computer Science. Salary: $42,940/yr., 40 hours/wk. Must have proof of legal authority to work in the United States. Send resume to 7310 Woodward Avenue, Detroit, Michigan 48202. Reference #200.

Soft Engineer assigned as professional with software & systems engineering capabilities. Design, develop & implement software for complex computer systems running AS/400, including analysis of overall system user requirements, request for proposal preparation & evaluation of client systems. Must include experience performing technical design & programming of applications using C, C++, VSAM, FOXPRO, LAN, UNIX & C; & experience in related applications. Requirements: Bachelor's degree in Computer Science. Salary: $40,000/yr., 40 hours/wk. Must have proof of legal authority to work in the United States. Send resume to 7310 Woodward Avenue, Detroit, Michigan 48202. Reference #200.

Programmer Analyst to design, develop, test & document computer programs, applications, knowing project management techniques & computer systems. Design & implement computer systems using applications such as: C, C++, VSAM, FOXPRO, LAN, UNIX & C; & express in related applications. Requirements: Bachelor's degree in Computer Science. Salary: $40,000/yr., 40 hours/wk. Must have proof of legal authority to work in the United States. Send resume to 7310 Woodward Avenue, Detroit, Michigan 48202. Reference #200.

Analyzing systems to design & develop software for complex computer systems running AS/400, including analysis of overall system user requirements, request for proposal preparation & evaluation of client systems. Must include experience performing technical design & programming of applications using C, C++, VSAM, FOXPRO, LAN, UNIX & C; & experience in related applications. Requirements: Bachelor's degree in Computer Science. Salary: $40,000/yr., 40 hours/wk. Must have proof of legal authority to work in the United States. Send resume to 7310 Woodward Avenue, Detroit, Michigan 48202. Reference #200.

SOURCE SOFTWARE SYSTEMS

 geometry, cost & time required, compatibility & feasibility studies & determination of design; design; development of software development & related activities. Experience in related applications required. Requirements: Bachelor's degree in Computer Science. Salary: $42,940/yr., 40 hours/wk. Must have proof of legal authority to work in the United States. Send resume to 7310 Woodward Avenue, Detroit, Michigan 48202. Reference #200.

We are looking for someone who can take Windows/NT/OS products and develop them to UNIX 9.1 environment. Substance Solid System Administration experience is required. This will involve preparing data test, programming and debugging, 3-5 years experience required, including 1 year in designing and coding server applications.

Achomplish something astonishing and enjoy a strong career growth potential. If you are interested, please submit your resume, indicating position desired, to Pitney Bowes Software Systems, Attn: Leslie G. Rittenhouse, 4130 Commerce Court, Suite 305, Charlotte, NC 28217. Fax 704-597-5984. Equal Opportunity Employer M/F/D/V.

Pitney Bowes Software Systems

Programmer Analyst (2 openings) - Plan, develop, test & document computer programs, applications, systems & processes; coordinate user interface requirements; document software systems; develop systems feasibility studies & cost & time required, and training programs. Experience in related applications required. Regulations governing computer programs; applying knowledge of computer system applications. Qualification: Bachelor's degree in Computer Science.

R. SOFTWARE DEVELOPER - UNIX

We are looking for someone who can take Windows/NT/OS products and develop them to UNIX 9.1 environment. Substance Solid System Administration experience is required. This will involve preparing data test, programming and debugging, 3-5 years experience required, including 1 year in designing and coding server applications.

Achomplish something astonishing and enjoy a strong career growth potential. If you are interested, please submit your resume, indicating position desired, to Pitney Bowes Software Systems, Attn: Leslie G. Rittenhouse, 4130 Commerce Court, Suite 305, Charlotte, NC 28217. Fax 704-597-5984. Equal Opportunity Employer M/F/D/V.

Pitney Bowes Software Systems

Programmer Analyst (2 openings) - Plan, develop, test & document computer programs, applications, systems & processes; coordinate user interface requirements; document software systems; develop systems feasibility studies & cost & time required, and training programs. Experience in related applications required. Regulations governing computer programs; applying knowledge of computer system applications. Qualification: Bachelor's degree in Computer Science.
Generally speaking, there's one place where you'll find all the elements for personal growth and professional success. American General Finance.

As one of America's largest providers of consumer lending and credit related services, American General Finance can connect you with a variety of high tech career opportunities. We're currently seeking people with diverse backgrounds and skills to join the team at our Evansville, Indiana headquarters. In general, you won't find a better environment for your success.

AS/400 Opportunities

American General Finance has a nationwide network of distributed AS/400 processors communicating with an MVS/ESA based IBM mainframe. The network includes approximately 1200 AS/400 systems. We currently have the following positions available:

Project Manager

Qualifications include a Bachelor's degree with 7-10 years related work experience. Must also be experienced with large WAB-based distributed processing systems implemented on the IBM AS/400.

Senior Systems Administrator

Qualifications include a four year degree or equivalent experience as well as a minimum of 6 years system administration experience. Extensive experience with networked systems is also required. Proficiency in at least two programming languages (CL, COBOL, C, or REXX) is preferred.

Project Analyst

Requires a college degree, 5 years of COBOL experience and 4 years design experience. AS/400 experience is strongly preferred. Knowledge of APPC/APPN is desirable.

Programmer/Analyst

Requires a college degree or equivalent with a minimum of two years of COBOL programming experience. AS/400 experience is strongly preferred.

Mainframe Programming Opportunities

Working on an IBM mainframe, our programmers provide the systems which link the company's national branch network. Our environment also includes MVS/ESA and CICS. Responsibilities will include analysis, coding and testing of new and existing application programs.

Project Analyst

Requires a Bachelor's degree or equivalent and eight years in programming and analysis in a COBOL IBM mainframe environment.

System Analyst

Requires a Bachelor's degree with 5 years programming and analysis experience. Also working knowledge of COBOL and Assembler languages in an MVS environment. Knowledge of retail store systems and operations is a plus.

Programmer/Analyst

Requires 5 years of programming and analysis and a working knowledge of COBOL. A Bachelor's degree or equivalent experience is also required.

Other Career Opportunities

Technical Support Analyst

Responsible for facilitating automation of testing by using automated testing tools on midrange systems applications and mainframe systems applications to improve efficiencies of testing. Will also create, recommend purchases, implement, administer and train all personnel in ISS and provide technical support toAcceptance Test.

Requires a four-year degree or equivalent experience with 8 years programming experience. AS/400 CL coding and 3270 and 5290 terminal emulation experience are also required. Must have experience with developing, installing and maintaining of automated testing tools.

Programmer/Analyst

Will produce C and C++ programs written to run under DOS, Windows, and Windows NT in support of retail systems.

Requires a Bachelor's degree or equivalent with two years of C or C++ programming in a PC-DOS environment. MS Windows/Windows NT preferred.

Associate Director, Information Center

Will be responsible for planning, directing, and coordinating all activities involving LAN, Workstation, and Quality Assurance Support. In addition, you will develop the decision support and data administration functions. Requires a BS degree in Computer Science or other related program or equivalent experience, five to ten years of data processing experience, must have two years of management experience and knowledge of all Information Center functions and objectives.

Data Communications Systems Programmer

Responsibilities include the daily support of a VSAT based SNA network which provides processing facilities over up to 1200 AS/400s communicating with a 9125-752 CPU. Will also participate in the design and implementation of networking solutions which will provide communication links to outside vendors and business partners. Requires a college degree or equivalent and five years experience in a mainframe based communications environment. Also knowledge of communications protocols and architectures and experience in the installation and use of communication software (VTAM, NCP, NETVIEW). Familiarity with data transfer software such as NETVIEW DM and CONNECT DIRECT are also required.

CTI Applications Programmer

Will analyze Computer/Telephony Integration (CTI) applications, proposed projects and design and recommend CTI solutions to business needs requiring CTI applications. You will also prepare specifications for implementation plans for CTI and coordinate installation of computer and telephone hardware and software. Requirements include a college degree or equivalent and four years experience in telecommunication and computer support. You should also have good working knowledge of voice and data technology including PBX's, AS/400s, PCs and LANs.

Electronic Commerce Specialist

Will be responsible for the design and support of American General Finance's entrance in the field of Electronic Commerce. This includes heavy involvement in the area of electronic information exchange (e.g., electronic data interchange, internet/intranet) and will be responsible for overseeing and administering the implementation of electronic mail (edent) and Lotus Notes and associated applications. Requires a four year degree or equivalent with three years of PC/LAN based programming experience and four years analysis experience. Creativity in designing and implementing solutions to business problems are also required.

Senior Computer Operator

Will handle the daily functions of a large MVS mainframe system supporting 1200+ distributed AS/400 network. Responsibilities include ensuring maximum system availability, successfully completing day-to-day system processing and problem determination/resolution.

Requires one year of college and a minimum of three years data processing experience. Must be competent in all phases of the MVS/ESA operating system, JCL, job scheduling and able to make decisions on priorities. Experience in console automation, REXX programming, performance monitoring, storage management and/or disaster recovery is a plus.

We offer tuition reimbursement, extensive relocation assistance, training, advancement potential and an atmosphere that encourages creative thinking. For consideration, please forward your resume and salary requirements to American General Finance, P.O. Box 59, Evansville, IN 47701-0059 or fax to (812) 468-5119.

Attn: CW/HQ84

American General Finance

American General Finance

We are an equal opportunity employer.
Monday, September 16, 1996
Fairview Park Marriott, Falls Church, Virginia

On September 16, 1996, you have a special opportunity to update your recruiting skills and network with recruiters in your area at the first-ever Washington, D.C. area Corporate Technical Recruiting Conference, held at the Fairview Park Marriott, Falls Church, Virginia.

A Full Schedule of Contemporary Topics

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:30am</td>
<td>Continental Breakfast &amp; Conference Registration</td>
</tr>
<tr>
<td></td>
<td>Concurrent Sessions:</td>
</tr>
<tr>
<td></td>
<td>How to Pick the Right People</td>
</tr>
<tr>
<td></td>
<td>Dr. William Swan, President, Swan Consulting</td>
</tr>
<tr>
<td></td>
<td>Soft Skills and the &quot;Invisible Assembly Line&quot;</td>
</tr>
<tr>
<td></td>
<td>Tony Barrile, President, Barrile &amp; Associates</td>
</tr>
<tr>
<td></td>
<td>How the Techno MBA Fits into the Business Solution</td>
</tr>
<tr>
<td></td>
<td>Joan B. Craig, Director, Placement &amp; Career Svcs., U. of Pittsburgh</td>
</tr>
<tr>
<td>12:15pm</td>
<td>Luncheon Keynote: Industry Trends</td>
</tr>
<tr>
<td></td>
<td>Maryfran Johnson, Executive Editor, Computerworld</td>
</tr>
<tr>
<td></td>
<td>Repeat of Concurrent Sessions</td>
</tr>
<tr>
<td></td>
<td>Town Hall Forum</td>
</tr>
<tr>
<td></td>
<td>Gary Cluff, President, Cluff and Associates</td>
</tr>
<tr>
<td>6:00pm</td>
<td>Program ends</td>
</tr>
</tbody>
</table>

Selected sessions include:

**Proactive Recruitment Techniques**
Dave Drugman, President, Bay Cities Research, Inc.
To remain competitive, today's technical recruiters need to be aware of the latest trends in sourcing and proactive recruiting. This in-depth session from a leading expert will explore this critical topic and will help you put your resources and expectations into proper perspective.

**Industry Trends**
Luncheon/Keynote Address
Maryfran Johnson, Executive Editor, Computerworld
Sure, there are new skills entering the market every day, but what are the trends that drive these skills? Maryfran Johnson, one of the industry's leading watchers of the Information Systems profession will give you an up-to-the-minute view in this very special keynote address.

**Town Hall Forum**
Gary Cluff, President, Cluff and Associates
In this session, you'll not only be able to propose your specific questions for open discussion, you'll learn of real world issues and solutions from your peers. You won't want to miss this rare opportunity as Gary Cluff, an expert in the HR field, leads us through this modern discussion of your recruiting topics.

For more information, call the conference hotline: 1-800-488-9204
FourGen Software is a leading provider of high-volume integrated enterprise distribution software designed to help its clients win and keep customers and key suppliers profitably.

FourGen is currently hiring professional consultants to install and customize our client/server Supply Chain Management software, including Distribution and Financial applications. Excellent compensation package includes salary, bonuses, and benefits. 80% travel required.

**INFORMIX-4G CASE Consultants**

Minimum of 2 years INFORMIX-4GL and/or Informix CASE programming experience in a UNIX environment required. Distribution and/or Financial application experience highly desirable. Data conversion, Informix tuning, and UNIX systems administration experience helpful. (Ref#: PSG 4GL)

**Distribution/Financial Application Consultants**

Minimum of 3 years business experience in either Distribution or Finance. Minimum of 2 years MIS experience, including managing the implementation of Distribution and/or Financial applications. Project management, business process redesign, system design specification, and systems training experience required. Relational database, client/server development, and UNIX experience highly desirable. (Ref#: PSG DF)

FourGen Software, an equal opportunity employer, is headquartered in Seattle, Washington.

Send resumes indicating salary requirements and location preferences to:

FourGen Software, Inc.
115 NE 100th Street, Seattle, WA 98125-8098.

E-mail: hi@fourgen.com
Fax: 206-522-0035
Technology Consulting, Inc. is a leading national provider of information technology services. If you have at least two years of experience and any combination of the skills listed below, as well as excellent business acumen and exceptional technical knowledge, focus your career search on TCI.

We need highly motivated & career oriented consultants with
+ CICS/COBOL
+ C/C++
+ Client/Server, Mainframe, Mini, Micros, DB2, SQL DB, ORACLE, SAA, Internet, UNIX, TCP/IP, Windows, Adix, 
+ Navis, Virtex, SQL, ODBC, OLE, OPEN DBMS, Dbase, 
+ Software Distribution, RMM, RTOS, VAX, Distributed, 
+ PCs, WORKGROUP, Client/Server, MVS, IBM 370/434, 
+ HTML, XML, JAVA, NT, SQL, SQL, ORACLE, LOB, 
+ COBOL, CICS, IMS, DB2C, PL/I, FOCUS, MIFOCUSS, 
+ COBOL, EDI, UNIX, AIX, TCP/IP, WINDOWS NT, 
+ Knowledgeable AMD.

TCI offers competitive salaries, attractive benefits, and relocation assistance. For consideration, send resume or call:

800-829-4284.

Technology Consulting, Inc., 214-691-3420

DICE is looking for Data Processing, Engineering Technicians. As a Data Processing Engineer, you will analyze system problems, design computer-based methodologies, implement, install and maintain software and hardware, and manage the life cycle of software development and implementation projects. At least a college degree in Computer Science or Engineering, or a combination of related education and experience, is required. 40 hrs/wk, 8a-5p. Send resume to 7310 Woodward Ave., Detroit, MI 48221.

DICE is a FREE online job search service, providing Technology Consulting, Inc. is a leading national provider of fulltime positions across the USA. Please contact the

This content is a natural representation of the text in the image.
We're GrowingFlorida Opportunities

We at ProSource Distribution Services, the largest specialty food service distributor in the world, are currently experiencing unparalleled growth due to consolidation of our Coral Cables support center. This consolidation has created multiple opportunities in our MIS Department for team-oriented professionals at all levels with the ability to work in a fast-paced, multi-platform environment.

WE'RE HIRING PERMANENT MIS PROFESSIONALS

Programmer/Analysts

AS/400 - RPG and CL, OS/400 and Unix, EDI and CA/400 plus

VM - COBOL, FOCUS, DOS VSE, CICS, VSAM, VM/CMS plus

VAX - VMS, C, C++, R4M, RDB and other

CONTRACTORS

ALL TECHNICAL SKILLS

Nationwide Requirements

We mail your resume to brokers nationwide at no cost to you. Send your resume to:

J.KL Enterprises, Inc.
500 North College, Suite 108
Ft. Lauderdale, FL 33309

or

14135 W Street NW, First Floor
Washington, DC 20008

1-800-357-9585
Fax 1-800-468-6701

We're committed to providing equal opportunity for all qualified applicants. We are an equal opportunity employer and do not discriminate on the basis of race, sex, color, age, religion, national origin, or military status.

Systems Engineer

We at ProSource Distribution Services, the largest specialty food service distributor in the world, are currently experiencing unparalleled growth due to consolidation of our Coral Cables support center. This consolidation has created multiple opportunities in our MIS Department for team-oriented professionals at all levels with the ability to work in a fast-paced, multi-platform environment.

CONTRACTORS

ALL TECHNICAL SKILLS

Nationwide Requirements

We mail your resume to brokers nationwide at no cost to you. Send your resume to:

J.KL Enterprises, Inc.
500 North College, Suite 108
Ft. Lauderdale, FL 33309

or

14135 W Street NW, First Floor
Washington, DC 20008

1-800-357-9585
Fax 1-800-468-6701

We're committed to providing equal opportunity for all qualified applicants. We are an equal opportunity employer and do not discriminate on the basis of race, sex, color, age, religion, national origin, or military status.

Copyright 1996, Computerworld
Our Clients are really paying for RESPONSE TIME, Inc.

CONTRACTORS

Please e-mail/send/fax resume to either our Florida or TX, MO, IN, CT, NE, et al

Phone (561) 477-1882

Salaries to 110K+ Bonus

VA, NC, UT, FL

PROGRAMMERS MVS, DB2, VTAM, MONITORING CICS, ALC, INTERNALS

in ORACLE DBAdmin; ¥ SYBASE DEVELOPER & DBA

¥ C/UNIX TESTERS

RENO, NV 89502

visit our web site at http://www.iadd.com/vistech.

Suite 200, Chantilly, VA 22021. E-mail: vistech@pop.dn.net or

¥ POWERBUILDER & ORACLE

P.O. Box 890723, Houston, TX, 77289-0723

JasTeck of Florida

1125 Bel Air Dr.
North Palm Beach, FL 33408

Phone (561) 477-1882

Fax (561) 876-2068

e-mail: mertz@pop.gate.net

Computerworld's Washington, D.C. Corporate Technical Recruitment Conference

Monday, September 16, 1996
Fairview Marriott Park, Falls Church, Virginia

On September 16, 1996, you have a special opportunity to update your recruiting skills and network with recruiters in your area at the first-ever Washington, D.C. area Corporate Technical Recruiting Conference, held at the Fairview Marriott Park, Falls Church, Virginia.

A Full Schedule of Contemporaneous Events

7:30am Continental Breakfast & Conference Registration

Concurrent Sessions:

How to Pick the Right People

Dr. William Smol, President, Scan Consulting

Soft Skills and the "Invisible Assembly Line"

Tony Barile, President, Barile & Associates

How the Techno MBA Fits into the Business Solution

John G. dir., Director, Placement & Career Services, University of Pittsburgh

Proactive Recruitment Techniques

Dave Dragun, President, Bay Cities Research, Inc.

To remain competitive, today's technical recruiters need to be aware of the latest trends in sourcing and proactive recruiting. This in-depth session from a leading expert will explore this critical topic and will help you put your resources and expectations into proper perspective.

Luncheon/Keynote Address: Industry Trends

Maryfran Johnson, Executive Editor, Computerworld

Computerworld is proud to offer you this exclusive opportunity to hear from these top recruiters. The information they will share is invaluable to the professional recruiters who attend these events.

Luncheon/Keynote Address:

Monday, September 16, 1996
Fairview Marriott Park, Falls Church, Virginia

On September 16, 1996, you have a special opportunity to update your recruiting skills and network with recruiters in your area at the first-ever Washington, D.C. area Corporate Technical Recruiting Conference, held at the Fairview Marriott Park, Falls Church, Virginia.

A Full Schedule of Contemporaneous Events

7:30am Continental Breakfast & Conference Registration

Concurrent Sessions:

How to Pick the Right People

Dr. William Smol, President, Scan Consulting

Soft Skills and the "Invisible Assembly Line"

Tony Barile, President, Barile & Associates

How the Techno MBA Fits into the Business Solution

John G. dir., Director, Placement & Career Services, University of Pittsburgh

Proactive Recruitment Techniques

Dave Dragun, President, Bay Cities Research, Inc.
LAN TAPE BACKUP CONTINUES TO BE A WHOPPING ADMINISTRATIVE HASSLE FOR MOST INFORMATION SYSTEMS MANAGERS, WHO FIND THAT RETRIEVAL OF LOST DATA CAN BE TIME-CONSUMING.

"It's a huge administrative task," says Michael Peterson, an analyst at Strategic Research Corp., a network storage management market research firm in Santa Barbara, Calif. "The number of errors in the backup process averages two a week. When errors occur, you need manual intervention to solve them. Tapes have to be changed daily, labeled and rotated. And somebody must manage the media."

Rob Enderle, a senior industry analyst at Giga Information Group in Santa Clara, Calif., defines the LAN tape storage market as including any LAN server that is backed up to a local tape drive, although some servers are backed up to centralized tape libraries or servers. Major players in the LAN tape drive market include Hewlett-Packard Co., Storage Technology Corp., Seagate Technology, Inc. and Exabyte Corp.

Ed Graef found out what a big administrative task LAN tape backup can be. "The speed of backup is largely transparent to users when the system is backed up," says Graef, IS manager at Colorado Medtech Corp., a medical devices firm in Boulder, Colo., that does contract manufacturing and research and development. "But when something has to be restored, then the clock starts, and they've got to have it right now."

The problem is that tape backup doesn't always permit file restoration. For example, Graef's 150-employee firm favors a traditional backup scenario: Using three tape drives from Boulder-based Exabyte, IS performs incremental daily backups of only those files that have changed and does a full system backup weekly.

"When someone comes to me and wants a file restored, he or she often isn't sure when the file was last changed," Graef says. "That increases the amount of time it takes to restore the file because we must first look for the file backup on the most recent tape. And if it's not there because the file didn't change that day, we have to go back to the previous tape."

Graef backs up about 10G bytes of data nightly over a period of two to three hours. In addition to transferring data to tape, the IS staff spends about three hours per week switching tapes and restoring lost files for users. About once a month, tapes are moved off-site for disaster recovery backup.

"Errors in the backup process average two a week."

— Michael Peterson, analyst

This emphasis on recovery efficiency puts pressure on IS managers, Peterson says. "If you ask network administrators what is the biggest problem of managing storage, tape backup is always the No. 1 or No. 2 problem. And the backup problem falls into two camps: People who have large databases have a difficult time getting good backups in the time window they have available. And people who pay a lot of attention to backup suffer the ongoing grief of high labor costs. Administering the backup process in a large distributed network can cost $30,000 to $50,000 a year in labor cost."

"But bandwidth limitations on the LAN restrict centralized backup. As a result, tape drive industry sales aren't expected to slow until the early 2000s and begin a gradual decline," says Michael Peterson, an analyst at Strategic Research. "But it's still a nicely growing market now."

— Steve Alexander

Help is on the way

To cope with the administrative burden of tape backup, analysts say, the industry is shifting to new techniques and products, including the following:

• Image backup, in which disks are copied at the block level rather than the file level. This is expected to make backup five to 10 times faster.

• Autocchanger tape drives, which automatically change tapes from one day to the next without human intervention and thus cut labor costs. They are available today but cost about twice as much as conventional drives.

• File mirroring of servers to a central disk drive, which is then backed up to tape. This is expected to reduce the number of tape drives needed in a distributed network. Today, tape drives typically are attached to many individual servers throughout the network. But bandwidth limitations on the LAN restrict centralized backup. As a result, tape drive industry sales aren't expected to slow until after the turn of the century.

"The product life cycle of LAN tape storage will plateau in the early 2000s and begin a gradual decline," says Michael Peterson, an analyst at Strategic Research. "But it's still a nicely growing market now."

— Steve Alexander
Go Direct For Great Presentations

Up to 4 Users Can Access Multiple PC, Macintosh, and Sun Computers from a Central Location!

Multiplatform
Supports any combination of PC, Macintosh, and Sun computers. Use any platform's peripherals to access any type of computer in the system.

Multiuser
Up to 4 users can access different computers simultaneously!

Multimedia
Every user has full multimedia capabilities; keyboard, mouse, video, microphone, speakers, and serial support available.

DATA INTERCHANGE and BACKUP SOLUTIONS SPECIALISTS

- HP
- SGI
- MAC
- AS400
- RS6000
- NETWARE

QUALITY PERFORMANCE VALUE

1-800-468-0680 FAX: (818) 592-0116 
www.qualstar.com TEL: (818) 592-0061

Qualstar, Inc.
470 East Paces Ferry Road
Atlanta, GA 30305

GET HELP!
Mainframe AS/400 Client/Server
- Data Center Facilities
- Remote Support
- Networking
- Desktop
- Technical Assistance
- Internet

Amquest, Inc.
470 East Paces Ferry Road
Atlanta, GA 30305

YOUR PARTNER IN MANAGING INFORMATION TECHNOLOGY
The United States and IBM have agreed to modify the Final Judgment to establish specific sunset periods for all remaining substantive provisions of the Final Judgment. The parties agreed to terminate Sections V (b) and (c), which required IBM to offer to sell at no more than specified prices and to hold for a specified period used IBM machines that IBM acquired pursuant to trade-in or as a credit against an IBM machine for sale or trade-in, and Section VIII, which specified conditions under which IBM could purchase computers from the U.S. government. The Court, on January 17, 1996, terminated certain provisions of the Final Judgment in their entirety: (a) Sections V (b) and (c), which required IBM to offer to sell at no more than specified prices and to hold for a specified period used IBM machines that IBM acquired pursuant to trade-in or as a credit against an IBM machine for sale or trade-in; (b) Section VIII, which specified conditions under which IBM could purchase computers from the U.S. government; and (c) all other provisions of the Final Judgment as they applied to all IBM computer products and services, except as they applied to the AS/400 and System/360, System/370, and System/390 families of products and services. The Court, on January 17, 1996, terminated certain portions of the Final Judgment in their entirety: (a) Sections V (b) and (c), which required IBM to offer to sell at no more than specified prices and to hold for a specified period used IBM machines that IBM acquired pursuant to trade-in or as a credit against an IBM machine for sale or trade-in; (b) Section VIII, which specified conditions under which IBM could purchase computers from the U.S. government; and (c) all other provisions of the Final Judgment as they applied to all IBM computer products and services, except as they applied to the AS/400 and System/360, System/370, and System/390 families of products and services. The Court, on January 17, 1996, terminated certain portions of the Final Judgment in their entirety: (a) Sections V (b) and (c), which required IBM to offer to sell at no more than specified prices and to hold for a specified period used IBM machines that IBM acquired pursuant to trade-in or as a credit against an IBM machine for sale or trade-in; (b) Section VIII, which specified conditions under which IBM could purchase computers from the U.S. government; and (c) all other provisions of the Final Judgment as they applied to all IBM computer products and services, except as they applied to the AS/400 and System/360, System/370, and System/390 families of products and services.

The United States and IBM have agreed to modify the Final Judgment to establish specific sunset periods for all remaining substantive provisions of the Final Judgment. The parties agreed to terminate Sections V (b) and (c), which required IBM to offer to sell at no more than specified prices and to hold for a specified period used IBM machines that IBM acquired pursuant to trade-in or as a credit against an IBM machine for sale or trade-in; and Section VIII, which specified conditions under which IBM could purchase computers from the U.S. government. The Court, on January 17, 1996, terminated certain portions of the Final Judgment in their entirety: (a) Sections V (b) and (c), which required IBM to offer to sell at no more than specified prices and to hold for a specified period used IBM machines that IBM acquired pursuant to trade-in or as a credit against an IBM machine for sale or trade-in; (b) Section VIII, which specified conditions under which IBM could purchase computers from the U.S. government; and (c) all other provisions of the Final Judgment as they applied to all IBM computer products and services, except as they applied to the AS/400 and System/360, System/370, and System/390 families of products and services.
To have your Internet address listed here, please contact Paula Wright at (508) 229-7175


Your New Address Goes Here
Address shown: 4 Home Q Business

COMPUTERWORLD, P.O. Box 9171, Framingham, MA 01701-9171

For help in changing your subscription address, contact the COM-PU-LINE service at 1-800-669-1002 in the U.S., or 614-382-3322 outside the U.S. (9 a.m. to 5 p.m. EST).

Have a Problem With Your Computerworld Subscription?

We want to solve it to your complete satisfaction, and we want to do it fast.

Please write to:

Computerworld, 500 Old Connecticut Path, Framingham, MA 01701-9171.

Please include your complete mailing label in your correspondence.

Chairman of the Board, Patrick J. McGovern; President, Kelly Conlin; Chief Operating Officer, Jim Casella

An IDG Company: The World's Leader in Information Services on Information Technology
wo powerful trends — the burgeoning growth of corporate intranets and the blossoming interest in online investing — have financial management firms in a race to provide online 401(k) plans to America’s corporate benefits departments.

At least two mutual fund companies, Fidelity Investment Co. and The Vanguard Group of Investment Cos., are now beta-testing online services that can be customized for each employer’s plan. The services provide a general education on the principles of portfolio management and asset allocation, specific information on the employer’s 401(k) program and details on the particular investment options offered through the program.

The services also will allow participants to transfer funds online in order to rebalance their portfolios. The services are private in that they link to a server based at the mutual fund company. Access is granted only to 401(k) plan participants. However, the services use related World Wide Web sites, including the home pages of mutual fund companies.

The idea is attractive to employers that are using corporate intranets to save administrative time and expenses in disseminating information. Employees like the convenience of being able to access their accounts and change their asset allocation from an office or a home computer.

“The Internet is a tremendous tool to transmit benefits information,” says Frank Armo, vice president of electronic distribution services for the 401(k) group at Fidelity Investment in Boston. Fidelity, which is the top provider of 401(k) plans in the country, recently surveyed its customers and found that half of them had an intranet site that provided at least some benefits information.

Fidelity is now beta-testing a 401(k) service as part of its NetBenefits program, which provides retirement planning tools and other information via the Web. In addition to information and funds transfers, the service allows participants to change instructions for future contributions, Armo says.

For example, an employee may change his contribution, splitting it among four funds rather than just three. Changes made online are given a confirmation number, which is followed up by a paper confirmation in the mail.

Fidelity plans to roll out the service later this year.

Along with Fidelity funds, the NetBenefits program accommodates company stock and several non-Fidelity funds, including Franklin Templeton Group, Invesco, Janus, Neuberger & Berman, PIMCO, Strong, USAA and Warburg Pincus.

Educational tool
Another firm venturing into online is The Vanguard Group in Valley Forge, Pa. The company has been beta-testing Participant Online, an interactive 401(k) product built on Web technology. Compaq Computer Corp. has been using the system since last fall.

The program features an extensive educational section, including an interactive modeling capability that allows investors to figure out how much to save each month to meet their long-term goals.

Another company is working on providing an online service that isn’t specific to a particular mutual fund company. SSDS, Inc., a 10-year-old network integrator in Englewood, Colo., stumbled upon the idea of providing a turnkey service when it changed its own 401(k) program last fall.

“We realized that this would be a wonderful application for a Web service,” says Jerry Smith, 401(k) program manager at WebVestment Corp., a subsidiary SSDS created specifically for the service, called 401(k)Online.

The company is prototyping the program internally. It is also talking with investment firms about offering a turnkey service whereby the financial company would “private-label” the program as its own. SSDS would then tailor the program to fit the needs of the investment firm’s customers.

The company plans to have something in operation by the end of the year.

A differentiating feature of the 401(k) program is that it walks the user through a 20-question form to create a risk profile, which gets scored immediately, Smith says. Then it shows which funds match the user’s particular risk profile.

Another avenue for online 401(k) programs is Networth, a Web site that provides a wealth of information on mutual funds. The site’s operator, Galt Technologies, Inc., is reportedly working on specific plans to allow investors to transfer 401(k) holdings between funds.

Galt is in the process of being acquired by Intuit, Inc. David Krimm, director of marketing for investment services at Intuit, has said the company is looking into the 401(k) services it can offer on Networth.
Chips are down for Cyrix 286

Building a good product doesn’t necessarily lead to success in a market, particularly when that market is dominated by Intel.

Few companies know this better than Cyrix Corp. (Nasdaq: CYRX). The microprocessor developer in Richardson, Texas, has attempted to take on Intel Corp. (Nasdaq: INTC) with its 680x86 line of microprocessors.

The chips run faster than comparable Intel chips — with the exception of the Pentium Pro — according to several independent benchmark tests. And they are priced slightly lower.

Unfortunately, “while the products are good, they aren’t good enough,” says Drew Peck, an analyst at Cowen & Co. in Boston. Large PC manufacturers won’t risk using the Cyrix chips and “incurring the wrath of Intel.” Because Intel dominates the microprocessor industry with at least an 85% market share, it can use “subtle and not-so-subtle measures to lock in customers” and lock out competitors, Peck says. He has a neutral rating on Cyrix stock.

Analysts see more problems looming for Cyrix. The firm last year signed a manufacturing deal with IBM. Now it is overloaded with chips that few people are buying. What’s worse, the agreement calls for Cyrix to buy another 1.4 million units from IBM by the end of December. The resulting excess inventory and cash squeeze spells bleak times ahead for Cyrix, says David Wu, an analyst at The Chicago Corp. in New York. Wu says he will be “very surprised” if Cyrix is still an independent company in 1998. — Stewart Deck
J.D. Edwards is proud to introduce a remarkable new software architecture called Configurable Network Computing," or CNC. Available only in our OneWorld™ enterprise-wide software, CNC masks the complexities found in client/server systems, so you can focus on more important matters, like managing your business. Now you can dynamically configure and reconfigure everything from workflow to business objects to data warehouses to the graphical user interface. Without writing a single line of code. Best of all, OneWorld with CNC will work with UNIX, Windows NT, OS/400, and MVS, as well as the leading SQL databases. And it's only from J.D. Edwards, a leader in business solutions, with almost 4,000 customers in more than 90 countries. For a free white paper, call 1-800-727-5333. Or visit www.jdedwards.com
Extracting information from the intranet

Charles Babcock

W ebCharts is a humble name for something that should be part of your future intranet. It's one of the first data-visualization tools for end users that already knows that Web sites and letting users browse through their contents. But once at a server, a user is limited in what he or she can actually retrieve. It's extremely difficult for a user to construct his own view of data from the database. And if the user would like the view to be interactive and in real time, good luck. That's where WebCharts comes in as an early Java application.

WebCharts can be used from inside Netscape Navigator or Microsoft Explorer to build three-dimensional charts from relational database tables. If you have a sales problem buried in a row of quarterly data, you can build 3-D columns and use Virtual Reality Modeling Language to zoom past the suspect spot. In a two-dimensional chart, the problem would remain hidden.

WebCharts will shuttle the data on command and bring the Top 10 performers to the fore or shift data from the back to the front. With the movement of the cursor around a symbol, the chart rotates, giving the viewer a 360-degree view. If a view captures real business information, WebCharts has already automatically downloaded a version of itself to the client so the information can be moved and displayed there. WebCharts is made by InfoSpace, Inc., a San Mateo, Calif., startup. The company is about to release a supplementary product, WebSQL Browser. The WebSQL Browser will reside on a server and maintain a directory of databases, wherever they reside on your network.

The purpose of an intranet is to provide users with information, regardless of where it resides. While the movement of the cursor around a symbol, the chart rotates, giving the viewer a 360-degree view. If a view captures real business information, WebCharts has already automatically downloaded a version of itself to the client so the information can be moved and displayed there. WebCharts is made by InfoSpace, Inc., a San Mateo, Calif., startup. The company is about to release a supplementary product, WebSQL Browser. The WebSQL Browser will reside on a server and maintain a directory of databases, wherever they reside on your network.

The purpose of an intranet is to provide users with information, regardless of where it resides. At the meeting the said that this view is being delivered in two vehicles. The day we ship NT 5.0, we'll be able to say the Cairo vision is here. Microsoft officials didn't specify which Cairo components are slated for Windows NT 5.0.

News

OLE CONTINUED FROM PAGE 1

July 26, Microsoft has said it will do the following:

- Hand off control and future development of its ActiveX object architecture to an independent organization.
- Provide development tools for building ActiveX components on Unix platforms, including Sun Microsystems' Solaris, but without solving the need for special platform-specific versions of ActiveX components.

- Work with more than 100 other vendors to decide the future of ActiveX and the OLE technology that ActiveX depends on. But even setting up a meeting with vendors to discuss those plans has Microsoft scrambling.

Positive message

Even so, the announcements were good news to some users. "I hear a clear statement that Microsoft is committed to being open and cross-platform," said Gary Frederick, who evaluates object architecture and technology at T. Rowe Price and Associates in Baltimore. "These guys are not as interested in open architectures as they make themselves out to be."

Many large organizations have made major investments in the Object Management Group's Common Object Request Broker Architecture, the Open Group’s Distributed Computing Environment and other ways of linking users' desktops with client/server and legacy applications.

For such users, it is crucial that ActiveX truly interoperates with existing infrastructures, said Arun Dutta, a principal at Booz Allen & Hamilton, Inc. in New York. But Microsoft has dragged its feet in turning over information for linking forthcoming versions of its products to systems such as CORBA, said Chris Stone, president of the Object Management Group. Microsoft denied any such delays.

Users are also concerned about how quickly ActiveX will be developed in the future. "Microsoft can make mountains move in a short period of time," Tully said. "With an independent party, it could be much slower."

Meanwhile, ODBC coding gets green light. See page 43.

NOTE TO READERS: In this issue of Computerworld, we have continued the numbered sections on page 1 of our August 5 issue. The number is included in the form "July 26, Microsoft has said it will do the following:" located in the middle of the second column on page 5.

(www.computerworld.com) AUGUST 5, 1996 COMPUTERWORLD
one are the days when software samples arrived on cheap yet reusable floppy disks. What to do with all those unwanted CD-ROMs? Here are the Top 10 recycling recommendations, culled from various Usenet newsgroups.

1. String them up as wind chimes.
2. Tape over hole to make a coaster.
3. Substitute clay pigeon for skeet shooting.
4. F里斯bee-like flying disc.
5. Christmas tree ornaments.
6. Binary arbitrator (i.e., high-tech coin toss).
7. Use as reflectors for strings of Christmas party lights.
8. Li window box to reflect light on plants.
9. Hang them from fruit trees to scare birds.
10. String them up as wind chimes.

Dangerous demo
It's just a start-up, but network management vendor Kaspi Systems has already irritated IS officials at Arizona State University. To demonstrate upcoming tools, an "overzealous" Kaspia employee surreptitiously analyzed campus connections and posted performance reports on its Web page. Alerted to the unapproved probe, university network administrators quickly shut off the "public read" capability on its routers. They were none too pleased to see Kaspi reveal groupings and subnet configurations that could aid penetration by hackers. They also didn't want to appear to be endorsing Kaspi's products.

NetSys on Bay watch
Managers of networks built on routers from Bay Networks should get the same troubleshooting and planning capability next month that has been available for routers from Cisco Systems. Users with Bay-based or mixed networks are beta-testing a version of Enterprise/Solver — a tool that checks router configurations and tests proposed changes — from NetSys Technologies in Palo Alto, Calif.

Internet rent-a-cop
In two weeks, NetSolve plans to add Internet security to the wide-area network and systems management services provided by its network operations center in Austin, Texas. Organizations can then outsource such tasks as security assessment, firewall setup and monitoring of an intrusion detection and response system.

A fight may be brewing
In an about-face, SAP AG — which has always prided itself on being a pure software development company — will announce next week that it's getting into the R/3 implementation business. Sources close to the company say that taking control of the process is SAP's way of answering users' complaints about lengthy and costly implementations. But it puts SAP in competition with the likes of Andersen Consulting, Ernst & Young and other vendors on which SAP has traditionally relied to install its software.

Clusters rising
IBM this fall will introduce high-end Unix clustering software, code-named Phoenix, that quadruples the number of its RS/6000 servers that can be tied together. IBM supports eight-system clusters; Phoenix will handle up to 32 of its RS/6000 servers that can be tied together. IBM supports eight-system clusters; Phoenix will handle up to 32 machines initially and then expand to 128 next year. The software will ship on IBM's RS/6000 SP parallel processor system and should become available on general purpose RS/6000 early next year.

Five-ring circus
Seems as if everyone is gauging up on IBM's computing gaffes at the Atlanta Olympic Games, including syndicated columnist Dave Barry. In an amusing column Barry penned last week to chide NBC for its tape-delayed coverage of the Games, Barry described IBM as "a giant corporation with vast computer expertise. That's why we're in the Olympics of 1993." Maybe Big Blue should consider pulling the plug on all those Olympic TV commercials it keeps running.

In this column last week, an item headlined "Olympic flame burns Candle Corp." should have clearly spelled out to readers that the Candle being referred to was actually a maker of candles — not the well-known network and systems management vendor in Santa Monica, Calif. Computerworld regrets the error. To get in touch with us about news items or tips, call our 24-hour voice-mail tip line at (508) 820-8555 or our toll-free number at (800) 343-6474. News editor Patricia Keefe can be reached by phone at (508) 820-8183 or via the Internet at patricia_keefe@cw.com.

Dangerous demo
It's just a start-up, but network management vendor Kaspi Systems has already irritated IS officials at Arizona State University. To demonstrate upcoming tools, an "overzealous" Kaspia employee surreptitiously analyzed campus connections and posted performance reports on its Web page. Alerted to the unapproved probe, university network administrators quickly shut off the "public read" capability on its routers. They were none too pleased to see Kaspi reveal groupings and subnet configurations that could aid penetration by hackers. They also didn't want to appear to be endorsing Kaspi's products.

NetSys on Bay watch
Managers of networks built on routers from Bay Networks should get the same troubleshooting and planning capability next month that has been available for routers from Cisco Systems. Users with Bay-based or mixed networks are beta-testing a version of Enterprise/Solver — a tool that checks router configurations and tests proposed changes — from NetSys Technologies in Palo Alto, Calif.

Internet rent-a-cop
In two weeks, NetSolve plans to add Internet security to the wide-area network and systems management services provided by its network operations center in Austin, Texas. Organizations can then outsource such tasks as security assessment, firewall setup and monitoring of an intrusion detection and response system.

A fight may be brewing
In an about-face, SAP AG — which has always prided itself on being a pure software development company — will announce next week that it's getting into the R/3 implementation business. Sources close to the company say that taking control of the process is SAP's way of answering users' complaints about lengthy and costly implementations. But it puts SAP in competition with the likes of Andersen Consulting, Ernst & Young and other vendors on which SAP has traditionally relied to install its software.

Clusters rising
IBM this fall will introduce high-end Unix clustering software, code-named Phoenix, that quadruples the number of its RS/6000 servers that can be tied together. IBM supports eight-system clusters; Phoenix will handle up to 32 of its RS/6000 servers that can be tied together. IBM supports eight-system clusters; Phoenix will handle up to 32 machines initially and then expand to 128 next year. The software will ship on IBM's RS/6000 SP parallel processor system and should become available on general-purpose RS/6000 early next year.

Five-ring circus
Seems as if everyone is gauging up on IBM's computing gaffes at the Atlanta Olympic Games, including syndicated columnist Dave Barry. In an amusing column Barry penned last week to chide NBC for its tape-delayed coverage of the Games, Barry described IBM as "a giant corporation with vast computer expertise. That's why we're in the Olympics of 1993." Maybe Big Blue should consider pulling the plug on all those Olympic TV commercials it keeps running.

In this column last week, an item headlined "Olympic flame burns Candle Corp." should have clearly spelled out to readers that the Candle being referred to was actually a maker of candles — not the well-known network and systems management vendor in Santa Monica, Calif. Computerworld regrets the error. To get in touch with us about news items or tips, call our 24-hour voice-mail tip line at (508) 820-8555 or our toll-free number at (800) 343-6474. News editor Patricia Keefe can be reached by phone at (508) 820-8183 or via the Internet at patricia_keefe@cw.com.
With award-winning performance, outstanding service and reliability to back it up, the Micron™ Millennia™ Pro delivers superior power. You get 200MHz computing power enhanced for extra-high performance, a full range of options and our outstanding Micron Power™ warranty*. Choose a Millennia Pro or Millennia Pro Plus today and get the performance and service that make Micron the powerhouse of the industry.
A lot of people think all memory is created equal. Until their system goes down. You've got to be sure that the memory you choose is both compatible and reliable.

That's why so many computing professionals choose Kingston® memory. Kingston is the world's leading manufacturer of memory modules. We make memory for almost every PC, server, workstation, and printer out there. Our engineers customize the design of each module according to the specifications set by the leading system manufacturers. To ensure dependability, we use exactly the same memory components those manufacturers use. And we test every cell on every chip on every module. (On a 16 megabyte module, that's 128 million cells.)

One more thing: Our memory costs up to 50% less than the system manufacturer's brand. To find out how much you can save, just ask your value-added reseller or call Kingston. After all, no one needs a crash course in memory.

For more information call us at (800) 435-0057 Visit our Web site: http://www.kingston.com/cwm.htm

Kingston Technology Corporation, 17600 Newhope Street, Fountain Valley, CA 92708 USA, (714) 435-1000, Fax (714) 435-2699. ©1996 Kingston Technology Corporation. All rights reserved. Kingston is a registered trademark of Kingston Technology Corporation.