EMC recasts RAID

By Craig Stedman

Would RAID by any other name smell as sweet? EMC Corp. confirmed last week that it will try to answer that question in the third quarter by outfitting its fast-selling Symmetrix mainframe disk arrays with a hybrid version of RAID. The hybrid is the redundant storage technology. EMC said users will be able to split their Symmetrix boxes into pieces that could be separately configured with the upcoming RAID-5 or the disk mirroring and dynamic sparing approaches it already offers.

In addition, sources familiar with the company's plans said both 3380 and 3390 data formats will also eventually be supported in a single array.

Users and analysts

NT Server jumps on PowerPC bandwagon

By Laura DiDio

Microsoft Corp. last week revealed that it is set to beta-test an enhanced version of its Windows NT Server that will add much-anticipated support for the IBM PowerPC server platform, PCMCIA adapters and file compression capabilities.

The forthcoming NT Server 3.51 upgrade will ship to beta sites in the first quarter and may ship in volume during the second quarter, said Mike Nash, Microsoft's group product manager for Windows NT.

One feature that will not be bundled into NT Server 3.51 is support for Novell, Inc.'s NetWare. Instead, the upgrade will support NetWare as a separate option that will be "priced competitively," Nash said.

Users and analysts familiar with the 3.51 release gave new features a thumbs-up—especially support for the PowerPC platform. The enhancements will bolster Microsoft's already strong presence as a provider of application and database servers, they said.

"Support for the IBM PowerPC ... is really nice," said Randy Dugger, director of information systems at Liposome Technology, Inc., a Menlo Park, Calif., pharmacy.

Lotus drops prices to build Notes base

By William Brandel

Embowed by Microsoft Corp.'s delays in delivering its Exchange Server, long touted as a "Notes killer," Lotus Development Corp. last week launched a blitz of price cuts and bundling arrangements. The moves were designed to persuade corporate sites to take Notes beyond the pilot stage.

Perhaps most significant among the announcements was Lotus' capitulation to user demands for a runtime client version of Notes. With an expected street price of $120, the software does not include the application development and administration capabilities found in the full-blown client (see chart above). Lotus did, however, dropped the price of the client/server version of Notes from $330 to $275.

Users now have a choice of pricing options for Notes in addition to a wide range of platform plans. In fact, some large sites have found smarter ways to negotiate software support contracts and cut their bills by half or two-thirds. That is a pretty penny, considering that the 1994 Computerworld Premier 100 companies spent an average of 47% of their annual software budgets on maintenance and support.

"Despite what vendors may have you believe, maintenance fees are not written in stone or even mud. Everything's negotiable," said Bill Zeit, president of Zeit and Associates, a New York consulting firm.

Indeed, squeezing a better deal out of Oracle Corp., a notorious negotiator, was Zeit's last...
First it was Michael Jackson and Lisa Marie Presley. Now the stress and strain of downsizing, reengineering and restructuring are turning HR and IS managers like Georgia-Pacific's Gwen Barker and Rick Partridge into...

See MANAGEMENT, PAGE 69

Users don't have to bleed money for software maintenance costs if they muscle vendors into signing more flexible support contracts. Some large sites have found smarter ways to negotiate software support contracts and cut their bills by half or two-thirds. Page 1

Information warfare specialists warn that risks from info-assassins are growing. Devices such as HERF guns were among a grim list of computer-disabling devices highlighted at a recent computer security conference. Experts say the majority of IS managers pay scant attention to such threats from electromagnetic weapons. Page 1. Meanwhile, two new breaches on the Internet highlight the need for tighter security. Page 12

Lotus slashes prices in an effort to persuade corporate sites to take Notes from product pilot to groupware standard. One of the most significant moves by Lotus was its capitulation to user demands for a runtime client version for Notes. That client package is expected to carry a street price of $125. Page 1

Computer Associates' Chairman and CEO Charles B. Wang says his company has shifted its focus from pure sales to maintaining relationships with customers. Page 16

The meshing of Mobil Research & Development's business and technology directives — through which Mobil links its R&D strategy with its customers' plans — is one example of how organizations can better leverage their technology investments, as shown at a recent gathering of The Conference Board. Page 24

On site this week: When Texas Commerce Bank added a new 401K business unit, workflow was at the heart of the system design. Page 27. Videoconferencing is key to Modern Engineering's becoming a worldwide supplier of automotive engineering services. Page 32. Medical products company The Darby Group rearchitected its IS operation, trimming down its mainframe complex while boosting PC and LAN use. Page 42. Ogden Projects has been energized by an AS/400-based imaging system. Page 57

The 5th Wave by Rich Tennant

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Cincom sidelines Supra database

By Rosemary Cafasso and Craig Stedman

Cincom Systems, Inc. is saying hello to object database technology and goodbye to the long-delayed distributed version of its Supra Server relational database and some Supra users are wondering what to say in return.

Marco Emrich, senior director of the advanced technology group at Cincom, confirmed last week that the Cincinnati-based company has dropped plans to market Supra Server Version 3.0, except to the federal government. Instead, it is substituting an object/relational hybrid based on technology from Unisql, Inc. in Austin, Texas. The hybrid, referred to internally as the Total Object Hub, entered production this month, according to Emrich.

Even the government release of Supra 3.0, which was to replace Supra 2.7 when it shipped last September, will be replaced after Cincom adds support for the Federal Information Processing Standard 127 specifications to the Unisql-based product, Emrich said. He did not say when that will occur.

Supra 3.0 was originally due in 1992 (see story) but Cincom ran into engineering and testing delays and eventually revisited its strategy, Emrich said. Acknowledging its bit presence in the Unix database market, the company switched to the Unisql technology because it can work in environments with databases from multiple vendors, he added. Supra 3.0, on the other hand, would have required customers to standardize on that product at all sites.

In the dark

Yet several Cincom customers who were looking forward to the distributed capabilities that Supra 3.0 was supposed to provide -- such as protected two-phase commit and access to data tables at different sites -- said the new object-based approach remains a bit of a mystery.

"I can't comment on a strategy that hasn't been articulated," said David Sacco, MIS manager at the rolled products division of Alcan Aluminum Corp. in Cleveland. Cincom has not laid out a "slick technology in there," he said. "It's a shame to see that go away."

However, Richard Finkles-tein, president of Performance Computing, Inc. in Chicago, noted that the distributed approach of Supra 3.0 was superseded by technology for replicating central databases to remote sites.

Racotek offers wireless 'Key'

Environment allows transparent messaging across incompatible networks

By Michael Fitzgerald

Valentine's Day should mark a major breakthrough for corporate IS managers who have been flitting with the concept of deploying wireless data services.

That's when Racotek, Inc. in Minneapolis will announce KeyWare, a messaging environment that appears to hand information managers a wireless bouquet.

KeyWare will provide a common application programming interface (API) designed to let users send messages transparently over incompatible networks, sources close to the company said. Racotek will announce the product at Networks Expo-Boston on Feb. 14-16, the sources said.

According to today's issue of Andrew Seybold's "Outlook on Computing and Communications," a newsletter in Brookdale, Calif., KeyWare is "an open, scalable Wireless Distributed Computing environment" similar to the Distributed Computing Environment.

KeyWare supports Cellular Digital Packet Data (CDPD), Ram Mobile Data USA, L.P.'s Mobilex network and Ardis Co.'s Advanced Radio Data Information Services (ARDIS) network. It also supports circuit-switched cellular networks. Using a feature that sources called CellSmart, it can decide on a case-by-case basis whether circuit-switched or CDPD is the best mode to transfer data.

This array of network support means KeyWare will bring elements of the wired telephone system to the wireless market. Just as a telephone user can make calls without knowing that the country's phone network is made up of disparate long-distance and local networks, KeyWare will help ensure that a CDPD user can send data to an ARDIS user without having to think about it.

No question

Andrew Seybold, editor of the "Outlook" newsletter, wrote that "there will probably never be one single carrier that will be able to provide coverage sufficient to satisfy most companies. This ability, coupled with wired access, makes the Racotek system an important addition to wireless mobile computing."

This means that corporate users trying to decide which network to pick, despite the drawbacks of each, can now simply modify their code to a designated Racotek host server.

"We'd be interested in something like that," said Jeffrey Kreafle, manager of network management at PECO Energy Co., in Philadelphia. "It's a wireless wide-area network, said David L. Lyon, president of Pacific Communication Sciences, Inc. in San Diego.

RACOTEK'S KEYWARE CAN SUPPORT MESSAGE PRIORITIZATION AND HANDLE MESSAGES OF UP TO 8K BYTES IN LENGTH. IT FEATURES A RECOVERY PROVISION TO REESTABLISH NETWORK LINKS FOR MOBILE USERS AND ALSO HAS THE FOLLOWING SERVICES:

<table>
<thead>
<tr>
<th>Feature</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Naming</td>
<td>Identifies users, applications and devices on a network.</td>
</tr>
<tr>
<td>Message</td>
<td>Allows users to exchange different data types. Has reliability features as end-to-end acknowledgment and store-and-forward data delivery.</td>
</tr>
<tr>
<td>Time</td>
<td>Allows for synchronized clocks on network devices, improving scheduling and sequencing for mobile users.</td>
</tr>
<tr>
<td>Optimal delivery</td>
<td>Provides troubleshooting utilities, performance analysis and routine network management data.</td>
</tr>
</tbody>
</table>

Source: Andrew Seybold's "Outlook on Communications and Computing," Brookdale, Calif.
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Compaq takes market hit despite growth

By Jaikumar Vijayan

In what some industry analysts described as a startling reaction to one of the PC industry's better report cards, Compaq Computer Corp.'s stock took a battering early last week, soon after the company announced record fourth-quarter and 1994 year-end results.

Shares tumbled by as much as 12% last Wednesday after the Houston-based firm announced record earnings of $867 million on revenue of $10.4 billion for 1994. That response—which some analysts called an overreaction—could have been prompted by inflated Wall Street expectations of Compaq, as well as concerns over first-quarter earnings after Compaq warned of a "relatively flat" period just ahead.

The market's caustic reaction seems to be about Compaq's performance in 1995. In fact, it could prove to be a cautionary sign for the desktop giant, analysts say, because Compaq still faces a number of potentially serious problems in the short term, including the following:

- A complete product transition in the first quarter that could result in weak sales as customers wait for new products.
- Continued problems with a rapidly aging portable computer line that has already cost the company its leadership position in the mobile market [CW, Jan. 23].
- A serious backlog problem that was substantially reduced in the last quarter but still exceeds $2 billion.
- A weak Pentium presence that has helped vendors such as Dell Computer Corp. and Gateway 2000, Inc. to the top of the small but growing market segment of corporate Pentium buyers.

Compaq disagrees

Compaq maintains that most of these are temporary problems, if indeed problems at all. For example, the company's next round of product introductions, slated for later this quarter, will launch a number of Pentium-class desktop PCs and servers based on Intel Corp.'s Pentium and Advanced Micro Devices, Inc.'s next-generation K5 chips. Those products will include notebooks and PCs for the home market.

Analysts, however, speculated last week that news of Compaq's impending product updates could substantially limit demand as customers hold out for better products and prices.

But Compaq's seeming lethargy in the booming portable market is causing some real concern.

For instance, rivals such as Toshiba America Information Systems, Inc., IBM, and a rapidly emerging Dell Computer Corp. have begun to announce portables with market-winning features, such as 10.4-in. screens, CD-ROM drives, and business audio capabilities. These features are still lacking in Compaq boxes, said Ted Julian, editor of "The Grey Sheet," a newsletter published by International Data Corp. in Framingham, Mass.

Compaq said its current inventory is mostly spare parts and components. Finished goods inventories were pared down significantly in the last quarter, the company said.

One concern analysts have expressed is that excess inventory could lead to a situation similar to the one IBM faced last year when it was stuck with thousands of unsold ValuePoint systems. It eventually auctioned them off.

On the plus side for users is the fact that Compaq's climb to the top of the PC market and its attempts to consolidate its position there could lead to some intense price wars among top-tier vendors, especially in the mushrooming PC server arena, analysts said.

Judge probes deeper into Microsoft antitrust case

Sporkin described as brilliant, energetic by observers

By Mitch Betts and Stuart J. Johnston

WASHINGTON

Microsoft Corp. and the U.S. Department of Justice had hoped for quick and easy court approval of their proposed antitrust settlement. Instead, they got U.S. District Court Judge Stanley Sporkin, who is viewing the case as anything but routine.

Conventional wisdom holds that antitrust settlements are usually rubber-stamped. But an inquisitive Sporkin has taken an intense interest in Microsoft Corp. and the U.S. Department of Justice, where he prosecuted cases charging companies with misleading the public or failing to disclose important information. In the Microsoft case, he appears to be particularly concerned about charges that Microsoft misleads rivals about new products and withholds information about its market-dominating Windows product line from competitors.

After 20 years investigating white-collar crime, Sporkin also likes to find the "smoking gun." So when he came across internal memoranda that purportedly show that Microsoft's executives are making vaporous announcements to freeze the market, Sporkin called them "conspiratorial documents" worthy of more investigation.

Analysis

A former enforcement director at the SEC, Sporkin was appointed to the bench in 1986 by President Ronald Reagan.

Sporkin's approach to the Microsoft antitrust case is colored by his experience at the SEC, where he prosecuted cases charging companies with misleading the public or failing to disclose important information. In the Microsoft case, he appears to be particularly concerned about charges that Microsoft misleads rivals about new products and withholds information about its market-dominating Windows product line from competitors.

After 20 years investigating white-collar crime, Sporkin also likes to find the "smoking gun." So when he came across internal memoranda that purportedly show that Microsoft makes vaporous announcements to freeze the market, Sporkin called them "conspiratorial documents" worthy of more investigation.

Judge Stanley Sporkin takes unorthodox approach

Monopoly?
The Maverick Computer & Communications Industry Association in Washington filed a last-minute brief saying it is concerned about charges that Microsoft misleads rivals about new products and withholds information about its market-dominating Windows product line from competitors.

After 20 years investigating white-collar crime, Sporkin also likes to find the "smoking gun." So when he came across internal memoranda that purportedly show that Microsoft makes vaporous announcements to freeze the market, Sporkin called them "conspiratorial documents" worthy of more investigation.

Gates groans

However, Microsoft Chairman and Chief Executive Officer Bill Gates last week lashed out at Sporkin for fundamentally misunderstanding the nature of the software industry.

"He might as well accuse Jack and the Beanstalk of doing awful things. He can't understand that when you announce a product in advance, it's only questionable if you do it knowing that it's false. Yes, we announced QB3 [QuickBasic 3.0, a preannouncement Sporkin characterized as a 'smoking gun'] in advance, but... everything about it was totally true," Gates said.

Gates described the three-phase investigation—explored first by the Federal Trade Commission, then by the Justice Department and now by Sporkin—as "an approach unique in American jurisprudence." He also attacked Gary L. Reback, the lawyer representing three unnamed Microsoft competitors, for "soft making vaporware announcements to the monopolist to offer volume discounts for its operating system. The association also worried that Microsoft will 'leverage' its market power in operating systems to dominate the application market."

Sporkin further argued that it is improper for the judge to second-guess the department's decision on what charges to file. "I'm the prosecutor. You're the judge," he lectured.

Speculation has now arisen that Sporkin's unconventional approach might cause any decision he makes to be overturned on appeal. Noting Bingaman's charge that Sporkin's "substantial" decision on what charges to file. "I'm the prosecutor. You're the judge," he lectured.

Speculation has now arisen that Sporkin's unconventional approach might cause any decision he makes to be overturned on appeal. Noting Bingaman's charge that Sporkin's "substantial" approach to the Microsoft case might lead to an "outrageous" decision, Gates said: "She's right. He's out of bounds."
Microsoft to align Cairo, Windows 95

By Stuart J. Johnston

When Microsoft Corp. ships its Cairo update to Windows NT next year, it will also ship an update to Windows 95 that enables the client to tightly integrate with the server operating system, said Chairman and Chief Executive Officer Bill Gates last week.

In fact, once Cairo ships, the company plans to release upgrades to both platforms simultaneously from then on.

"The benefit to customers of having the low-end version [of Windows] and the high-end version [of Windows NT] justifies us going to a lot of hard work to keep those things in sync," Gates said.

"Over time, we've got to get the two release dates lined up, so when we come out with Cairo, we will do a modest release of the desktop version to line up with [it]. And [from] that point forward, we'll do releases at the same time," he said.

Cairo adds an Object File System (OFS), distributed network support for the Object Linking and Embedding technology and the Windows 95 user interface to the Windows NT 3.5 kernel. The addition of OFS will enable users to search for information on local machines and across a network based on a wide variety of criteria.

While there will not be any significant changes to the Windows 95 user interface, changes are necessary to give users access to Cairo's advanced features, Gates said.

A good threat

Two industry analysts said Microsoft's evolving client/server strategy is good for customers as well as a threat to the company's operating system competitors, particularly IBM and Novell, Inc.

"By Microsoft having both ends of this, they can have better synergism between the desktop and the server," said Rob Enderle, a senior industry analyst at Dataquest, Inc. in San Jose, Calif. "It really looks like they know what they're doing, and with the lack of a cohesive counter strategy from their competitors — I mean Novell, IBM and Oracle — it's looking more like a Microsoft world."

Microsoft has "been getting a lot of pressure to synchronize the two systems, and I think Bill has been hearing that from customers really loud," said Jesse Berst, editorial director of the industry newsletter "Windows Watcher" in Redmond, Wash.

Berst and Enderle see the synchronization of desktop and server system releases as a first step toward their unification into a single operating system code base several years from now.

"They've said for a long time that they want to merge the two code bases," Berst said. "They're currently predicting that the desktop hardware will be capable enough to allow the merger in 1997 or 1998. Then you'll have a common desktop and server system.

Additionally, Microsoft is pushing to make sure it meets its latest schedule for Windows 95, a schedule Gates said the company can meet.

He said users will be able to judge whether or not Windows 95 will be available for sale in August by whether the company begins its so-called preview program on time in March.

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Mainframe users: Don’t touch that plug

Those who counted on the unconditional demise of the mainframe should visit Howard Hunter, manager of Occidental Petroleum’s telecommunication and computing facility in Tulsa, Okla. Three of the company’s four divisions have shifted to client/server computing with Unix servers and PC/workstation clients. But the largest division, Occidental Chemical, has shunned client/server in favor of adding new applications to Occidental’s two Amdahl mainframes.

“Our chemical plant operations depend on the reliability of big iron,” says Hunter, citing a mainframe virtue that got lost in the rush to client/server nirvana. Environmental monitoring, process management, and materials and supplies inventory will remain mainframe-based applications at Occidental for the foreseeable future. And Hunter is being forced to buy another mainframe to replace one or both of his existing 100-MIPS Amdahl 5980s. “We’ll need 250 to 300 mainframe MIPS by the end of the year,” he said. Hunter’s position is not unusual, according to figures on mainframe sales. Annex Research in Phoenix reports that the total number of mainframe MIPS shipped by IBM and other mainframe-compatible suppliers climbed steadily to a peak of 135,000 MIPS in 1991 and then dropped to 115,000 by the end of 1993. With millions of PCs and servers being installed, it appeared as if mainframes were shuffling in and out, heading for a permanent retreat.

But last year, the decline reversed itself. Mainframe MIPS sales leaped 39% to 160,000 in 1994 and will reach an estimated 180,000 MIPS in 1995, says Bob Djurdjevic, president of Annex Research.

But isn’t this reversal temporary? Won’t the continued shipment of powerful PCs and microprocessor-based servers eventually undercut big iron’s lease on life?

Not exactly. Contrary to predictions, the mainframe will certainly be around until the year 2000, and unplugging it prematurely could prove risky to the IS director’s health.

"By having the [mainframes and client/server systems] side by side, we can see the fledgling nature of the Unix servers,” Hunter says. “All those tools that we take for granted on the mainframe [performance monitors, systems management, network management] are not available on Unix.”

Several vendors have assembled sets of system utilities for Unix systems, including Fourth Dimension, Tivoli, Computer Associates and OpenVision. But, Hunter explains, those tools that are available come from different vendors and don’t “interlock.”

In the midst of a seemingly unanimous acceptance for client/server elsewhere, Hunter must heed a schism in his own organization, which requires both mainframe services and downsizing. He believes that the demand for mainframe MIPS will level off in 1996 or 1997, and even the chemical division will start moving toward client/server. But he’s 100% sure.

One reason mainframe MIPS reversed their fall and ticked upward in 1994 is that the price per MIPS dropped radically. What was a $112,000 MIPS in 1990 is now a $30,000 MIPS, Djurdjevic says. If the price decline continues, the chemical division will no longer have a financial incentive to migrate to Unix. It might stick with MVS or invoke the IBM option of running Unix on the mainframe.

But the main reason that mainframes are still around is because of their highly engineered reliability. Unlike a PC or Unix workstation, a mainframe running MVS can take a bullet through the heart and, after a slight stutter, resume processing much as before even if a running application blows up and a connected device sends errant signals. A mainframe’s many-redundant, self-monitoring, self-correcting features keep it up and running regardless of individual process errors.
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Silicon Graphics, Inc. (SGI) made its bid to deliver one-stop shopping for Internet document authoring last week. The vendor unveiled an $11,000 packaged Unix system that includes hardware, icon-based multimedia software and World-Wide Web communications links to create Internet home pages for business.

Analysts say they expect other workstation vendors to follow suit by packaging existing Unix workstations and servers with icon-based software. So far, there have been few icon-based authoring packages to speed Internet home page development, they said.

Home pages are created with Hyper-Text Markup Language (HTML), which lets users jump between Web documents by selecting highlighted words.

Other companies have already created software to mask the complexities of writing in HTML. Interleaf, Inc. announced its Cyberleaf icon-based authoring software last fall, and Microsoft Corp. is promising Internet Assistant, an add-on to Microsoft Word that can generate HTML documents for Internet use.

Last week, SGI announced its Web-Magic Author icon-based software and packaged its Indy and Indigo2 workstations as Internet development systems. Netscape Communications Corp.'s $39 Netscape Navigator client software and $1,495 Netsite Communications server software will be bundled with SGI's Unix machines, which range from $11,000 to $45,000. Marc Andreessen, co-founder of Netscape, said Netscape 1.1 will support the transmission of three-dimensional graphics this spring. Last week, SGI demonstrated one such 3-D animation written with its Open Inventor software.

Patience is key ingredient

Creating an Internet home page requires patience as well as expertise. Greg McArthur, a software engineer who designs home pages for the National Center for Atmospheric Research in Boulder, Colo., edits HTML documents using the Unix-standard vi text editor on an Indy workstation and loads them onto a server to see the final result. "This moves us forward, leapfrog-fashion," McArthur said. "This software will make it faster for me and for a lot of people."

But using a word processor to create HTML text is not as hard as ensuring that the document can be easily understood—even if read on character-based screens, said Doug Johnson, a senior staff scientist at AER, Inc. in Cambridge, Mass. "You want to tailor your serving capability so that it looks good and works well for a variety of users," Johnson said.

Web nodes double every few months, but many businesses have yet to launch home pages, said Frank Gilbane, a director at CAP, Inc., a Marshfield, Mass., research firm. "Corporate people are holding back not only because of security concerns, but there are some that need the full SGML [Standard Generalized Markup Language] features to fully describe documents," he said. SGML supports more formatting and tables.

Unix servers dominate the worldwide Internet server market. Sun Microsystems, Inc. sells the Netra packaged Internet server, which includes security firewalls. Sun also has a partnership with Interleaf, but has not bundled the Cyberleaf authoring product with Sun systems.

"Our business model is to work with key independent software vendors, Sun's Chief Technology Officer Eric Schmidt said last week.
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Revolve seamlessly integrates with Micro Focus COBOL or can be used as a stand alone development, testing and analysis environment. In either case it lets you manage your system and see exactly how far your changes will reach.
Hackers try new tacks
Agency sounds warning on 'significant new threat to Internet'

By Gary H. Anthes

An increasingly sophisticated cadre of computer hackers can be met at every turn by equally determined defensive measures. But unfortunately, too few users are employing the defenses.

Last week, hackers used two well-known, but apparently heretofore unused, methods to gain illegal access to computers at Stanford University and the University of California at San Diego.

"The two techniques are known as "Internet Protocol spoofing," which enables an intruder to gain access to a system, and "hijacked session attacks," in which an intruder gains control of other sessions active on the system.

Although only two intrusions were reported last week, "there are certainly others going on, and I suspect there are a lot we haven't found yet," said William J. Orvis, a team member at the U.S. Department of Energy's Computer Incident Advisory Capability (CIAC) at Lawrence Livermore National Laboratory in Livermore, Calif.

The attacks triggered alerts over the Internet from the CIAC and the Computer Emergency Response Team at Carnegie Mellon University in Pittsburgh. The alerts described straightforward and relatively primitive countermeasure users can take to thwart the attacks.

However, the CIAC warned, "These attacks represent a significant new threat to Internet systems. Without proactive measures in place, these attacks are not very difficult to detect or defend against. [The] CIAC strongly recommends sites implement the solutions described below as soon as possible."

Automated woe
Clifford Neuman, a computer scientist at the Information Sciences Institute at the University of Southern California at Marina Del Rey, said the attacks used in the CIAC attacks had not been used sooner because they are difficult to execute. But now, he said, someone has written a program that automates the process.

"It is likely that this program is going to be widely available among the community of hackers," Neuman warned.

While computer security experts praised the alerts as offering sound advice, many said they did not go far enough. "We all understand the limitations of using IP addresses for authentication," said Stephen T. Kent, chief scientist for security technology at Bolt Beranek and Newman, Inc. in Cambridge, Mass. "But we haven't yet made the jump to cryptographically-based continuous authentication, which is what the military does and what we should do.

"Similar incidents will continue to occur," said Jim O'Neil, information security manager at Pacific Bell in San Francisco. "This will remain a hot issue until administrators take appropriate action. As [they do], interest in perpetrating this type of attack will wane."

"I don't think hackers are getting the upper hand," said Daniel Geer, vice president for security consulting at OpenVision Technologies, Inc. in Pleasanton, Calif. "But the number of naive network in the world is going up very fast. This is an area where a little bit of preparation is worth a lot of cure."

Tactical maneuvers

EXPERTS SUGGEST THESE COUNTERMEASURES TO INFRINGEMENT:

**Vulnerability: IP spoofing**

This allows an intruder to essentially impersonate a local system's IP address. Other local systems can be tricked into believing incoming connections from the intruder actually originate from a local "trusted host" and will not require a password.

**Defense**

Filter packets as they enter your router from the Internet, blocking any packet that claims to have originated inside your local domain.

**Vulnerability: Session hijacking**

Once the intruders have root access on a system, they can use a hacker program to dynamically modify the Unix kernel, allowing them to hijack, or take over, an existing terminal and log-in connections from any user on the system.

**Defense**

Prevent root compromise through careful system management, installation of security patches and network controls such as firewalls. Sites not requiring SunOS 4.1.1 should disable this feature.

Source: Computer Incident Advisory Capability, Lawrence Livermore National Laboratory, Livermore, Calif.

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Platform vendors exit network consortium

By Steve Moore

Hopes that application and platform vendors would cooperate to provide users with sorely needed network management standards dimmed last week as the four platform vendors pulled out of the Management Integration Consortium (MIC).

But despite the departure of Hewlett-Packard Co., IBM, Digital Equipment Corp. and SunSoft, Inc. from the group, the remaining members - more than 150 applications vendors - plan to continue the cooperative development of MIC standards. That will begin with a common data repository and a common data access application programming interface.

The platform vendors said such standards should be pursued through established standards groups such as X/Open Co., the Network Management Forum (NMF) and the Internet Engineering Task Force.

MIC Chairman Jim Corrigan, who is also president of KI Networks, Inc. in Columbus, Md., stressed that the MIC's goal is to accelerate standards development in cooperation with other such groups. He noted that the MIC has submitted its repository proposal to X/Open and has adopted the NMF's Open Management Edge specification for application integration.

Users applauded the MIC's goals but remained skeptical about the consortium's effectiveness without the support of the leading platform vendors.

"A standard way for management tools to exchange information would make a management operations center a heck of a lot easier to implement," said Mike Prince, MIS director at Burlington Coat Factory in Portland, Me. However, he added, the consortium will have trouble without HP and Sun in particular because users of OpenView and SunNet Manager constitute an "overwhelming preponderance of people using network managers."

"We've all been jaded because we read in the press about these consortia starting up, and that's the last time we ever hear about them," said Paul Jones, general manager of information services at Unocal Corp. in Anaheim, Calif. "Another problem, he said, is that proposed standards too often "take so long to go through committee that by the time they come out, technology has gone past them."

Corrigan said products implementing MIC standards will ship by year's end.

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Third try could be charm for Newton

By Mark Halper

Sobered by a market that did not share the vendor's early euphoria for personal digital assistants (PDAs), Apple Computer, Inc. today will introduce the third iteration of its Newton MessagePad.

The Newton MessagePad 120 provides users with twice as much memory as predecessor MessagePad 110 - 2M bytes vs. 1M byte. But the 2M-byte version will be priced at $699, while the 1M-byte MessagePad 110 costs $599.

The MessagePad 120 has improved screen resolution and enhanced communications capabilities. It also allows for easier swapping of software with desktop computers.

Whereas Apple once ballyhooed the Newton as a near-revolutionary product, the third iteration does not.

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- Best Virtual Network Services
- Best 800 Services
- Best Dedicated Services
- Best Switched Digital Services
- Best Overall
- Best Technology
- Best Price/Performance
- Best Service/Support
- Best Documentation
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Lotus hears call of CC:Mail users

By Suruchi Mohan

ORLANDO, FLA

Making CC:Mail administrators’ lives a little easier was the goal of several products announced at Lotus Development Corp.’s Lotusphere developers conference here last week.

One specialist was the DB8 post office, which is expected to ship in mid-1995. DB8 has a file-sharing architecture that will support the shipping version, or Version 2.1, and the yet-to-be-released Version 2.5 on the client. But for users, the biggest advantage of DB8 is its 24-hour, 7-day operation.

This continuous uptime means users can be on-line while administrators tinker with backups and reclaims, explained Vince Shilling, a CC:Mail administrator at PepsiCo Foods International in Plano, Texas. And that removes a major hurdle from the task of administering a post office, especially in environments that support many mobile users and span several time zones, he added.

“The only reason to upgrade to DB8 right now is the 24-by-7 operation,” said Kevin Amos, a support analyst at Placer Dome Canada Ltd. in Vancouver, British Columbia. Otherwise, “who cares about the database these days as long as you get your mail?”

Full of features

Users also applauded the following DB8 features:

• Allows Messaging Application Programming Interface clients to be used with the post office, which means administrators do not have to mandate which mail package end users should use.

• Leis users move a file from the server to a laptop without using the exchange import utility.

• Allows administrators to add fields to the database.

Additionally, Lotus officials talked about building a client that would work on the DB8 post office and with Notes. But “they’ve never shown that,” said Cliff Conneight, president of The Conneighton Group, Inc. in Hollis, N.H. “All they showed was Notes. I don’t think we’ll see that product in 1996.”

Lotus also announced a slew of other products and business partnerships. Products include the Lotus Fax Server, which will replace CC:Fax, and Lotus Video for Notes Release 1.

The vendor also signed an agreement with AT&T Corp. whereby the two companies will integrate their voice mail and electronic-mail systems. It also sealed a deal with Motorola, Inc. to develop and market the AirMobile wireless technology.

The runtime price-cutting move was one that Lotus had been extremely reluctant to make. As recently as three weeks ago, Jeff Papows, vice president of Lotus’ communications group, said the vendor was just beginning to get the message that users wanted a runtime version of Notes. But another Lotus executive said the company began considering the change “the day after the Notes Express announcement.”

Lotus is gambling that by cutting prices and forcing short-term profits, it can proliferate its product well beyond the 1.3 million seats on the market today.

A company first

In its fourth quarter of 1994, Lotus’ communications products pulled in $134 million in revenue compared with $120 million in revenue from desktop applications. That was a rise for the company. By comparison, Lotus pulled in $211 million in desktop sales and $68 million in communications products for the same quarter in 1993.

While the lower prices may not have dampened short-term revenue, Wall Street analysts were buoyed by the move. They noted that selling more clients at a lower price could sell more servers and services, thus broadening the company’s installed base.

“This would probably get another million seats from the Macintosh deal alone,” said Matthew Cain, an analyst at Meta Group, Inc., a consulting firm in Stamford, Conn.

The Macintosh bundles are expected to ship by the end of the second quarter.

How long Lotus will keep its prices down is anyone’s guess. When asked if Lotus would consider raising server prices to compensate for client revenue, Papows would only say that the company is not considering raising server prices now. “I hope they don’t,” Bowden said. “But it wouldn’t surprise me.”

Lotus execs would not entertain questions about the perennial rumors about Lotus’ chance of acquisition. Chairman Jim Manzi would say the company is anyone’s guess. When asked if Lotus would want to hear about the possibility of being sold to Microsoft, the company would only say that the company is not considering buying server prices now. “I hope they don’t,” Bowden said. “But it wouldn’t surprise me.”

Lotus broke industry protocol by not leaking the news of its runtime client. As a result, not all users were pleased with the offering. A Lotus exec said some customers who recently bought into volume Notes licensing agreements were unhappy to find they could have waited a week and saved tens of thousands of dollars. The executive said Lotus would give individual purchase credits to some of these customers.

In a keynote, one pundit asked the audience to think of its competition five years ago and five years hence. Manzi later said, “Gee, things can be pretty stale at Lotus.”

Lotus drops

CONTINUED FROM PAGE 1

forms on which they can run the groupware product.

“By offering the runtime [client], it removes a big obstacle to us putting everyone at our site up on Notes,” said Mark Bowden, a senior information systems analyst at First Mississippi Corp. in Jackson, Miss.

So far, First Mississippi has run Notes mostly in isolated pockets of its financial departments. Bowden said the high client prices under the past pricing structure prevented his firm from rapidly deploying more Notes clients.

“They should have done this before,” echoed Peter Nordman, a data communications specialist at Valmet’s Proenos Data Corp. in Jyvaskyla, Finland.

The welcome reception for the sought-after runtime client was a far cry from the thumbs-down reaction users gave the initial Notes 4.0 demonstration.

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“What do they offer that’s new?” asked a user at an electrical appliance company.

News

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Digital enters remote market with NetRider

By Neal Weinberg

Digital Equipment Corp. will jump into the remote access market next week with a software package designed to help information systems managers tame the menagerie of laptops, PCs and client software being used by telecommuters.

The Digital NetRider 90 and NetRider 900 systems, slated to be unveiled Feb. 6, are aimed at companies with remote offices, mobile sales forces and telecommuters. "This is an important market," said Kimball Brown, an analyst at Dataquest, Inc. in San Jose, Calif.

Brown said there are plenty of niche players on the scene already, but there is an opportunity for Digital if its product stands out and the company leverages its sales force.

The NetRider software was designed to link different types of laptops and PCs, including Apple Computer, Inc.'s Macintosh, into the network through TCP/IP, IPX or AppleTalk. The system is backed by an 8-port or 32-port access server. It includes Internet browser software and unlimited licensing for remote nodes.

Children's Hospital in Boston plans to improve its remote access to an ever-increasing number of clinicians and doctors' offices, said Dave Power, a network analyst at Children's. When it does, "doctors will be looking to us for a complete solution," he noted.

"taken the chicken way out," he said, Stampede Technologies, Inc. in Dayton, Ohio, provided software for NetRider that lets people in the field gain remote access to their office computers. The NetRider 90, priced at $3,400, will be available next week; the 900 model will be available in March for $9,345.

Users shape new CDPD specification

By Michael Fitzgerald

Users should now find the Cellular Digital Packet Data (CDPD) protocol more to their liking thanks to an update to the specification announced last week.

"[This] is the spec we feel we can hang our hats on for years to come," said Chuck Berman, director of market development at McCaw Cellular Communications, Inc.

CDPD, a digital overlay to the analog cellular voice network, lets users send short packets of information without being connected to a phone line. The new CDPD specification will improve interconnections between the various vendors that run the networks, which will lower costs, boost performance and expand functionality.

Users contributed heavily to CDPD System Specification 1.1, Berman added. It will be rolled out in mid- to late 1995.

McCaw is a member of the CDPD Forum, Inc., an industry umbrella group that sets the CDPD specification. Recent requests from potential large users were given heavy weight, Berman said.

The new protocol was also shaped by the humbling experience of the current specification's slow rollout.

"Costs need to come down before users will embrace this network," said Gib Hoxie, executive vice president of The Pacific Group, a Santa Clara, Calif., consultancy.
Keeping pace with Computer Associates

Chairman and CEO Charles B. Wang sounds off on customer relations, ASK and Unicenter

Two weeks ago, Computer Associates International, Inc. did what it has done regularly for nearly 20 years — posted eye-popping quarterly financial results. Revenue for CA's third quarter, ended Dec. 31, rose 20% from the previous year. Profit grew 40%, to $174.2 million.

Computerworld senior editor Thomas Hoffman caught up with Charles B. Wang, CA's chairman and chief executive officer, last week.

CW: CA's numbers have been very strong for the past several quarters, yet many people in the industry continue to show amazement at CA's continued success. Why do you think that is?

Wang: Everybody's got these wonderful spreadsheet models — goddamn spreadsheets, I tell ya — and they [industry gurus] don't know how to sell at a company that doesn't fit it. I look at software as software.

CW: Until recently, there were analysts who still didn't know what CA's client/server strategy was.

Wang: It's certainly a reflection of our inability to get the right word out. [But] to do $300 million in [client/server] revenue in 12 months, I wish I had more products that weren't so clear to everybody.

CW: Let's talk about the ASK Group, Inc. acquisition. Some ASK users were skeptical of CA's intentions with the products, believing that CA might just plunder the products for their revenue.

Wang: I defy you to look at any of the products we acquired. If anything, we've added more value than any of those companies could have done on their own. Number two, don't forget that this was our first big Unix acquisition. We don't have a base there. Most of these [ASK] users don't know CA.

CW: Yet the retention rate of ASK customers has been high?

Wang: I don't think I've lost any. There was one, the Royal Air Force. They did a letter of intent with ASK and, yes, Infinix got that because there was a huge fight internally. I'm not going to get into that.

Charles Wang says CA added more value to the products it acquired than the previous owners could have on their own.

CW: How would you characterize the reaction to CA's flexible licensing options introduced in 1992?

Wang: We are signing the large [customers] and publicizing those. Maybe we've converted 25% of the base. All I ask of customers is a commitment longer term. I'm not asking [users] for more money.

CW: Well, in the three years since you laid the foundation for alternative licensing, has CA made any revisions to the ways these licenses are constructed?

Wang: Constantly.

CW: Are they done on a customer-by-customer basis?

Wang: No. And that's why we publish it. We're just now in the process of introducing user-based pricing for our business applications [such as CA-Masterpiece/2000].

CW: Clearly there's been a dramatic shift in customer attitudes toward CA's support, service and pricing in the past few years. Was there a conscious decision three years ago to start treating your customers differently?

Wang: Absolutely. We didn't have relationships with customers. We sold them products. So we took our sales force, basically cut it in half and installed service reps who do nothing more than build relationships. That's probably one of the biggest gambles I've taken at CA.

CW: Many customers felt alienated during CA's legal battles with EDS.

Wang: When we got together with [EDS'] Les Alberthal and Gary Ferandes, it was scary in the sense that we had been so stupid to let lawyers run the show. We became prisoners of bullshit. And we both should have known better because [lawyers] try and bill by the hour.

CW: Despite the financial success of CA-Unicenter, there have been dramatic changes to the product line in the past year, such as price slashing and the Simple Network Management Protocol support that's been added. Were these changes based on customer feedback?

Wang: Customers did say that they wanted the [Unicenter] prices cheaper, so yes, that was a recognition. And there's so much more to come.

CW: Such as?

Wang: Exciting stuff. We're working very closely with the network management providers, particularly the two major ones, [Hewlett-Packard's] OpenView and [IBM's] NetView. We're also putting Unicenter on top of Ingres.


Let's make a deal

CONTINUED FROM PAGE 1

major project before he left his post as chief information officer at American Cyanamid Co. last June, he said.

Peter Winter, consulting maintenance and support of 10 Oracle databases running on various machines down to three primary site licenses, American Cyanamid in Wayne, N.J., expects to save $200,000 in the next three years, Zeitz said.

Out with the old

In general, users should try to shake vendors out of old thinking. The historic model of 15% to 25% of software license fees for maintenance "is really just an arbitrary, black art kind of arrangement," said Arthur Fakes, an attorney in Lombard, Ill., who specializes in negotiating software contracts.

Percentage-based maintenance often "becomes a revenue-generating mechanism for vendors that does not always correlate to the value received by the customer," according to the Society for Information Management, which recently published a white paper on software licensing.

In some cases, users are beginning to channel frustration borne of high price tags into negotiating leverage, said Mike Fisher, database manager at Medical Inter-Insurance Exchange. The malpractice insurance firm in Lawrenceville, N.J., was recently able to talk Oracle into a deal to hold maintenance costs steady, even though the exchange added new products to its shop, Fisher said.

One method to save on support that has gained ground in the past 10 to 12 months is the per-call approach, according to Fakes. Instead of shelling out dollars based on a straight percentage of license, users pay a set amount of money each time they call a vendor for support. Often, a monetary ceiling as well as a floor are attached to the agreement.

"I've seen it used with success at some very large U.S. companies, mainly in the Fortune 200," he said.

American Express Co.'s IS group in Phoenix typically demands, and gets, options that other user firms do not, Fakes noted. American Express officials declined to comment on negotiation tactics. Other notoriously tough user firms include Citibank NA and Texas Instruments, Inc., he said.

The per-call technique is also gaining steam as an option fastened to traditional percentage-based deals. The reasoning? New software has a life span. So it may be OK to pay higher fees for maintenance when the software is new and relatively unstable in the first year or 18 months, for instance. But as bugs are worked out and expertise in caring for the software grows, continued high maintenance can be unfair.

"Think about the difference in service that 18% or 20% gets you in Year 1 vs. Year 4," said Howard Rubin, a consultant at Computer Associates International, Inc. in Poundridge, N.Y. "You probably don't want to continue paying that much if you're comfortable with the product."

Dangers exist, though. Per-call support can become expensive if users cannot reasonably predict how often they will need help. Rubin pointed out. He likened the situation to buying an extended warranty on a video camera. "You don't know if it's worth the $100 until you understand the typical frequency of repair in your camera's history," he said.

Playing the game

While the knees of industry leaders, such as Computer Associates International, Inc., IBM or Oracle, typically jerk when customers broach such new ideas, the younger, scrappier vendors are more willing to deal, users and consultants said.

Observers cautioned that the merit of — and savings from — these new deals differs case by case. Yet they agree that maintenance is ripe for rethinking.

As Frank Cooper, a consultant at International Computer Negotiations, Inc. in Coral Springs, Fla., said, "It's one area where there is definitely fat in the price that can be negotiated out."
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The war is over. No more howitzer shells coming at client/server groups from the glass house. No more client/server people lobbing grenades at the MIS staff. Not that peace is always as peaceful as you’d like it to be. Networks going down, bottlenecks popping up, people screaming about applications they can’t get to. And a nasty feeling that nobody is really doing anything to help you with any of it. When, in reality, all of us at Legent are doing quite a lot. We’ve put together the most extensive set of industrial-strength, distributed systems management tools available. We’ve also developed an open architecture called XPE™ that lets our software work together across almost anything you can wire together, regardless of function or platform, from mainframes to UNIX servers to PC LANs. Which means you can manage your systems from the platform of your choice, something our customers tell us they’re happily doing right now. It’s not a silver bullet, but it can definitely help you do your job better. Besides, it’s peacetime. Who needs bullets?
HP's OpenMail seeks identity

By Suruchi Mohan

Hewlett-Packard Co.'s OpenMail may be the best messaging system on the market, but it is sorely lacking in name recognition.

And some analysts said they suspect the Palo Alto, Calif., company's ineptitude in marketing OpenMail may have caused it to miss an important window of opportunity afforded by Microsoft Corp. and Lotus Development Corp., which are both late with their messaging products. Lotus has yet to move beyond the talking stage in delivering a stable client/server messaging product.

"HP has a big market today for OpenMail as a server," said Tim Sloane, an analyst at Aberdeen Group in Boston. However, he noted that time is running out for HP as Microsoft's Exchange server and Lotus' client/server model of CC:Mail move closer to the finish line.

"OpenMail is HP's best-kept secret," said Bob Jull, president of LinkAge Office Information Solutions, Inc., a value-added reseller in Toronto. Although the product is based on excellent technology and customers are pleased with its capabilities, it has not met its sales potential, Jull said. Because the product is essentially a server, the sale is always a protracted affair because it is a system, not a product, he said. System sales are usually prolonged.

Mixed message

HP does not see itself as a server provider, however. It is positioning OpenMail as a messaging backbone that is capable of connecting several disparate systems, according to Raul Mujica, a product line manager at the company.

So while the OpenMail group within HP positions the product as a backbone, "the HP sales force is out selling it as a mail product," Sloane said.

Hence the confusion. The company has not been able to get a consistent message across the marketplace.

OpenMail targets Fortune 500 companies that need to connect heterogeneous systems, Mujica said. But HP's servers connect well to form a backbone in a relatively homogeneous, not heterogeneous, environment, Jull said.

"Where there are 10 systems that want to connect, it's still SoftSwitch. Where it's just a couple of systems that need a strong server, that's where HP is," Jull added.

Under what terms?

When HP signed an agreement with Lotus in November 1994, it was not clear to users what role HP would play. The message from the two companies was muddy. In fact, for a while the industry widely speculated on the future of OpenMail and whether it was conceding the messaging market to Lotus.

But what HP was conceding was only the groupware market. According to the agreement's terms, HP would sell Lotus' Notes on its 9000 Series 900 HP/UX platform. The two companies would still continue to develop their own messaging strategies.

For users employing OpenMail, HP's decision not to enter the workgroup computing sphere raised some interoperability issues, Jack Powell, manager of networks and desktop support at Mobil Exploration and Producing Technology Center in Dallas, wanted to use workgroup applications such as calendaring. He said he wonders whether HP's system is truly open.

Whatever happens to HP OpenMail as a client/server product — and not as a backbone — will depend largely on the success of Exchange and the Lotus product. "If Microsoft and Lotus are successful, HP will be limited to customers who want an integrator, not [a] vendor," predicted Dan Blum, principal at Rapport Communications in Silver Spring, Md.

"Marathon buys one of these every month"

"We were skeptical about the savings. Even after we saw a live demonstration, we didn't think Marathon could save our classic Corvette dealership all that much money. But we figured we'd save at least enough to pay for the equipment and then keep some savings each month. So we installed a MICOM Marathon Data/Voice Network Server in our Saugus Massachusetts showroom and another in our new Pompano Beach, Florida facility.

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And, since it’s all managed by Sprint, the network can expand with Blockbuster’s business — without the need to retrain personnel or change systems.

Which leaves Blockbuster free to do what it does best: Keep the world entertained.

Now, if we can do this for Blockbuster, imagine what we can do for you. To find out more about Managed Network Service and how Sprint can help your business do more business, call us today at 1-800-669-4700.

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With the Windows NT-based system, CareLine dispatch centers can handle more calls with the same number of people. Distributed computing cuts downtime (and enhances productivity) by allowing workstations to stay up. Even when servers go down. Powerful database and reporting features, using Microsoft Office and development tools, make problems easy to identify. And with standard PCs as clients, the system is highly scalable.

Walter Arndt is Senior V.P./C.I.O. at CareLine. "We’ve shortened response times while cutting costs, and our people are working more efficiently on a system that’s incredibly easy to use." To get more information about how Microsoft can help turn computer challenges into a business advantage, call (800)437-3119, Dept. E6C. Or contact us at GO BIZSOLN on CompuServe®

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This system was implemented and supported by American TriTech, a Microsoft Solution Provider, and backed by Microsoft’s mission-critical Product Support Services.

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Business units, IS benefit from sharing ideas

By Thomas Hoffman

NEW YORK

Before Mobil Research & Development Corp. makes any R&D decisions, it gathers information from a critical resource:

"Typically, when we had an important event coming up, we would rely on a mailing to our own database as the prime vehicle for getting the information to the people we had targeted.

This time, with our Enterprise Application Development & Executive Strategy Conference, we knew we had to have a marketing approach that would jump-start awareness for the conference and educate the audience on Hewlett-Packard's Enterprise Application Development Program. We really felt we needed to create our own publication. A piece tailored to deliver information of real value to the customer. That, if they’re building a business-critical application, the best platforms for their development are the HP 9000 Workstations and Servers. Another important consideration was using a publication with a very broad-based appeal in the information systems arena. That’s Computerworld. We know, because we asked our customers. As a result, here we are months later, and we’ve still using several thousand reprints of the custom publication as a sales tool for the field, in a customer-deliverable format. It worked very effectively in creating awareness of the conference and building preference for Hewlett-Packard programs."

“My goals were to create awareness and build a preference for Hewlett-Packard in application development. The custom publication we created certainly did that for us.”

Roberta Anslow
Program Manager
Hewlett-Packard Enterprise Application Development

Business units, IS benefit from sharing ideas

Full text: [Link to the full text of the article]
INTRODUCING pcANYWHERE ACCESS SERVER. NOW YOU CAN SET UP YOUR REMOTE USERS WITHOUT EVER LEAVING YOUR DESK.

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THAN HP'S T500.

RM600 64-Bit UNIX Server
Info-terrorists
CONTINUED FROM PAGE 1

"The technology is real. The capability is real," said Winn Schwartau, executive director of Interspace, a computer security consultancy in Seminole, Fla. "What has gone underrecognized is the ability to use these open source weapons to create a massive attack."

Consultant Paul A. Strassmann, the Pentagon's former director of defense information, said, "If you are a responsible company official, and you conclude that an attacker might use a HERF weapon, you have an ethical obligation to put a database with glass windows facing a busy highway may be a foolish act."

Schwartau lectures on information warfare at the National Defense University in Washington. Corporate preparedness to deal with information warfare is abysmally low, experts agreed. "The bottom line is that the capability of the offense now exceeds that of the defense," Strassmann said. "A very small number of knowledgeable info-bandits can totally overwhelm very entrenched and expensive defenses."

No stranger to the Pentagon
The U.S. is known to have top-secret electronic weapons, and it reportedly used them extensively with devastating effect against Iraqi communications during U.S. forces' assaults on Kuwait City. Unfortunately, according to experts who have studied the technology, it does not take a rocket scientist or a billion-dollar defense contractor to build a nastily effective piece of destructive cyberware.

These devices are just one source of danger to companies approaching the 21st century, experts agreed. Internet bulletin boards and underground publications such as "2000 - The Hacker Quarterly" are filled with advertisements for weapons. These include $100 libraries of computer viruses, electronic boxes built to trick telephone systems, $29 password "sniffers," spy equipment and free advice for the info-terrorist. "Info-assassin paraphernalia is booming, and it's gory stuff you can buy," Strassmann said. "The problem has nothing to do with U.S. industry. He said chinks in corporate armor result from flawed policies and procedures. "The problem has nothing to do with technology and everything to do with organization," he said. "The defenders are not organi- zed against professional attacks."

L aw enforcement and security experts bemoan the lack of public discourse on the threats of information warfare. "And the result is unwarranted user complacency," he said. "If you take the position that danger is based on relative ease and high payoff, then clearly you have to say the technology is real. The capability is real," said Paul Strassmann, a former CIO for a Seattle manufacturer, I'd have to worry more about mundane things such as theft of corporate secrets."

"You have to take [electromagnetic weapons] seriously because the capability exists," Pastore said. He refused to say whether Capital One had taken any preventive measures against the device.

For the most part, however, users said they were skeptical of the danger from HERF guns and the like. "I don't see the risk for us," said Phyllis Unger, director of data processing at Rolls Royce Canada Ltd. in Lachine, Quebec. "As a manufacturer, I'd have to worry more about mundane things such as theft of corporate secrets."

"Yeah, we've thought about it, but I can't say it's the sort of thing that comes up at every board meeting," shrugged Dominique A. Varvaro, supervisor of programming at CAE Electronics, Ltd. in St.-Laurent, Quebec. Many foreign countries and corporations see cyberspace as an electronic gold mine where it is possible to operate anonymously and with relative ease and high payoff. "Do not assume threats are primarily from a ragtag band of hackers," said Michel Kabay, an information security specialist at LOS Group, Inc., a systems consultancy in Montreal. "At the intercorporate level, I foresee that it will be irresistible to those who are unscrupulous to cause damage to competitors through attacks on information systems."

"The end of the Cold War has boosted industrial espionage," added Maj. Gen. Alan Pickering, director general of information security at the Communications Security Establishment, Canada's equivalent of the National Security Agency. "Why pay for information when you can steal it?" Pickering asked, noting that there are 57 countries known by the FBI to have established formal programs for sputting on Silicon Valley companies.

Billions down the drain
Indeed, The Wall Street Journal recently reported an accusation by Texas Instruments, Inc. that France's Compagnie des Machines Bull had developed a chip based on secrets stolen by a Bull employee sold at TI. A spokesman for Bull last week that the case had been settled out of court and declined to comment further.

"Corporations are losing billions through electronic theft," said Robert Steele, president of Oakton, Va.-based Open Source Solutions, Inc., a nonprofit foundation that has lobbied the government to strengthen national information security. "IS managers today are like housing developers selling houses with leaking roofs, no windows, no doors and no alarm systems."

Steele said risks to companies include theft of proprietary information, deliberate sabotage of mission-critical systems by investors who have sold short a company's stock and sabotage by disgruntled employees. He said the problems are not better known and understood because companies virtually never talk about security breaches, fearing public embarrassment and shareholder lawsuits (see story below).

Strassmann rejected the calls by some at the Montreal conference for the government to share its information warfare defense secrets with U.S. industry. He said chinks in corporate armor result from flawed policies and procedures. "The problem has nothing to do with technology and everything to do with organization," he said. "The defenders are not organized against professional attacks."

The dangers of complacency
Computer Security Association in Carlisle, Pa., said he favors the establishment of national data banks of computer security breaches to which corporations and government agencies would be required to report incidents. Names of victims should be kept confidential, he said.

Information warfare specialists are keenly aware that they are seen as Chicken Littles by some in the military establishment. "It may be too early to bring company executives into this. If we move too quickly, we will turn them off," said Maj. Gen. Alan Pickering, a Canadian information warfare expert.

"I'm constantly challenged — 'Who's been hit? Show me the risk.'"

Yet Pickering and other experts insist that anyone who dismisses threats as just because they cannot be documented with extensive case histories is living in a fool's paradise — and sitting on a time bomb to boot. "If you take the position that danger is based on potential, then clearly you have to say we are just lucky or stupid," said Paul Strassmann, a former CIO and military expert. — Gary H. Antche
"PCs have all the same feeds and speeds. They’re a commodity."

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Israel aims to export high-tech expertise

IS suppliers renew push for overseas presence

By Paul Gillin

Having established diplomatic ties with former enemies, the state of Israel is turning its attention to another daunting challenge: building mind share in the U.S. computer market.

Israel's high-tech executives hope to strike while the iron is hot. The end of the Arab boycott has loosened some countries' long-standing policies against doing business with Israel. The first-ever delegations from Jordan, South Korea and Japan were kicking tires at the Israel Information Processing Association show earlier this month, and "all the major Israeli companies are coming to investigate," Israeli technology said Hanach Ashaf, managing director at Motorola Israel Ltd. in Tel Aviv.

Small giants

But the small size of the Israeli market -- in which a $150 million company is a comparative giant -- has been a hindrance to Israeli ambitions. The country faces a dilemma: It has ample intellectual capital to export abroad but little money to do so.

"It's definitely not a smooth [process]," said Peter Barber, senior vice president at Durham, N.C.-based Sapiens USA, Inc. And even then, "We didn't come here until we had established a fairly strong relationship with a VAR who could support us -- in this case, IBM," he said.

Israel companies are not new to the IS community: Firms such as Scitex America Corp., Sapiens and Fibronics International, Inc. are well established in the U.S., and more than 50 Israeli companies are traded on U.S. stock markets. But there is a renewed push by the $4.6 billion Israeli electronics industry to build an overseas presence.

The government is prodding the effort with encouragement and money, although the amounts are modest. Promises of building a sales force, turning its attention to another daunting former enemies, the state of Israel is turning its attention to another daunting challenge: building mind share in the U.S. computer market.

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- 88. Sys. Integrators/VARs/Consulting Management
- 97. President, Owner/Partner, General Manager
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- 137. Other

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- App. Development Products
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  - Yes
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Lotus reports loss
Lotus Development Corp. reported a loss of $20 million for its fiscal year 1994, compared with a $55.5 million profit in 1993. The Cambridge, Mass.-based developer also announced a $14.4 million profit for the fourth quarter, ended Dec. 31, a 51% drop from the $29.6 million profit reported for the same period in 1993. Revenue for the quarter declined from $278.3 million in 1993 to $294.5 million. The company attributed the decline to reduced DOS business and competition from Windows suites.

Unisys takes a hit
After taking a $196.2 million pre-tax charge to cover the elimination of 4,000 positions, Unisys Corp. reported a loss of $52.2 million for its fourth quarter, ended Dec. 31. Excluding the special charge, the computer maker earned income of $90.8 million in the quarter. Revenue increased slightly to $2.12 billion, compared to $2.1 billion for the same period last year. Total revenue for the year was $7.4 billion, essentially flat from the $7.42 billion reported last year. Unisys reported net income of $100.5 million for the full year.

Gupta loses $23.9M
Gupta Corp. in Menlo Park, Calif., blamed high sales and marketing costs for the $23.9 million loss reported last week for its fiscal year 1994. In 1993, the company reported a $5.6 million profit. However, revenue rose from $80.1 million in 1993 to $86.4 million in 1994.

SHORT TAKES
Rational Software Corp. in Santa Clara, Calif., has acquired Palladio Software Corp., an object-oriented tools developer. ... Harbinger EDI Services, Inc. in Atlanta bought Texas Instruments, Inc.'s electronic data interchange business unit. All affected TI employees will stay on with Harbinger.

IBM comes out on top in 1994
Amdahl also reports bulky fourth-quarter profits while StorageTek, Stratus fall

By Craig Stedman

Forget for a moment about IBM's troubled PC business and you could almost festoon the computer giant with a jugernaut label. Even if you put IBM PC Co. back in the picture, IBM's string of five straight profitable quarters has helped back up the confidence level of some big customers.

IBM in Armonk, N.Y., came out at the high end of Wall Street forecasts once again in the fourth quarter of 1994, giving it a grand slam for the year. Last week, the company reported a $1.2 billion profit on revenue of $19.9 billion for the quarter, earning the continued praise of users and analysts.

"I don't know if you can say for sure that IBM has turned things around, but they're sure looking a lot better than they were a year ago," said Wayne Pattinson, director of data center operations at Kansas City Southern Railway Co. in Missouri.

User confidence rises
George Sekeley, president of the information systems unit at CSX Corp. in Richmond, Va., said he also likes IBM's performance. "I have confidence now that they've found a way to get out of the hole that they got themselves into," he said.

IBM's fourth-quarter profit was three times better than its 1993 figure of $382 million, and revenue grew 7% after adjusting for the sale of its federal division. For all of 1994, revenue increased 6%, to $46.1 billion, and IBM had a net profit of $3 billion. That compares with a 1993 $8.1 billion loss.

Mainframe revenue continued to hold up better than expected, falling less than 10% in 1994, IBM said. The AS/400 midrange line rebounded after several flat years, and the RS/6000 had strong double-digit growth. The PC Co., however, had only a 7% sales increase and was unprofitable.

The PC Co.'s results were described as "disappointing" by Jerome York, IBM's chief financial officer. "This is one-sixth of our business, and it's under-performing materially," he said. An ongoing restructuring at the PC unit will not be completed until midyear, he added.

IBM this year has to show that it can still successfully merchandise PCs, said John Jones, an analyst at Salomon Brothers, Inc.'s San Francisco office. Nonetheless, for the fourth straight quarter, Jones has raised his 1995 profit forecast for IBM as a whole.

Amdahl Corp., one of IBM's mainframe brethren, also reported strong fourth-quarter results due to better-than-expected big iron sales. Amdahl in Sunnyvale, Calif., had a $40.9 million profit on revenue of $48.8 million, compared with a $40.9 million loss and revenue of $44.2 million a year ago.

Not so fortunate was Storage Technology Corp. in Louisville, Colo. StorageTek's fourth-quarter profit of $29.1 million was a big increase over the $6.3 million figure from last year, but it fell well short of expectations due to low sales of its Iceberg 9200 mainframe disk array.

Stratus Computer, Inc. in Marlboro, Mass., also reported disappointing results, with sales of its fault-tolerant systems up just 2%. It also said 1995 revenue would be flat with 1994 levels or down slightly. Stratus and StorageTek were hit with big stock price declines after releasing their numbers.

Information highway
Microsoft readies on-line net strategy

By Ellis Booker

Microsoft Corp.'s impending entry later this year into the online network business has already begun to affect the online industry.

While The Microsoft Network will not be available until the much-delayed Windows 95 operating system ships in August, "it stands to be a sledgehammer if they get just 3% of all the Windows 95 users online," predicted Jayne Levin, editor in chief of the "Internet Letter" in Washington.

Windows 95 is expected to sell 20 million to 30 million copies in its first year. However, Microsoft is not commenting on the potential traffic, the pricing scheme or the content providers of the network. But sources say it will be launched as an X.25 service, with TCP/IP connections to the Internet expected to be added by the end of the year.

Sources indicate that Microsoft expects to sign up 2 million users initially, scaling to 20 million well before the end of the decade.

The power of Microsoft
Meanwhile, Micro-
soft has been busy forging strategic alliances.

Bill Gates, Microsoft's chairman and chief executive officer, announced recently that UUNet Technologies, Inc. in Falls Church, Va., will build a dedicated TCP/IP network through which Microsoft Network subscribers will access the Internet via Integrated Services Digital Network (ISDN) lines. The network will support modem speeds of 14.4 K to 28.8 K bit/sec.

"One fell swoop, Microsoft will do more for ISDN than the telephone companies have done in 10 years," said Don Gooding, a partner at Acel Partners in Princeton, N.J. Microsoft also licensed the code for the Mosaic graphical browser from Spyglass, Inc. in Sunnyvale, Calif.

Glass is the developer of En- hanced Mosaic, a commercial-grade version of the browser developed at the University of Illinois.

And earlier this month, Mi-

crosoft licensed a text-retrieval engine from Fulcrum Technologies, Inc. in Ottawa for enabling managers to navigate through content on the service.

There is a general consensus that Microsoft's addition of Internet connectivity via its Net-
work will push the Internet over the top and into the main-
stream.

But other players are not rolling over and playing dead. The proprietary on-line networks — led by Prodigy, which announced a browser for the World-Wide Web earlier this month — are rapidly deploying Internet connectivity and browsers.
WHERE DO I WANT TO GO TODAY?

I WANT TO GO HOME,
SOMETIMES BEFORE
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LIKE MY WORD
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PITCH IN A
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**Viewpoint**

**More sensitivity to women needed**

Having just read *Computerworld*’s Forecast issue [CW, Dec. 26-Jan. 2], which looks at “how far we have come in the past 12 months,” I found myself frustrated by the scarcity of women featured. Feeling that undue sensitivity on the subject was affecting my judgment, I decided to analyze the incidences of male/female images in this issue.

Of 103 human images, 87 are male (84%), and 16 are female (16%). These numbers break down as follows: 88% to 12% in the main text; 70% to 30% in the advertisements; and 96% to 4% in the graphic illustrations.

The fact that the numbers in the advertisements are slightly more balanced indicates that perhaps your advertisers have a better appreciation of the importance of women in the computer industry than does your editorial staff.

On behalf of the female members of the information technology industry, could I ask that you please address this issue by showing more sensitivity toward a group that is no longer a minority?

*Pamela A. Gray*

*Mill Valley, Calif.*

**Intel misled users with false claim**

Mitch Bets laments that there are no “well-vetted algorithms,” and he suggests computer buyers start asking vendors harder questions and demanding more rigorous testing and validation of the algorithms embedded in microprocessors and software (“Pentium flaw joins long list of computer math mistakes,” CW, Dec. 19, 1994). No one I have ever known who has depended on numerical calculations has naivey believed that the calculations done by their computers are absolutely correct.

However, when a vendor states that its processor is IEEE-compliant, it is saying the errors are absolutely predictable — not that there are no errors. Intel said its chip was IEEE-compliant and continued shipping it for several months when it knew this was not the case. IBM needs a visionay focus that leads to the development of new and widely accepted software applications, such as workflow, office, image processing, multimedia, personal finance and networking. Additionally, its software approach requires programs that use lots of productive MIPS, work together harmoniously and support IBM’s operating environments. More simply stated, it must emulate Microsoft’s strategy for the Windows operating system.

*Robert Wintermeier*

*Groton-on-Hudson, N.Y.*

**Time to change**

Regarding “Big Blue deja vu” [CW, Jan. 16], IBM’s frequent reorganizations have always reminded me of a palm tree swaying in a storm. With every reorganizational gust, a few coconuts fall from the top, but nothing affects its firmly planted roots where the employees continue to nourish the rest of the tree.

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*Franklin H. Williams Jr.*

*Salt Lake City*

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I was pleased to see the coverage you gave to the Oncolink matter in “Unplugged Internet board incites debate” [CW, Dec. 19, 1994]. In the article, Daniel Doni quoted as saying: “At the moment, the Internet is one of the world’s largest homes of freely available information, but much of it is also inaccurate and out of date.”

As a cancer survivor and a frequent visitor to Oncolink, I have always found Oncolink material to be the most accurate and up-to-date information source available, not to mention comprehensive and convenient. Oncolink is truly an invaluable resource. I hope it remains so.

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**Viewpoint**

**Open season on CIOs**

Michael B. Cohn

CIOs, beware of footsteps. Hide under your desk. It's open season on information systems executives, and you may be the target.

Today's chief information officers are moving out or up at an alarming rate. A handful climb into the boardroom, the rest race riotous mobs of users to the parking deck.

Fact is, every 30 minutes in corporate America a CIO is fired, demoted or made fun of. The job is cruel, brutal and thankless and requires resilience and dedication found only in such pillars as major league baseball negotiators.

CIOs, you need to know where you stand. Are you on thecutting edge of corporate technology or just six figures waiting to be siezed? Should you think about a raise or work on a resume? It's time for a gut check. Just take the following test, run the answers by your CEO, and hope, with fingers crossed, that at least you keep your job.

You may begin

Which of the following describes you?

1. You have read about client/server technology and are trying to understand it.

2. You purchase equipment from multiple vendors. You purchase equipment from just one vendor and hope it learns your business. You purchase equipment from just one vendor and pray it stays in business.

3. Your chief financial officer will still demand you get off the desk. It's open season on information systems executives, and you may be the target.

4. You read 20 hours a week to stay technically credible.

5. You repeat buzzwords in meetings to appear technically credible. If you could still do something technical it certainly would be incredible.

6. You're meeting board members' objectives occasionally.

7. You won't let users develop desktop applications but will let you cool with water.

8. You purchase equipment from just one vendor and pray it stays in business.

9. You are not vendor-independent because companies will find partners not just by offering discounts but by sharing information about themselves and sharing their wisdom.

10. You are totally vendor-independent because your employees out in the electronic world.

The CEO is "rightsizing" and looks forward to your full cooperation.

The CEO is "rightsizing" and looks forward to your empty desk.

The CEO is "rightsizing" and looks forward to your full cooperation.

You let users develop desktop applications but nothing over 16 bits unless accompanied by a parent. You let users develop desktop applications as long as they practice safe specs. You already have 4GL systems. You are finishing a three-year conversion to 4GL systems.

CONCLUSION: You are still finishing a four-year conversion to 3GL systems.

You are not vendor-independent because you run proprietary software.

You are partially vendor-independent because you run open systems.

You are totally vendor-independent because vendors go around you and talk to the CPO.

Cohn is author of the humor book _Four of Computers_ and is trying to stay employed at a large company.

**The virtual, visible corporation**

**Esther Dyson**

What do many annual reports list as their company's greatest asset? People and partners, not computers or reusable code. In the new world of instant global communications a lot of things will change. Everyone knows about flatter organizations, virtual corporations, telecommuting and the like. But how does the new age play out in the _texture_ of corporations as opposed to structure?

The short answer is that companies must become more visible. More of what any company sells will comprise information — whether it's plain data, news and analysis, technical support, consulting services, design services, interactive entertainment or competitive intelligence. All of these influence the nature of physical products. Some people will sell products; others in the chain will add value.

Of course, there will be contracts between supply and customer, but in a knowledge-based world, the quality of those relationships will matter more than the contractual conditions — as in marriage.

You take the case of Microsoft in Europe, where the company sells (as it does in the U.S.) through a network of dealers, value-added resellers and consultants that don't actually sell software products but guide customers' purchase decisions.

At a recent industry conference in Paris, Microsoft Europe President Bernard Vergnes spoke openly about changes in Microsoft Europe's structure and strategy. He admitted to a few mistakes and described the division's aims for the next year or two. He did all this plainly and straightforwardly, as if talking to an internal sales meeting — the informational, not motivational, part.

Most of the people in the audience were dealers, but not all had a particular relationship with Microsoft. But it didn't matter: by sharing information with them, Vergnes made them feel like partners. Even companies that have no contractual relationship with Microsoft are more likely to recommend its products if they feel they understand not just the products but Microsoft itself.

The best cement for a virtual corporation is a two-way flow of information — or visibility. Companies will find partners not just by offering discounts but by sharing information about themselves and sharing their wisdom.

There is no choice. Visibility isn't just outsiders peering in; it's your employees out in the electronic world. They are the company. As the value of products diminishes, the outside world's interactions with your people will be what you sell. The quality of the interactions you foster will be what draws employees to your company.

Furthermore, what matters will influence and feel involved in decisions their partners make even though companies will not necessarily allow outsiders to participate in or view the decision-making process. By not being transparent but also allowing two-way interaction, such companies will in fact make better decisions.

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You'll get a world of work done as you streak across the Atlantic. While those two-hour laptop guys around you are eventually left to eating peanuts and reading the safety instructions for the fifth time.

And for you power mongers out there, we even offer a 100MHz Dell Latitude XP for just $4199. So call today to order these long-lasting Dell Latitude XP or Dell Latitude notebooks.

And let the people at your office check them onto their next transatlantic flight.

So then, when they finally touch down on that blessed plot, they'll have a notebook with plenty of juice left to do that expense report.

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Mt. Everest climbers take technical route

Notebook computers will track progress

By Michael Fitzgerald

Why surf the Internet from the summit of Mt. Everest? Because you can, of course.

Cruising the Internet from the top of the world is quite a feat, even for Steve Reneker, a 13-year information systems veteran who will set as facto chief information officer on the ’96 American Mt. Everest expedition that kicks off March 1.

Reneker hopes to bring technology to the top of Mt. Everest

Because organizers already planned to bring computer equipment for research purposes, electronic mail from Everest seemed eminently achievable.

"We've got high hopes. We've been long-time supporters of the expedition," said Bruce Stephen, an analyst at Dataquest, Inc. in San Jose, Calif.

Where the upgrades are

At the moment, the biggest upgrade market lies in the vast installed base of 486-based systems, said Steve Reynolds, an analyst at Dataquest, Inc. in Hampton, N.H., suggesting that as prices continue to fall, users may be tempted to buy new systems instead of recycling older ones.

AST steadies notebook offerings

By Michael Fitzgerald

After a lackluster 1994, AST Research, Inc. is starting 1995 with an effort that may signal the end of its up-and-down performance in the notebook market.

The Irvine, Calif., company recently introduced the Ascentia 810N, a value-class corporate notebook that should give AST a temporary technological lead in the market. Corporations use value-class notebooks when they do not need or cannot afford a cutting-edge laptop but still want a full-feature notebook.

The 5.9-pound Ascentia 810N has a 10.4-in. passive-matrix color screen, a 66-MHz Cyrix Corp. DX2 486 chip and a second battery option. Its base price is $2,499.

According to figures from International Data Corp. (IDC), AST remained fifth in unit share of the U.S. notebook market in 1994, behind Toshiba America Information Systems, Inc., Compaq Computer Corp., IBM PC Co. and Apple Computer, Inc. But Apple's market share and faces pressure from competitors such as NEC Technologies, Inc., and Texas Instruments, Inc.

A good start

"AST had an off year in portables last year, and they needed to come out with guns blazing this year. This is a good start," said Bruce Stephen, an analyst at IDC in Framingham, Mass. "AST needs to build on this start and attack the competition, he said.

AST officials said they have a window to establish themselves in the value-class market. According to Stephen Andler, AST's director of portables marketing, the company has picked a larger screen and a faster (and cheaper than Intel Corp.) chip so it can at least get a short leg up on the competition.

"We're trying to give everybody a new definition of value," Andler said. "Our product is priced below some people's [50-MHz] DX2 systems, and we have a 10.4-in. display where everybody else has a 9.1-in. display.

But Stephen and other industry analysts said they expect to see a series of pitched fights in the value end of the corporate notebook market this year.

A number of feature sets now found in high-end notebooks should move into the lower-priced middle range of the market, they said.

Intel shifts into Overdrive

By Jaikumar Vijayan

Intel Corp.'s efforts to move the market to Pentium upgrade processors, the chip is expected to provide a cost advantage to its sales-based systems with a bridge to Pentium performance at a price point that Intel hopes will be low enough to evoke interest.

The chip will sell for a suggested list price of $449 and speed up 146-MHz SX20 and 25-MHz 486-based systems to 63-MHz, Pentium performance — or roughly 2½ times the current speeds of these processors. An 86-MHz version of the chip that will upgrade the 66-MHz DX2 and 63-MHz 486 processor will be available by midyear, Intel said.

At the same time, the Santa Clara, Calif.-based company also rolled back prices on existing DX2 and DX4 Overdrive processors by as much as 45%.

That kind of bait may be necessary to lure customers to upgrade, analysts said. The announcements come at a time when Pentium and 486 processor prices have been falling rapidly, which could dampen interest in upgrading.

"A year from now, users can get twice the performance they are getting today for the same amount of money," said Jennifer Munson, an analyst at WorkGroup Technologies, Inc. in Hampton, N.H., suggesting that as prices continue to fall, users may be tempted to buy new systems instead of recycling older ones.

Pentium processors

By Jaikumar Vijayan

Intel Corp.'s efforts to move the market to Pentium upgrade processors, the chip is expected to provide a cost advantage to its sales-based systems with a bridge to Pentium performance at a price point that Intel hopes will be low enough to evoke interest.

The chip will sell for a suggested list price of $449 and speed up 146-MHz SX20 and 25-MHz 486-based systems to 63-MHz, Pentium performance — or roughly 2½ times the current speeds of these processors. An 86-MHz version of the chip that will upgrade the 66-MHz DX2 and 63-MHz 486 processor will be available by midyear, Intel said.

At the same time, the Santa Clara, Calif.-based company also rolled back prices on existing DX2 and DX4 Overdrive processors by as much as 45%.

That kind of bait may be necessary to lure customers to upgrade, analysts said. The announcements come at a time when Pentium and 486 processor prices have been falling rapidly, which could dampen interest in upgrading.

"A year from now, users can get twice the performance they are getting today for the same amount of money," said Jennifer Munson, an analyst at WorkGroup Technologies, Inc. in Hampton, N.H., suggesting that as prices continue to fall, users may be tempted to buy new systems instead of recycling older ones.

Where the upgrades are

At the moment, the biggest upgrade market lies in the vast installed base of 486-based systems, said Steve Reynolds, an analyst at Dataquest, Inc. in San Jose, Calif.

"In the last three years, around 70 million or so 486 systems have been sold. Of that, half would probably benefit substantially" from the sort of upgrading that the Overdrive processor offers, Reynolds estimated.

Typically, the systems that would get the most significant performance boost from an Overdrive, page 44

PCs and Software Portable computers

Desktop Computing

Mt. Everest climbers take technical route

Notebook computers will track progress

By Michael Fitzgerald

Why surf the Internet from the summit of Mt. Everest? Because you can, of course.

Cruising the Internet from the top of the world is quite a feat, even for Steve Reneker, a 13-year information systems veteran who will set as facto chief information officer on the ’96 American Mt. Everest expedition that kicks off March 1.

Reneker hopes to bring technology to the top of Mt. Everest

Because organizers already planned to bring computer equipment for research purposes, electronic mail from Everest seemed eminently achievable.

"We've got high hopes. We've been long-time supporters of the expedition," said Bruce Stephen, an analyst at Dataquest, Inc. in San Jose, Calif.

Where the upgrades are

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Intel shifts into Overdrive

By Jaikumar Vijayan

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AST steadies notebook offerings

By Michael Fitzgerald

After a lackluster 1994, AST Research, Inc. is starting 1995 with an effort that may signal the end of its up-and-down performance in the notebook market.

The Irvine, Calif., company recently introduced the Ascentia 810N, a value-class corporate notebook that should give AST a temporary technological lead in the market. Corporations use value-class notebooks when they do not need or cannot afford a cutting-edge laptop but still want a full-feature notebook.

The 5.9-pound Ascentia 810N has a 10.4-in. passive-matrix color screen, a 66-MHz Cyrix Corp. DX2 486 chip and a second battery option. Its base price is $2,499.

According to figures from International Data Corp. (IDC), AST remained fifth in unit share of the U.S. notebook market in 1994, behind Toshiba America Information Systems, Inc., Compaq Computer Corp., IBM PC Co. and Apple Computer, Inc. But Apple's market share and faces pressure from competitors such as NEC Technologies, Inc., and Texas Instruments, Inc.

A good start

"AST had an off year in portables last year, and they needed to come out with guns blazing this year. This is a good start," said Bruce Stephen, an analyst at IDC in Framingham, Mass. "AST needs to build on this start and attack the competition, he said.

AST officials said they have a window to establish themselves in the value-class market. According to Stephen Andler, AST's director of portables marketing, the company has picked a larger screen and a faster (and cheaper than Intel Corp.) chip so it can at least get a short leg up on the competition.

"We're trying to give everybody a new definition of value," Andler said. "Our product is priced below some people's [50-MHz] DX2 systems, and we have a 10.4-in. display where everybody else has a 9.1-in. display.

But Stephen and other industry analysts said they expect to see a series of pitched fights in the value end of the corporate notebook market this year.

A number of feature sets now found in high-end notebooks should move into the lower-priced middle range of the market, they said.

Computerworld January 30, 1995 41
on a thing! So with Windows 95, authorized Windows 95, Andrew Schulman devotes some 600 pages everywhere in Windows 95. For example, thanks to Intel's quirky chip design, all Intel processors need a small piece of real-mode drivers) and virtual drivers (VXD) are installed, and these consume some memory. Microsoft has never done a good job of fixing Windows memory problems. Consider, for example, the Remote Access Server in Windows for Workgroups 3.11. It cycles its modem every few minutes, each time using up just a little more memory. After about 30 hours, Remote Access Server gimcrack has consumed so much low memory that Windows 3.11 can't start up some jobs. Microsoft's work-around: Tell users to periodically exit the server and restart it.

Every Windows program, Dynamic Link Library or driver allocates conventional DOS memory to start up a Windows application, even a 32-bit one. Low memory is a crucial system resource. Show me a Windows 3.11 system with a sound card and Sanyamter's PC Tools for Windows installed trying to run Symantec's CP Backup or DeLrina's WinFax Pro 4.0, and I'll show you an out-of-memory error. The device drivers you see listed in the Windows 3.11 Control Panel are normally loaded into low memory — the DOS addresses around Windows 95 operates exactly the same way.

Counting the advantage Right now, many corporations claim they won't purchase 16-bit Windows programs after mid-1996. They've decided (rightly) that Windows 95 won't run these 16-bit programs better than Windows 3.11. So long as 16-bit and 32-bit programs share the same conventional memory pool in Windows 95, this situation won't change significantly.

The advantage Windows 95 actually has over its 16-bit applications is a separate context — basically page tables for managing memory. Your 32-bit Windows programs do not get their own virtual machine — an exclusive address space. Windows 95 runs them in the same Virtual Machine No. 1 as the 16-bit ones. It doesn't take much speculation to envision a program-loading sequence that will cause out-of-memory errors even when there are plenty of other system resources available.

Just remember that the VXD's in your multimedia device drivers don't use memory above 1MB except for code, and data buffers and buffers for the hardware also remain in conventional (low) memory.


Medical company goes distributed

By Ed Scannell

In late 1991, the outlook for medical products distributor The Darby Group Co. was a bit grim. Severe competition was driving down prices and shrinking profits in an already marginal-thin business. The situation prompted Mike Ashkin, chief executive officer at the Westbury, N.Y., company, to launch a major technology renovation. His goal was to help the company deliver products and services faster and more efficiently as well as significantly reduce recurring cost.

One of those recurring costs was the company's aging network of host-based systems. "It was always a chicken or egg thing in terms of either downsizing employee applications or the IS operation," Ashkin said. "We were sort of betting the company on this move."

But Ashkin has paid off handsomely. In less than three years, Ashkin and his team have weaned Darby Group off a mishmash of host-based systems and software. The company now has a single host-based platform that anchors a more standardized distributed platform that is better able to accommodate emerging technologies. One result has been a streamlining of the information systems operation.

The PC difference

In late 1991, Darby's IS operating environment consisted of IBM 3090s, 4381s, 9370s and AS/400s running multiple operating systems; Digital Equipment Corp. VAX-based systems; and Paradyne, Inc.'s Data 100 network links connecting the company's dozen or so remote sites. There was not a LAN in the house, and the handful of PCs sat unconnected.

But during the last couple of years, all that has been sliced down to a single IBM 3090 running MVS. The company now has Microsoft Corp.'s Windows NT and Novell, Inc.'s NetWare 3.x running on relatively low-cost Intel Corp.-based servers connecting well over 1,000 PCs. The company has cut its IS expenses approximately 35% during the last three years and reduced annual IS labor costs by $250,000.

"PCs have given my company a chance to put a report on a laptop and distribute it to others — and not have to send weeks for IS to help him — he got interested," Cari Ashkin said. "It never hurts you to have the CEO of the company real-ly into the technology."

Through this distributed systems approach, Darby moved its order-entry application from its IBM System 370 architecture machines to LAN-based systems. Within 18 months of making that decision, the firm had replaced almost all of its terminals with PCs and built a wide-area network that connected all remote offices to the mainframe at headquarters. The company has also allowed Darby to improve the efficiencies of the "returns" aspect of its generic drug business. But the technology's market are more complicated than in other businesses because of strict government regulations.

Before the company proceeded with its distributed strategy, it was typically a few weeks behind in processing returns. But since the company rolled its IBM 4381 out the door and rolled in a server system running Windows NT and SQL Server, those backlogs have been cut down to a day or two.

While Darby has aggressively moved forward with its distributed strategy, including putting LAN administrators in some of its remote sites, company officials do not see true decentralization of IS operations coming any time soon. In fact, they prefer to keep a tight grip on certain core IS functions, including application software development.

"We used to have 100 people in IS, and now we have 32," said Bon Perlman, Darby's IS director. "We could accept a 30% reduction by eliminating anything that was redundant in the home office with remote sites. It is why you need to keep certain things centralized, even as you distribute other functions out."
Net only was Ted amazed at the low cost of the Digital terminals, he was even more impressed with their performance.

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Acer releases new server products, bundled software

By Jaikumar Vijayan

Acer America Corp., rated as one of the fastest-growing companies in the PC business, last week announced two server products and bundled network and server management software in the hopes of getting more recognition in the LAN server market.

The entry-level Acer Altos 800/P, based on Intel Corp.'s 90-MHz Pentium processor; was primarily designed as a file-and-print server that supports up to 22 users, according to the San Jose, Calif., company. The starting price for a base system is $3,118.

The midrange, dual-processor Acer Altos 7000/P, which is being positioned as a database/application server, supports two 90-MHz Pentium processors, up to 64 users and has a starting price of $5,187.

"Price/performance was a big factor in our decision to choose Acer," said Ken Bryant, information systems manager at John Williams, MIS manager at Priority Pharmacy in San Diego. Processor upgrades alone seldom boost system performance substantially, he said.

Logical decision

With new systems not quite lasting a year before requiring upgrades, "price always made more sense for us to replace the whole motherboard" when doing a systems upgrade instead of tinkering with jumper settings and switches on old motherboards, Williams said.

Williams, who said he has run into compatibility problems when attempting just a processor upgrade, said buying a new motherboard not only eliminates most system incompatibilities but is also pretty economical these days. "You can go out and get a real nice motherboard for less than $200," he said.

Despite the low prices, when it comes to older 286- and 386-based systems, Priority buys new systems instead of upgrading, Williams said.

Upgrade priorities

Another manager echoed that sentiment. "Right now, we have the option of upgrading our 486 systems, but all of our old 386 systems are going to be replaced," said 130MHz Bryant, information systems manager at General Health Practice Management, Inc. in Baton Rouge, La.

"Ease of installation and price are right on top of the list" when considering processor upgrades, Bryant said.

Intel's new Overdrive processors, which started shipping last week, will upgrade most 486-based systems with either a 257- or 268-pin socket, the company said. According to Intel, the user can replace the chip.

Mt. Everest

CONTINUED FROM PAGE 41

on a scanned orthographic photo.

The team also hopes to use the global positioning equipment to help verify Everest's elevation.

The group will use a second notebook to track equipment, keep medical records and do word processing.

But it is unlikely everest.net will happen on this trip. "We're missing a high-speed link," Reneker said.

Vendors have donated most of the group's equipment, On Technology Corp. is sponsoring its base camp and NEC Corp. has provided a satellite link and 300 minutes of free satellite time. The speed of the link, however, is 2.4K bit/sec, which is too slow for effective Internet communications. But the link can support fax communications at 9.6K bit/sec, so the team will send some faxes from its highest base camp.

New Products

Avid Technology, Inc. has announced MediaSuite Pro, a video editing system for Silicon Graphics, Inc.'s Indigo workstations.

According to the Tewksbury, Mass., firm, MediaSuite Pro lets users incorporate graphics such as real-time simulations, three-dimensional animations and structural models with video and audio.

Programs created with the product can be recorded, edited and played at full size and full motion and recorded directly from the computer to videotape. Programmable video effects include dissolves, wipes, motion control, chroma key, transitions and picture-in-picture.

MediaSuite Pro costs $14,995.

Summagraphics Corp. has introduced SummaColor Pro Series Models 1311 and 1317, desktop color printers.

According to the Austin, Texas, firm, the SummaColor Pro Series Models 1311 and 1317 are small-format digital printers that incorporate ink-dot-size control and thermal transfer technologies.

The printers are targeted at graphic artists and feature an optional Ethernet adapter, font support for PostType 1 Adobe Systems, Inc. fonts, a SCSI hard drive interface and 12M bytes of standard memory, upgradeable to 24M.

The letter/legal-size Model 1311 costs $6,495, and the tabloid-size Model 1317 costs $8,995.

MetaWare, Inc. has announced the High C/C++ compiler with a software work- around for the Intel Corp. Pentium Boating-point division error, and Cygnus Support has announced a similar patch for the GNU compiler-GCC. Both are free to users of the respective products. MetaWare, Santa Cruz, Calif. (408) 428-6392.

Cygnus Support, Somerville, Mass. (617) 629-300.

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Workflow is critical to bank’s new 401K system

By Mary Brandel

Texas Commerce Bank NA had a busy 1994. At the beginning of the year, all 9,000 employees at the Houston-based subsidiary of Chemical Banking Corp. embarked on a top-to-bottom re-engineering project, uncovering 15,000 recommendations for process changes.

In the midst of that project, the bank rolled out a new 401K business after acquiring Ameritrust, a trust company.

"We just got the salespeople" from Ameritrust, said Anita Ward, senior vice president at the bank. "So we had to look at operations and a system in the very near term so that we didn't lose market share to companies with an existing infrastructure."

In the spirit of re-engineering, Texas Commerce did not just create a mirror image of the Ameritrust business. "If we hadn't re-engineered the process, we would have created the same 401K product as others have," Ward said.

Instead, it created a 401K plan called Avesta. It has attracted 20,000 participants, with another 40,000 in the enrollment process. After just six months, Avesta revenue is 1½ years ahead of schedule, and operating expenses are down 50% from Ameritrust's business, Ward said. And whereas Ameritrust's 401K staff numbered 100, Texas Commerce employs just 16.

At the core of the 401K system — as well as many of the 1,065 projects scheduled to be completed this year — is workflow technology. Workflow is important to 401K plans because it can "bring together the investment plan with the individual's account," said Mark Hardie, a technology analyst at Tower Group, a consulting firm.

"You don't gain the maximum impact of re-engineering when you... actually draw a boundary around a process. For us to truly redesign and become a different bank, we had to take the entire bank... through this exercise," said an unnamed president.

Problems with paper

As Ward described it, many 401K systems are manual and error-prone. Participants fill out at least six long forms and give them to their human resources department, where they are compared against personnel records.

Those paper copies are sent to the bank, where the data is entered into its system. For six weeks, however, the form is not processed because participants are allowed to make changes. Making changes involves another piece of paper, which means "you're in a data entry frenzy for six weeks," Ward said.

At the end of the enrollment period — and at every payroll cycle — the client company sorts out 401K participants from the payroll, and the bank matches those records with its own.

"You're always reconciling paper to the payroll tape," Ward said. "And you end up with errors because maybe I just recently enrolled, but the payroll cycle ended two days ago."

Texas Commerce's new system sorts out those problems. The client provides the bank with an electronic payroll record for all employees. "All the data we'd need to set up a participant is resident on that record," Ward said.

To enroll participants fill out an electronic form on a PC at the client site. The PC runs ViewStar Corp.'s workflow software as well as some Windows applications.

Notes packages unite voice mail with E-mail

By Guruchir Mohan

LAN-based electronic mail was once considered quite a novelty. But as E-mail becomes more entrenched in organizations, users seem to be taking it for granted and looking for more functionality on their desktop. Or maybe vendors think users should want more than just E-mail in a package.

Acting on the premise that users need their faxes, voice mail and E-mail to arrive in the same mailbox, vendors are combining these diverse technologies.

At the Lotusphere conference in Orlando, Fla., last week, Big Sky Technologies in San Diego announced its Remark MessageCenter for Notes, a product that essentially integrates voice mail with E-mail.

An old idea takes flight

The concept of MessageCenter is not new to Big Sky. In the summer of 1993, the company, then known as Simpact Associates, introduced its PhoneClient development tools that third-party developers could use to write applications using Lotus Development Corp.'s Notes development platform. MessageCenter was written using PhoneClient. The latter sits on Phone Notes, which in turn runs on an OS/2-based server.

The company has essentially taken the development work out of developers' hands and left them with only the need to customize, said Dusty Sykes, a consultant at Vanguard Communications in Palo Alto, Calif. "Their developers were having to do so much, they refined [the product] and gave a bigger chunk of functionality with the PC, so that's how the product was born," Sykes said.

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*Intersolv*
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*SunSoft*
SunSoft's C++ experts will discuss the language, the industry, and how vendors will respond to growing user demands as the language evolves.

*SCO*
SCO will show you how to get past the "Motif barrier" with SCO Visual Tel, a full-featured, extensible, scripting language for building Motif desktop tools and applications.

*Silicon Graphics*
Andrew Palay, Principle Scientist at SGI, will discuss how Silicon Glasses Developer Magic environment supports rapid development of C++ applications with high-level builder components and new fix-and-continue functionality.

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Sync Research offers SNMP-based apps

By Laura DiDio

Sync Research, Inc. in Irvine, Calif., recently introduced new Unix and Simple Network Management Protocol (SNMP)-based applications for its FrameNode remote-access products and its Conversion-Node protocol converter devices.

The FrameNode remote-access devices transmit merged IBM SNA and LAN traffic and provide users with RFC1490-compatible access to wide-area networks over frame relay. The ConversionNode products act as protocol converters, merging LAN and SNA traffic on the same network.

The network management applications, dubbed SyncManager and Sync/Monitor, run on Unix and SNMP protocols. They let network administrators manage and monitor mixed SNA and LAN traffic while retaining the familiar look and feel of IBM’s NetView SNA network management, said Sync President John Rademaker.

Locus Computing Corp. has announced Locus/FTP Internet host file transfer, TinyTerm Unix terminal emulation and the Eudora local, enterprise and Internet electronic-mail interface.

According to the Inglewood, Calif., company, the products are options to Locus’ PC Interface 3.0 PC-to-Unix connectivity software. Locus/FTP emulates any TCP/IP host on the network or Internet and lets users drag and drop files from the remote host to the local drive or between remote hosts.

The Eudora E-mail interface is a graphical Windows interface to Unix E-mail servers.

Locus/FTP costs $79, TinyTerm costs $89, and the Eudora E-mail interface costs $59.

Belkin Components has announced OmnimView, a keyboard-controlled switch that lets users control up to six PCs from a single keyboard.

According to the Compton, Calif., company, OmnimView sends correct signals to the keyboard and mouse port so each PC acts as if it were directly connected. Users can select which PC to control.

The product requires no software installation and can be cascaded to control up to 216 PCs. A scan mode shows the status of each PC at selected intervals, the company said.

Omniview costs $349.

Berkley, Mich., company, CompassPoint has introduced Boarding House Reach, groupware that lets users copy a Windows clipboard from any computer in a workgroup with one mouse click. Cost: $49. Walter Ony Software, Boston, (617) 227-5620.

Texas Commerce reinvents self

CONTINUED FROM PAGE 47

ations that provide advice and what-if modeling to help with investment decisions.

From the workstation, field data is transmitted directly to a work queue at Texas Commerce. The workflow system automatically matches up information with the payroll record and then sends the form to be processed in a 401K accounting system. Unless the form is rejected, no human interaction takes place.

The bank also offers mail-in, fax-in and call-in enrollment via a voice-response unit. However, the fax option does require manual data entry “because there is no way to [read] optical character recognition data 100% accurately,” said Glenn Rust, vice president of management consulting. But mail-in forms are bar-coded with 100% accuracy, he added.

The payroll form is processed, the payroll record and then sent to the accounting system. Unless the form is rejected, no human interaction takes place. If the form is rejected, a senior accountant will process the form for the 401K participant.

Observers may wonder why all this re-engineering had to happen at once. But, Ward explained, “the entire field of banking is undergoing tremendous change. Mutual fund companies can sneak up on us, as can others in the credit-card market. And at the same time, people are moving toward home banking.”

Walter Ony Software has introduced Boarding House Reach, groupware that lets users copy a Windows clipboard from any computer in a workgroup with one mouse click. Cost: $49. Walter Ony Software, Boston, (617) 227-5620.

But the technology did not come first at Texas Commerce; business did. “We had the teams design new workflows ... without knowledge of the technology,” Ward said. “But often, it became apparent that the technology and workflow could assist the process.”

Volatitle industry

Observers may wonder why all this re-engineering had to happen at once. But, Ward explained, “the entire field of banking is undergoing tremendous change. Mutual fund companies can sneak up on us, as can others in the credit-card market. And at the same time, people are moving toward home banking.”

To prevent itself, “we had to take the entire bank through this exercise,” Ward said.

SgI proves smaller units can be better

Downsized Reality machines give users high-end graphics desktops

By Jean S. Rozman

Silicon Graphics, Inc. (SGI) recently downsized its high-end graphics Onyx Reality machines — the kind of computer that generated images for the movie Jurassic Park and designed submarines for the U.S. Navy.

Redesigned as a one-processor personal workstation for engineers and designers, the smaller unit is expected to revolutionize lists that control access to bigger Onyx Reality machines at busy engineering sites.

The Reality Station costs $84,000, far less than the $170,000 entry price for the large-scale Reality machines, SGI said earlier this month.

Users at sites that already own large Onyx Reality graphics computers, customers said the low-end version will probably shorten sign-up sheets for bigger machines at large engineering shops. “When you buy an Onyx, you put it in a lab, and everybody can share it,” explained Michael Zeitlin, a visualization technology manager at Texaco, Inc.’s Houston office. At Texaco, dozens of users share several large SGI machines to run seismic analysis and oil-reservoir simulation applications, he said.

A Reality Station would let users have a high-end graphics desktop, freeing the bigger machines to run larger problems, Zeitlin said. Today, Texaco uses SGI’s Indigo2 workstations — which cost up to $40,000 — to develop graphics applications that are later deployed on the large Onyx machines.

Putting the parts together

At General Dynamics Corp.’s Electric Boat Division in Groton, Conn., employees use a half-dozen large Onyx machines to run the design engineer team for the Navy. But smaller units could take on sections of a larger design. “The way you get the big models is by putting together little models,” said Jim Bou- dreaux, engineering manager for computer systems technology at the facility. “It would be nice if you could work on the little pieces without working on the big machine.”

“SGI’s Reality Station

Processors: 200-MHz Mips Technologies, Inc. 440-class CPU, 1M byte of secondary cache, 64M bytes of memory, a 256-byte system disk and a 21-in. high-resolution color monitor

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Base price: $54,900

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What's new on the wide, wide Web

A semiregular column with items of interest and amusement from the Internet.

Net news
- The Web is widening. According to Forrester Research, Inc. in Cambridge, Mass., by 1996 the Internet will eclipse the likes of Prodigy and America Online. Forrester predicts that the number of proprietary on-line service users will grow from 4.7 million today to 10 million in 1997. After that, the number will decline as consumers opt for the Internet. By the year 2000, Forrester said, there will be 6.7 million users of proprietary services vs. 22 million users of the World-Wide Web.

- Spy, Inc. in Seattle has released a Box, a one-disk-software package that includes a Mosaic browser for the Web and an automated network sign-up through the more than 400 worldwide nodes of the CompuServe network. Spy said it will offer customized versions of the package for corporations that want to distribute Mosaic In A Box to their customers. The suggested retail price for the software is $49.95; connection rates include a $9.95 monthly fee and $3.95 per hour after the first hour.

- Reacting to price breaks like this for Internet users, CompuServe said it will cut its 14.8k bit/sec. access rate from $9.95 per hour to $4.80 per hour (plus the $9.95 per month fee for an ensemble of basic services) on Feb. 2.

- But CompuServe — not to mention rivals Prodigy and America Online — is feeling pressured by the impending arrival of The Microsoft Network in August. Pricing for the Microsoft Corp. offering, which will be available to Windows 95 users, has not been disclosed, but observers are convinced it will seriously undercut the rates of existing public data networks.

- Speaking of Internet strategies, Prodigy became, as expected, the first provider with a Web browser. The feature was launched Jan. 17. CompuServe and America Online are expected to follow suit.

- And IBM, which already claims 35,000 dial-up Internet users via its OS/2 Warp, last week at ComNet launched a business service for dedicated Internet links ranging in speed from 56k bit/sec. to T1. Advantis, IBM's networking arm, will handle the dedicated lines and firewall services. Pricing for the services has not yet been set, Advantis officials said.

New sites
- The Institute of Electrical and Electronics Engineers, Inc. (IEEE) home page (http://www.ieee.org), a separate page and complete issue of The Institute, a new supplement to IEEE's Spectrum magazine (http://www.ieee.org/ii.html).

- United Nations, a Web page with links to information available at the UN (http://undep.org/un-links.html).

- Disability Mail, the first Web page for people with disabilities (http://disability.com/).

Just for fun
- The Real Beer Page, for devotees of craft brewing (http://and.com/realbeer/).

- VolcanoWorld. This Web site, funded by NASA, includes reports and pictures of the latest eruptions, photos of many other volcanoes, a developing virtual field trip and more (http://volcano.usgs. nodak.edu).

Tips and tricks
- The exact meaning of The Internet Yellow Pages (Osborne McGraw-Hill, $29.95) by Harley Hahn and Rick Slout. The authors have succeeded again in putting information about the most dynamic place in the world, the Internet, between two familiar covers. Best of all, the Yellow Pages is as witty as it is informative.

- One of the best jump-off points for 'net surfing is the Yahoo directory (http://akabono.stanford.edu/yahoo). This Web location, maintained by students at Stanford University, contains more than 25,000 uniform resource locators in its searchable database. More than 700,000 files are accessed from this site daily.

Networking standard promises clear picture

By Steve Moore:

Building and maintaining an accurate map of a multivendor computer network is often an exercise in frustration. While a motorist can easily obtain a single map showing all the highways and byways in every state and county nationwide, a network manager must piece together maps of overlapping, vendor-specific domains that vary widely in geographic scope.

To ease this problem, Ciseo Systems, Inc. in San Jose, Calif., recently launched an effort to develop a common format called the Common Internetworking Topology Initiative (CITI). This was designed to allow different vendors' internetworking devices, network management platforms and network design and optimization tools to share configuration information (see chart).

Vendors that have agreed to participate in the CITI effort include the following:

- Accugraph
- Cabletron Systems
- Chipcom
- Iciscad
- Kil Networks
- Optical Data Systems
- Remedy
- SunSoft
- Make Systems
- NetManage
- SYBEX

The CITI, a standards group, is developing an ASCII-based, common interchange format with E-mail capabilities. This will allow a network manager to consolidate topology information from many different vendors' management tools into one cohesive network diagram. Where topology information becomes critical because LANs are breaking up into multiple segments," he added.

Fireman's Fund Insurance Co. in Novato, Calif., avoided the problem of multiple, inconsistent topology formats by "standardizing early and sticking to our guns," said Virgil Pittman, the company's senior vice president of systems.

Fireman's uses IBM's NetView; is standardized on OS/2 workstations and has an internetwork based on IBM 3274 controllers rather than routers, he said. "Unless the CITI participants standardize on what I have now, I'm not going to spend a lot of money to get a new, standardized way of doing things," he said.

Speedy resolution

For companies that have not been so fortunate in building consistent computing and networking environments, CITI could bring significant benefits. "The thing that will make this initiative happen is to keep it simple technically and bring it to closure quickly. But if it takes three years to become official, who cares?" said John McConnell, president of McConnell ConsultingCo. in Boulder, Colo.

Vendors of network design and optimization tools have expressed interest in the CITI effort, but none have become members yet. "The concept of a common [topology] interface standard is a good one, but it solves only part of the problem," said Steve Howard, president of Make Systems, Inc. in Mountain View, Calif.

There are key attributes that should be in the core standard but are not, Howard said. If, for example, his company's application requires something not provided in the standard, then Make Systems must somehow reconcile that problem, he said.

While different network management applications may produce diagrams that are functionally correct, Dubiel noted, "they don't come out physically the way you'd like them to look. You'd like some geographic sensibility to it, so the 20th floor doesn't end up higher on the diagram than the 10th floor."

Beyond the topology format issue looms the more difficult problem of standardizing the format of network traffic flow information. This would allow users to get a clear picture of the types and amounts of data traversing a network, even if many portions of that data are associated with different vendors' networking products.
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SEE, HEAR AND FEEL THE DIFFERENCE:

NEC
By Gary H. Anthes

Electronic currency: A cash cow

Just as currency long ago replaced barter in our society and more recently paper checks and plastic cards have supplanted currency, electronic payments may soon be an important — perhaps dominant — way to settle accounts.

Developers of electronic payment methods said the technology holds great promise for publishers, corporations, and individuals looking for a safe, inexpensive and easy way to make purchases and companies that see the technology's potential in billing and collection systems.

But a lack of standards and a host of thorny legal and political issues suggest that the widespread use of network-based payment mechanisms will not occur overnight (see story below).

Some of the emerging electronic payment methods are based on ordinary credit-card transactions, which are protected by encryption for transmission over networks. Others resemble checks, and still others are more like cash. University research as well as fledgling commercial efforts are attempting to combine the advantages of these familiar mechanisms while sidestepping their respective drawbacks.

Reducing risk

For example, CyberCash, Inc. in Reston, Va., said its Internet-based credit-card service will use encryption technology to reduce the risk and cost associated with the use of credit cards by mail or telephone. CyberCash recently teamed with Wells Fargo Bank in San Francisco to introduce a service for electronic buying using credit cards.

Later this year, CyberCash plans to provide a hybrid service intended to offer the convenience of checks and the reliability of cash. Like a check, it can be used at a distance, but like cash, its validity can be verified instantly, said Stephen D. Crocker, senior vice president for development.

CyberCash uses encryption technology and a server that mediates transactions among buyers, sellers and banks. In the case of electronic cash, it receives, holds and transfers money balances much as a bank does.

Electronic cash is attractive when purchases are too small to be cost-justified as credit-card transactions, as when a user wants to buy a small amount of information from an on-line service provider. Carnegie Mellon University in Pittsburgh has developed NetBill for electronic "micropayments," which can be used reasonably for purchases as low in value as 10 cents, its creators said (see chart).

Systems such as NetBill will make it safe and feasible for publishers to sell information over the Internet, a distribution medium shunned by them so far. NetBill allows the publisher to send encrypted information to a buyer without sending the key to decrypt the file until a NetBill server has debited the customer's account and credited the vendor's account.

The university will set up a NetBill pilot by the end of the year and will eventually license the technology to one or more commercial services firms, the university said.

Another effort soon to go commercial is under way at the Information Sciences Institute (ISI) at the University of Southern California in Marina Del Rey. The technology is based on Kerberos security software, which allows access without sending passwords over the network.

ISI's NetCheque, which will be used in commercial applications by CyberSafe Corp. in Redmond, Wash., uses an "accounting server" — acting as a virtual bank — to allow electronic check-writing. This will let companies set up their own on-line "banks," integrating their internal accounting systems with the external banking hierarchy.

A lack of standards for interoperability is not the only impediment to the widespread use of electronic cash. Last year, the Cross-Industry Working Team, a group of computer scientists, computer information and service providers, said in a report that digital cash raises issues of safety, privacy, regulation, administration and computer crime that have barely been considered, much less solved.

"The decisions and collective wisdom don't exist in financial and technological systems at the moment. Proprietors and decision makers and ultimately of ordinary consumers, will be needed to realize the potential benefits of this emerging technology," the group wrote.

Mixed signals?

In the past year, a dozen or so firms have announced plans to offer products or services based on electronic credit-card, debit-card, check or cash transactions over the Internet. Will they result in a digital Tower of Babel?

"The hope is if you get it right in one of these forms, you will be able to convert it automatically to another," said Clifford Neuman, a computer and information sciences expert at the ISI at the University of Southern California. "But I think it's going to be a while before we see that. First we'll go through a period where a lot of things don't talk to each other, unfortunately."

Gary H. Anthes
Enterprise Networking

Router vendors emphasize integration

By Stephen P. Klett Jr.

To compete in the low-end router market, vendors are struggling to leapfrog one another by cramming as many bells and whistles as possible into their platforms while keeping prices low.

Microm Communications Corp. and Dynatech Communications, Inc. threw their respective hats into the ring recently.

Microm, based in Simi Valley, Calif., unveiled the NetRunner Integration Router family at last week's ComNet trade show in Washington, D.C. NetRunner, which supports Novell, Inc. IPX and TCP/IP routing, will integrate voice, fax, legacy and LAN traffic. Two branch office and two central site models are included in the family. Prices range from $2,450 to $12,000.

Dynatech Communications, a subsidiary of Dynatech Corp. in Woodbridge, Va., last week launched the DynaStar 100 router targeted at branch office networks. The DynaStar 100 supports concurrent IP and IPX routing over wide-area via frame relay and X.25, and it offers bridging and LAN dial-in/dial-out capabilities. Prices start at $2,450. The DynaStar 100 also offers an expansion slot to which users can add more Ethernet, Token Ring, Integrated Services Digital Network (ISDN) or wide-area network ports. It supports Simple Network Management Protocol management and remote reconfiguration and software updating, Dynatech officials said.

"Remote-access vendors are consolidating a lot of functionality into a single box, which is good because as a branch manager you really want to have a multifunction platform to help reduce management costs," said John Morency, principal analyst at Strategic Network Consulting in Rockland, Mass.

Users agreed.

"Remote routers have to be cheap and easy to maintain. You have to be able to put them on the top of a shelf somewhere and forget about them," said Bill Blackmer, senior information support analyst for Marin County, Calif. "If not, we're in deep doo-doo because we'd have to hire eight more of me just for router support," Blackmer added. Remote routers from 3Com Corp. play a crucial role in the county's ongoing project to link area schools and businesses to the county's wide area network (CW, Nov. 21, 1994).

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**Waste-to-energy firm uses imaging to dam paper tide**

By Thomas Hoffman
FAIRFIELD, N.J.

For a company that manages 28 waste-to-energy facilities throughout North America, Ogden Projects sure had a lot to learn about conserva-
tion.

That is because the $700 million subsidiary of New York services giant Ogden Corp. used to store all of its purchase orders, invoices and other back-office accounting documents from its energy plants in a mountain of paper files here and at a records retention warehouse in Newark, N.J. But that has all changed with the recent installation of an IBM AS/400-based im-
aging system designed to streamline the flow of documents among Ogden Projects' facilities, which are as far-flung as Dartmouth, Nova Sco-
tia, to its headquarters here.

When the company broke ground for its new-
est facility in Montgomery County, Md., in 1993, "We estimated our paper flow at 2 million pieces a year and counting," said Donald F. Warga, manager of systems and programming at the unit. Obviously, we had to find a better way to manage our internal paper flow."

**Best way to proceed**

Ogden Projects did not decide to install an im-
aging system until a group of IBM consultants
reviewed its operations in March 1993. Ogden Projects hired IBM to determine how it could better redesign its storage and retrieval opera-
tions to handle the vast amount of paperwork the company is legally bound to preserve for all of its plants.

Following the study, Ogden Projects decided
to maintain the past three years' worth of doc-
umentation from each plant at its Newark, N.J.,
records center for legal purposes. The company
also decided to funnel the daily volume of
paperwork through the imaging system,
Warga said.

"In every time Ogden Projects built a new
facility, they generated additional paper-
work and needed extra clerical staff to handle it," said Jo-
aane O'Neil, an IBM image consultant.

For example, Og-
den Projects already had a computerized accounts payable system in place, but
merely tracked the paperwork manually. -
- a tall order for a unit that handles more than 50,000 claims a year from as many as 12,000 vendors.

So in June 1993, Ogden Projects moved for-
ward on Armonk, N.Y.-based IBM's advice to in-
stall an imaging system. The system, which cost approximately $500,000, includes an IBM 3995 Optical Library Data
Server; Kodak High-Volume Image Link 900 Scanner; IBM
AS/400 Model 30; and
IBM ImagePlus/400 and ImagePlus/Workstation
software.

Donald F. Warga says Ogden Projects was moti-
vated to find a better way to handle the 2 mil-
lion pieces of paper if generated in 1993

**Easing the load**

A few of the 12 staff-
ners who manage Og-
den Projects ac-
counts payable
department said the system has helped make their workload more manageable
this past year.

"We're dealing with so much volume here that it really makes a system like this vio-
ble," said Ed Anders-
on, an imaging clerk who was hired last November to scan the documents into the system. "Rather than having three years of files in this building, the imaging system takes up a lot less space," Anderson added.

"I think it's wonderful," said Jayne Gorah, an accounts payable clerk who is linked to the sys-
tem through an IBM OS/2 gateway. "It's so much easier to sit at your desk and retrieve files on your computer screen than to get them from the file room."

In the past, Gorah said, it took her up to half
an hour to locate an invoice in the file room and
Waste to energy, page 62
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Plenty of outsourcing deals have been cut over the years in which a team of vendors provide a swath of services with each team member providing a specialty such as data center outsourcing or LAN support. But usually in these team arrangements, the customer designates one provider as the lead contractor, and that contractor serves as a single point of contact, assumes risk and has the ultimate responsibility for the project.

So outsourcing industry watchers agreed that the recent 10-year, $500 million contract signed by Houston-based Halliburton Energy Services was unusual. While Halliburton handed over the bulk of its information technology operations to Andersen Consulting, I-Net, Inc. and Power Computing Co., it did not name any of the three as the prime contractor.

Instead, Chief Information Officer Dick Teel said Halliburton signed separate contracts with each company and held on to management responsibilities itself.

"We felt we could better manage than any of the outsourcees could," Teel said. Halliburton chose the combination of vendors because it promised more variety of expertise than could a single vendor, he said.

The arrangement calls for Power Computing in Dallas to provide data center management, for Andersen in Chicago to provide application maintenance and client/server development and for I-Net in Bethesda, Md., to provide global networking and LAN support. "One of the disadvantages of the traditional prime/sub arrangement is sometimes you want to get to the subcontractor and the prime is in the doorway standing in the way," Teel said.

Steve McClellan, an outsourcing industry analyst at Merrill Lynch & Co., said he understood the sense in Halliburton's approach. "You don't see it happen very often that responsibility isn't given to a single vendor. But you keep a lot of control that way," he said.

Rudy Hirshheim, an outsourcing consultant and professor of information technology at the University of Houston, predicted that the "no prime" arrangement will become more common because prime contractors add cost by charging for risk and responsibility.

A potential downside to Halliburton's decision not to name a prime contractor is coordinating all the vendors. No one seemed more aware of that possibility than Teel, who also said he recognizes the potential for vendor finger-pointing if things go wrong.

To minimize potential conflicts, Halliburton and the three vendors signed a joint vendor management agreement that spells out each vendor's precise responsibilities.

Some industry watchers were skeptical about that arrangement. "It's kind of like the United Nations has rules of conduct. Good luck; it doesn't always work," McClellan observed.
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<td>Index Scan</td>
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<td>Inserts</td>
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<td>Deletes</td>
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The Practitioners Forum

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High-end updates target Visual Basic

By Elizabeth Heichler

High-end client/server tool makers Cognos Corp. and Progress Software Corp. are giving their customers more options for using Microsoft Corp.'s Visual Basic.

In recent weeks, Cognos in Burlington, Mass., disclosed plans to include a Visual Basic-compatible scripting language and event-driven form designer in the next release of its Axiant client/server development environment (see story at right). Meanwhile, Waltham, Mass.-based competitor Progress likes Visual Basic so much it bought a company — Crescent Software, Inc. — that manufactures add-on products for developers using the language.

Users and other observers welcomed both vendors' plans.

"Cognos customer David R. Doucette, a project manager at Wellesley, Mass.-based software vendor MultiTasking Systems, Inc., said he looks forward to being able to use a Visual Basic-compatible language from within Axiant. "Visual Basic has a lot of good points, but it's still a third-generation language, he said.

MultiTasking sells a lease accounting application. The company used Powerhouse Client for Windows to develop the front end for one product and Visual Basic to design the front end for another. Doucette said he hopes his company will be able to merge the two products when Axiant 2.0 is delivered later this year with the promised enhancements.

By enhancing Axiant with VisualWare, an event-driven screen painter that Cognos has licensed from InterGroup Technologies in Bellevue, Wash., the company hopes to resolve a problem another user has had with Axiant 1.0. "There's a lot of momentum growing behind Visual Basic. This is an example of two established players lining up to add to that momentum," concurred Ed Aley, a director at International Data Corp. in Framingham, Mass. He said he expects more companies to begin focusing attention on Visual Basic.

Cognos Consulting Group in Newton, Mass. "Companies with high-end development systems say, 'There are as many as I million active Visual Basic users, and they're going to start hitting the wall. Why not go after them?,'" she explained.

"The most disappointing thing has been that the GUI isn't what we'd like. That's why we're really pleased with Cognos' plans; it gives us everything we want," said Rob Wilson, a director at Information Specialists Ltd. in Chichester, England. Wilson has been using the first release of Axiant to develop a project-tracking application for the construction industry.

IBM's little database faces big battle

By Kim S. Nash

IBM announced a skinny single-user database last week aimed at consumers and small businesses. Due for delivery in mid-1995, Ultralite is IBM's answer to PC-based databases from Lotus Development Corp. and Microsoft Corp., officials said.

But IBM faces a strenuous work out on the industry Stairmaster to coax non-IBM shops to adopt its slim 4M-byte database, users and analysts said last week.

Crowded field

Microsof's Access and Lotus' Approach are entrenched, and Oracle Corp. recently joined the junior database club with Personal Oracle 7 (CW, Jan. 16). Sybase, Inc. plans to address the issue with its Watcom database it is expected to acquire via its proposed merger with Powersoft Corp.

Critical for any new database is support from third-party developers, which may or may not choose to write applications for the product. But the jury is still out. "I'd consider supporting it if it gained market share in six months," said Janet Perna, director of database technology at IBM's Toronto laboratory.

For example, when Ultralite hits the shelves at retailers such as CompUSA and Egghead Software in a few months, the package will come with programs for managing personal finances, tracking home wine cellars and keeping lists of phone numbers, she said.

The product will talk to other end-user applications through Open Database Connectivity links. Support for Microsoft's Object Linking and Embedding and OpenDoc, a connectivity standard under development mainly by IBM, Apple Computer, Inc. and Novell, would appear in Release 2.0 of Ultralite, Perna added.
Application Development

Software AG to revamp state tax system

$15 million deal involves Natural, Adabas

By Rosemary Cafasso

The California State Board of Equalization — essentially the state's tax man — plans to spend $15 million in the next two years to revamp its legacy systems into one integrated set of tax applications. Earlier this month, the agency announced a deal with Software AG of North America, Inc. in Reston, Va., to purchase the Adabas database management system along with Natural, a fourth-generation language (4GL), and a series of Natural development tools.

Efficiency is vital

The idea is to get rid of inefficiencies in tax management and processing that have resulted from relying on dozens of separate applications, said Burt Oliver, executive director of the California State Board of Equalization in Sacramento. Many of the applications were written in the 1960s and over the years have been patched and modified. Some have duplicate data and none of them can share information, Oliver said.

"Because of the way our tax programs grew, we have different [software] for each tax," Oliver said. "It is very inefficient and difficult to deal with."

Just one example: The sales tax systems alone work with a million active accounts at any given time, Oliver said. To pull off this overhaul, the information systems staff will comb through current applications, collect common data, store the data in a new Adabas database and then rewrite applications to work with the new database management system.

The State Board of Equalization administers most of California's major state taxes, including consumer-use taxes such as excise, alcohol and cigarette taxes. In its 1985-86 fiscal year, the state pulled in $26.9 billion in revenue for state and local governments. To some observers, the Software AG contract is a thumbs-up for the soup-to-nuts development approaches that include the database, language and tools from a single source.

"The thrust so far [in the market] has been on the new wave of products," said Ed Aley, an analyst at International Data Corp. in Framingham, Mass. "But Natural is an extremely robust 4GL. So the idea that the old stuff isn't good anymore isn't always accurate."

Other observers, however, said they consider the deal just another example of an old-line company mining its customer base.

"There's no question that Software AG has landed some big contracts, but most of the time they have been selling into their installed base," said Donald Feinberg, an analyst at Gartner Group, Inc. in Santa Clara, Calif.

Although Software AG is a long-time software provider to the state of California, it won this bid over 10 other vendors, Oliver said.

"In terms of performance, flexibility and moving to client/server, we concluded that Ababas and Natural were the best and safest," said Bob Ferguson, a manager in the agency's IS group.

The agency kicked off the project in late 1994 and plans to complete development by May 1997. The staff has moved beyond planning to "requirements analysis," Ferguson said.

**The California State Board's Burt Oliver says a revamp is needed to expedite tax processes**

XDB branches out

XDB Systems, Inc. in Laurel, Md., will embed its XDB Lite database into development tools from Syntec Corp., Micro Focus, Inc. and Platinum Technology, Inc.

Hitachi seals middleware deal with IBM

Hitachi Ltd. in Japan has signed a deal to develop message-oriented middleware based on IBM's MQ Series technology. The Hitachi product, due out by September, will be written to the MQ Series application programming interface that controls messaging among different computer systems, the companies said. Hitachi initially plans to bundle the middleware with its transaction processing software for workstations and mainframes. The deal is the first time IBM has licensed the MQ Series to another vendor.

Informix buys part of ASCII

Informix Corp. in Menlo Park, Calif., has purchased the database division assets and software licenses of ASCII Corp., a leading Japanese software firm in Tokyo. Price was roughly 4.2 billion yen or $42 million.

OMG adopts object standard

The Object Management Group (OMG) in Framingham, Mass., has adopted the Common Object Services Specification Volume 2 (COSS 2), a specification on how to build four basic services into a Common Object Request Broker Architecture (CORBA) environment. COSS 2 will provide CORBA-conformant object request brokers with object transaction, externalization, relationship and concurrency control services.

Powersoft doubles 1993 revenue

Powersoft Corp. in Concord, Mass., last week reported fourth-quarter results with net income of $4.2 million on revenue of $40.5 million.

A reminder that for enterprise-wide client/server development, integrated accounting, and decision support, slow is

Speedware Corporation is an international organization with 25 offices around the world, thousands of satisfied customers, and products with a proven track record.

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**Application Development**

**New Products**

Premia Corp. has announced Codewright Professional 3.1, an editor for C/C++, Assembler, XBase, Pascal, Cobol, Borland International, Inc.’s Paradox, and Microsoft Corp.’s Visual Basic. According to the Portland, Ore., company, Codewright Professional 3.1 lets users switch among build, file find, browse and other output windows. A VDOS command shell lets users interact with DOS commands and associated output in a Codewright edit window, and a Help Indexer scans and indexes a system’s help file. The product lets developers extend search-and-replace operations across a list of project files in a single operation. Codewright Professional 3.1 costs $249 for a single user or $995 for a five-user license.

Business Tools, Inc. has announced TAS Professional 5.0, a fourth-generation language database application development environment for DOS.

**Visual Basic**

CONTINUED FROM PAGE 63

nancial software developer in Waltham, Mass. The company is using Visual Basic as one of its main development environments, he said.

“The problem with Visual Basic add-ons or components is that lots of mom-and-pop operations are doing them, and sometimes components from very small companies can be flaky or low quality,” Kalin said. “Those who want to use components are faced with the problem of how to sort out the garbage from the good stuff. Progress can invest quite heavily to become a one-stop shop for Visual Basic add-ons.”

He added, “The industry as a whole has not given enough attention to Visual Basic as a true development language. Visual Basic has great potential.”

According to the Chapel Hill, N.C., company, TAS Professional 5.0 has added an integrated memory manager, mouse support, serial port communications and graphics capabilities. The product includes a screen painter, program generator, source code editor, report writer, import/export routines and a data dictionary maintenance program. TAS Professional 5.0 uses the Bitwise database file manager as its file handler. It comes file ready and can be run in single or multiuser mode.

TAS Professional 5.0 costs $599.

Allen Communication, Inc. has announced Quest 5.0, a multimedia authoring system for Windows. According to the Salt Lake City company, Quest 5.0 lets developers assemble graphics, text, audio, video motion, buttons and animations or set up branching and interactions.

Users can develop at the design level for overall structure and interactions or at the frame level to see exactly what the end user will see. Live objects let users modify object properties during both development and runtime.

Lexicus Corp. has announced Lexicus Longhand, handwriting recognition software for developing cursive writing-based applications for the Windows for Pen Computing operating system. According to the Palo Alto, Calif., company, Lexicus Longhand recognizes and corrects natural handwriting.

A 25,000-word customizable dictionary immediately corrects errors, anticipates common user words and recognizes proper nouns. The product has a recognition speed of 12 characters per second.

Lexicus Longhand costs $149.

Revelation Technologies, Inc. has announced OpenInsight 2.5, a repository-based development environment for programmers of Windows applications on LANs.

According to the Stamford, Conn., company, OpenInsight 2.5 provides a mirrored repository that lets systems administrators apply a mirror to the main repository table so the system can recover from a fatal repository file corruption. A report designer lets users modify reports and access OpenInsight data without programming. OpenInsight 2.5 costs $995 per developer.

Soffront Software, Inc. has announced Track for Windows 2.0, bug tracking software. According to the Milpitas, Calif., company, Track for Windows 2.0 uses a customizable database to define bugs and inform users of new bugs and the status of bug fixes.

The product includes a query mechanism, text and graphic report formats, a change history, automatic notification, multiuser access, security and import/export capabilities. Track for Windows 2.0 is based on a query-by-example model that lets users enter a query by filling out the same familiar form used to record the defective data. Track for Windows 2.0 costs $495.

Soffront Software (408) 263-3703
The SAS System for Information Delivery is a new concept in client/server software. It provides workable strategies for overcoming the barriers that stand between people and the information they need. For instance, the SAS System strategy for **universal data access** makes it easy to reach all your diverse “islands of information”—including host system files, flat files, and corporate DBMS's such as DB2®, ORACLE®, and dBASE®.

An exclusive MultiVendor Architecture™ is behind the SAS System’s strategy for **hardware independence**. Applications run the same way across PCs, workstations, and host systems—making true client/server computing a reality while exploiting the particular strengths of each platform.

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See for yourself how the SAS System of software brings out the best in your hardware and the people who use it. Just give us a call at **919-677-8200** for a free video, plus details about a free software evaluation.
Think your objects look pretty good? Then show them off by entering the Computerworld Object Application Awards competition. The winners will be announced in a special awards ceremony on August 16 during Object World San Francisco.

Object-oriented technology is on the cutting edge in the information technology world today and Computerworld wants to put the spotlight on your custom application.

Show us what your objects look like.
Your entry for Computerworld’s 1995 Object Application Awards should be an internally developed, custom object-oriented application currently in use (not a prototype) and not for resale. It should be either an entirely new application, a modification of an off-the-shelf application, or an object-based, front-end for a host application.

Then meet Steve Jobs on August 16.
In a special awards ceremony at the Moscone Convention Center in San Francisco, Steve Jobs, Chairman and CEO of NeXT Computer Inc. will present the awards for outstanding application development using object-oriented technology. A reception open to all attendees will follow.

Call today for entry.
To request your official entry kit*, call or fax:

Bill Hoffman
Computerworld Object Application Awards
c/o Object Management Group
492 Old Connecticut Path
Framingham, MA 01701
Telephone: (508) 820-4300
FAX: (508) 820-4303

Deadline for entries is Midnight (EST), May 16, 1995

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Information systems are only as good as the people who build them. And lately, the people who build them have had a lot more on their minds than computers.

Corporate downsizing, ongoing business process re-engineering and frequent organizational restructuring are wreaking havoc with IS morale, which at many companies is at an all-time low. Changing technologies, the move to client/server and closer workings with business users are requiring new skill sets. Project demands are high, but worker motivation is low. Job security is all but nonexistent. In many cases, so is trust in IS management.

IS managers are finding that to turn this picture around, they themselves must do an about-face. And they are tapping an unlikely source for help — the corporate human resources organization.

The traditional IS image of HR as a legion of well-meaning but essentially useless bureaucrats seems to be fading. In its place is a growing dependence on HR to help with restructuring and retraining IS staffs and finding new ways to motivate employees and keep them happy and productive.

These HR/IS efforts aim to meet the needs of both individual staff members and the organization. Such efforts include the following:

- Providing one-on-one counseling sessions with IS staffs about their retraining needs and strategies;
- Developing compensation and reward systems and devising more appropriate ways to measure individual performance on teams;
- Establishing training programs to accommodate the transition from centralized to distributed computing.

This contrasts sharply with the picture common just a few years ago, when many IS managers viewed HR as clueless about day-to-day IS operations. On the whole, an us-vs.-them attitude prevailed.

"Traditionally, the IS mind-set has been that human resources is good for policy but doesn't help retrain and motivate distressed and distrustful staffs."
CONTINUED FROM PAGE 69

really help in meaningful ways,” says Owen Barker, a 20-year IS veteran now an IS human resources consultant at Georgia-Pacific Corp. in Atlanta. “HR is typically viewed as a bureaucratic staff function that creates procedures and then leaves interpretation and implementation up to the operating units.”

Gradually, traditional HR organizations are beginning to change, experts say:

“Some companies are waking up to the need for HR to redefine its role,” says Charles Savage, president of Knowledge Era Enterprises, Inc., a management consultancy in Wellesley, Mass. Increasingly, HR, like IS, is being integrated into the rest of the business, he says. For instance, several companies have appointed HR liaisons to work with IS departments; others have set up entire HR groups with IS to work exclusively on IS personnel issues.

Georgia-Pacific, Chevron Information Technology Co. in San Ramon, Calif., and Rochester, N.Y.-based Xerox Corp. — long regarded as a corporate organizational innovator — have set up such groups.

As companies adopt new client/server, object-oriented and other technologies, retraining personnel has become a primary challenge for both HR and IS.

To this end, an increasing number of HR and IS managers are working together to set up competency review programs to determine precisely those areas in which IS staffers may need additional skills or training.

“That’s kind of a soft background. That’s kind of a hard place.”

For Webber, President of Information Technologies Management

“One of the biggest issues we face from a morale standpoint is the lack of job security, and in the past couple of years job security has become a high-priority item for IS employees,” says Rose Taylor, general manager of planning at Georgia-Pacific. “HR has helped IS to understand the level of reward that is appropriate.”

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Security vs. employability

At Chevron, HR staffers are credited with enabling IS managers to implement an altogether new concept of employability.

“One of the biggest issues we face from a morale standpoint is the lack of job security, and in the past couple of years job security has become a high-priority item for IS employees,” says Rose Taylor, general manager of planning and architecture.

With the help of HR, Taylor says, IS employees have training opportunities that allow them to keep their skills current.

Now, for instance, even though Chevron is moving from a mainframe-centric environment to a client/server one, “we still need a lot of mainframe people to maintain legacy systems,” Taylor says. As a result, the company can’t assign all IS staffers to highly prized client/server projects. “But what we can do is provide educational opportunities [in the form of outside classes or in-house training] so that they’ll know those skills ahead of when they are needed,” she says.

Another HR initiative at Chevron that has helped dispel job insecurity is a self-nominating process for open IS positions. Under this system, employees recommend themselves for open positions. Final decisions are made by a selection committee whose members are known to the staff.

Previously, “the process wasn’t as formalized,” Taylor says. “A job would come up, we’d let the supervisor know, and the supervisor would let the employees know.” That was the extent of employee involvement.

Now, “there’s not this vision that something is happening behind closed doors,” Taylor says. “Employees have a good understanding of how a job was filled.”
Overall, Taylor likens the role of the HR professional in this process to that of a counselor who coaches IS staff about their training needs and choices. "Joan Bardez, Chevron's HR manager, views the HR role much the same way: "In the absence of job security, "the whole issue of what employees want from a company and what a company's responsibilities are are big issues," Bardez says. "We're trying to move toward a philosophy that we'll do as much as possible to help employees remain employable here or elsewhere.""

Eyes on the prize
At Xerox, which last year outsourced all of the legacy systems to Unisys Data Systems Corp., a key goal of the IS-based recruitment department is to recruit top IS talent to work on state-of-the-art object-oriented systems. Another goal for that 10-person group, according to Bob Monastero, director of global processes and information management, is "to build a worldwide repertoire of skills" by training Xerox IS staff in object-oriented and client/server technologies.

To meet the first goal, the company has established a software technologies career center in California, Massachusetts and New York, with a fourth location planned. By giving recruits a choice of geographic locations, Xerox hopes to attract the best and brightest object-oriented professionals, Monastero explained.

Xerox, has also begun offering up to 12 days of training annually to the 740 IS employees it retained after outsourcing its legacy systems to EDS. Most staffers, Monastero says, will spend seven or eight days in classes, at an average cost of $1,000 per person. Such training, he notes, improves workers' employability at Xerox and elsewhere.

This is one of the reasons, Monastero says, that Xerox is also interested in developing innovative evaluation and remuneration programs, such as performance-based pay scales. The company views such programs as a way to motivate and retain IS staffers in which it invests, Monastero says.

"One of the risks for us is being at the leading edge is losing people because they change jobs more rapidly," he notes. "If I'm going to make a significant investment in a person, I need to retain them for five years."

Among the incentives he is developing is a retention bonus, separate from other Xerox vesting programs, that would be payable after the employee had worked at the company for five years.

New flexibility
At Georgia-Pacific, Barker says one way to increase retention is by giving staff job flexibility. "The work/family situation is much more important to people than before," she notes. "Just giving a person a PC at home or a pager helps with this immensely."

Companies and HR managers view such advances as "different companies are ahead in different areas" when it comes to innovative means of recruiting, retraining and retaining IS personnel. Still, he sees a very definite trend emerging: "We've gone from support that has been somewhat tentative [in IS] to the point where it is absolutely critical."

King is a Computerworld senior editor, management.

**Intelligence Files**

**Bank IS spending to grow**

Although U.S. bank information and communications technology spending is expected to grow 1.5% annually beyond the $20.1 billion spent in 1994, investments in branch automation are declining in the past year. That's due to a recent survey by Mentoris Corp. in Melville, N.Y. Olsten polled 1,022 managers on telecommuting.

Investments in branch automation according to the survey, nearly a third of IS professionals had delivered on the productivity promise. Telecommuting is most strongly encouraged at high-technology companies (44%), followed by firms in the services sector (57%), banking/finance (34%), retail/wholesale (39%), insurance (32%), manufacturing (27%), utilities and transportation (22%), health care (20%) and nonprofit public agencies (19%). The study found that IS employees who telecommute have productivity equal to 63% of the average cost of $10,000 per person. Such training, he notes, improves workers' employability at Xerox and elsewhere.

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**Management**

**Seeds of Satisfaction**

Partnerships between IS and HR are resulting in a variety of programs and practices, such as the following:

- **AlliedSignal, Inc.'s**
  - Individual job skills counseling
  - New reward and recognition programs

- **Eng. Materials Div.**
  - Morristown, N.J.
  - Performance-based pay programs

- **Xerox Corp.**
  - Rochester, N.Y.
  - Standardized IS job descriptions and performance measurement criteria
  - IS staff competency reviews and customized retraining programs

- **Georgia-Pacific Corp.**
  - Atlanta
  - Self-nomination of IS employees for vacant positions
  - Employee training in new technologies

- **General Electric Co.**
  - Fairfield, Conn.
  - IS staff training in communication and negotiation skills

- **Chevron Information Technology Co.**
  - San Ramon, Calif.
  - Employee training in new technologies

**New flexibility**

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King is a Computerworld senior editor, management.

**Call me 439864266**

Americans are apparently losing their numbers anxiety when it comes to identification. The latest poll, published by the American Psychological Association in December, 1994, shows that 60% of Americans support the use of a national ID system to curb the hiring of illegal aliens as proposed by a federal commission on immigration reform [CW, Aug. 8, 1994].

The poll, conducted by Louis Harris and Associates, Inc. for Atlanta-based Equifax, found that 70% of the American public generally support the plan. Opponents include blacks, people who say they distrust the government and people whose Social Security numbers have been misused.

**College earns IS laurels**

Cap Gemini America has awarded its first Excellence Foundation Education award to Loyola College in Maryland. The award recognizes the dual focus of Loyola's IS department on business and technology.
BUSINESS, SCHMIZNESS! Give me computers!

Madame X

We've heard it over and over: "Be less of a technician and more of a businessperson."

We read about it in magazines and hear endless entreaties at conferences. Although certainly a noble goal, it's one that most computer professionals won't pursue. Why? Because the time and energy it takes to acquire a high level of business skills takes us from our prime love, our profession do it for a simple truth that all of us will truly results; most managers wait for months or years to there's always something new to learn. We read busi-

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We like computing because it brings order and structure. Unlike the real world, which closely resembles chaos most of the time, computing has a fundamental logic that is appealing. It deals with

We like computing because technology makes life better. Computers have removed much of the tedium from life and have certainly been the basis for in-

We like computing because it makes us feel special. A breed apart

We like computing because it takes us from our prime love, our profession do it for asimple truth that allofus will truly results; most managers wait for months or years to there's always something new to learn. We read busi-

We like computing because machines don't complain. Computers have their

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We like computing because it brings order and struc-

We can break both hard-

FEB. 26-MARCH 4

SAC '95: 1995 Symposium on Applied Computing,

The PC Nightmare Symposium, Orlando, Fla.,

Effective Methods to Manage and Control a Work

Engineering Document Management Systems

Focus '95, Orlando, Fla., Feb. 27-March 2 — Con-

Bringing the Power of Teammates to Your Work.

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Calendar

The Sixth Annual Expanded International Help Desk Conference. San Francisco, March 5-8 — Seven conference forums examine key issues, including planning, implementing and supporting a help desk or related support service. Contact: Help Desk Institute, Colorado Springs, Colo. (719) 513-0138.

MARCH 5-11

The Workgroup Solutions Conference and Expo, Boston, March 5-8 — A guided tour of groupware, including improved electronic meeting facilitation techniques; maximize return on investment; global collaboration; groupware for heterogeneous architectures; automating field personnel; developing workflow applications; integrating groupware with legacy systems; and administration and security issues. Contact: David Coleman, GroupWare '95, San Francisco, Calif. (415) 282-9192.

Convex User Group Worldwide Conference. Dal-

The Workgroup Solutions Conference and Expo.

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Developers like you, for instance. Because of your work, companies and institutions have increased efficiency and productivity. They have been able to accomplish things that were never possible before. And we feel it is high time your accomplishments were recognized by an award of your very own. Therefore, it's our pleasure to announce the first annual Apple Enterprise Awards:

The Apple Enterprise Awards is a global competition designed to honor developers of innovative custom solutions that best employ Apple technologies. Your submission will be judged on how you've delivered an effective custom solution in your organization.

Winners will be announced at an awards ceremony during PC Expo in New York, June 19-22, 1995. Winning solutions will be displayed in the Apple Enterprise Awards booth at the show, and featured in a special supplement in Computerworld.

So call 1-800-396-6877 today to receive your entry kit. The deadline for entries is April 3, 1995. Hurry, because it's not every day that you get a chance to be recognized.

Announcing the First Annual Apple Enterprise Awards
Call 1-800-396-6877 for an entry kit
City of Palo Alto saved from urban blight.
HP SureStore Optical Jukebox gets 48 cabinets of files onto the network and off the floor.

It was not a pretty sight. More than 900 square feet of office space, buried in paper documents. Police records. Building inspection reports. Tens of thousands of files. And with the growing demand for information—and the mounting costs of finding misplaced records—a bad situation was fast becoming a crisis.

**HP SureStore**

Hewlett-Packard had the long-range solution the city desperately needed. An optical jukebox that could safely store every last file onto the network. Since HP optical disks have a 30-year shelf life, the city's records would last far longer than they ever could on paper. And there'd be no danger of running out of storage space. HP optical disks can be removed and swapped—so storage capacity is virtually limitless.

Today archived documents that took city workers days to unearth can now be accessed with a simple touch of a key. And the savings are substantial. Between increased productivity and reduced overtime, the City of Palo Alto figures their HP SureStore Optical Jukebox saves them about $26,000 annually. And frees up $31,000 worth of rented office space to boot.

Are burgeoning archives a blight on your operations? HP has the proven solution. For more information, call 1-800-826-4111, extension 9106.
Who Delivers RAID Storage For The Long Haul?

Ask PC Week.

"...most impressed by the SuperFlex's performance, expandability, and myriad configuration possibilities."

"Storage Dimensions' RAID subsystem outperforms Compaq Smart Array."

"...SuperFlex offers investment protection that should help [CFOs] rest easier."

"Hardware vendors focus little on making their products backward-compatible. The result: Chief financial officers wind up amortizing equipment over five years, even though it's likely rendered extinct in two."

That's how PC Week described the industry in an October 17, 1994 article on storage products. It found one bright spot, however: SuperFlex from Storage Dimensions.

Bucking the trend.

After an in-depth review, PC Week concluded that the SuperFlex RAID system "bucks the trend toward accelerated obsolescence."

The review specifically praised SuperFlex for its investment protection through:

- Modular design to incorporate future technologies
- Simple field configurability and upgradability
- Easy expandability for growing requirements
- Backward (and forward) compatibility of hardware

Superior performance.

What about performance? PC Week Labs benchmarked SuperFlex and Compaq's Smart Array. The result? In I/Os processed, SuperFlex outperformed Smart Array 2 to 1.

SuperFlex uses high-performance, high-reliability Barracuda drives from Seagate.

Non-stop operation.

PC Week also praised the high reliability of the SuperFlex design. With hot-swappable, redundant power supplies, triple fans, on-line spares, and a sophisticated cableless backplane, SuperFlex truly is the "RAID unit designed for the long haul."

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Let us help you buck the trend!

SuperFlex/RAIDFlex™ Combo Delivers Superior I/O

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<td>Higher numbers indicate better performance.</td>
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The growing popularity of RAID is turning the storage market upside down — even for mainframe sites. Traditional direct-access storage device (DASD) farms, where general-purpose devices meet all manner of requirements, are giving way to RAID systems with unique architectures designed to match the specific data-access and storage needs of each site.

Three major vendors are jockeying for position in this new data-driven world. EMC Corp. opened the RAID market with its Symmetrix systems, which use large amounts of cache and software systems to boost performance. The company has taken more than a little business away from IBM, which once owned the DASD market. EMC has also grown at the expense of Storage Technology Corp., which has dragged its feet in delivering its own RAID technology.

Now, IBM's Ramac and StorageTek's Iceberg are being delivered to mainframe sites. These products are creating more choices for information systems managers and reshaping the storage landscape. In this report, Robert Callery, an analyst at International Data Corp. (IDC) in Framingham, Mass., describes how the changes affect your buying decisions. Users of each of the three products explain what led them to choose a particular product. Our Buyers' Satisfaction Scorecard and Firing Line spotlight the views of 119 storage users at large mainframe sites.

This Guide also looks at the midrange storage market, which is rapidly evolving from a proprietary model to an open systems, RAID-heavy structure. Lab tests highlight the challengers in the IBM AS/400 arena, and a roundup chart lists the leading products across the board.

Take note of the radical remaking of this segment of the computer business. It will make your choices for storage harder but provide solutions that better fit your site's unique requirements.
EMC confirmed last week that it plans to deliver RAID-S, a new version of its Symmetrix line in the third quarter. RAID-S will feature RAID 4-plus capabilities.

The product will also support multiple RAID levels and data formats in a single system, sources said. See related story in news.

The EMC product will be delivered in the same time frame as HDS's first RAID 5 offering. HDS will reveal its plans on Feb. 7. StorageTek is also expected to discuss its next RAID product, called Kodiak, in a Feb. 7 announcement.

RAID DEFINED:

RAID stands for redundant array of independent disks. In the mainframe environment, it represents a set of physical disk drives that the operating system views as a single logical drive with data distributed across it. Redundant disk capacity is used to store parity information to guarantee data recoverability in case of a disk failure. RAID was developed and patented by IBM in the mid-1970s.

RAID is divided into five levels. The three most common are:

RAID 1:
- This provides complete fault tolerance. Data can be recovered if a disk fails because two copies are kept.
- The disadvantage is that only half the available space is used for data storage; the rest is for backup. This doubles the cost per megabyte.

RAID 3:
- Data striping.
- This involves spreading the data across multiple disks in the array, with one used for parity. The main advantage is fault tolerance. The data can be recovered if any disk fails. Performance is excellent because there is a high transfer rate for large sequential files.
- While strong in fault tolerance, this level has a disadvantage — if more than one drive fails, you’re in trouble.

RAID 5:
- Data striping plus parity.
- Data and parity are spread across multiple disks in the array.
- Fault tolerance is strong as well as performance.
- Unlike RAID 1, distributed parity decreases the risk of lost data from a single drive failure, but it increases performance penalties for write functions.

In the RAID world, products are built to fit the data. In the past, IBM offered one-size DASD for all needs.

By Robert Callery

Like a tidal wave of change, RAID is sweeping over the large systems storage marketplace and brushing IBM's traditional DASD dominance aside in the process.

In a few short years, Hopkinton, Mass.-based EMC has risen from the fringe of the data center to become IBM's leading challenger for market share. It has done so on the strength of its RAID-like approach to DASD, offering high performance and availability at an affordable price.

Last year, IBM finally answered the challenge with its own RAID system, known as Rambac. StorageTek in Louisville, Colo., also finally delivered its long-awaited iceberg RAID device.

IBM's and StorageTek's systems offer complete RAID compliance, including Level 1 through Level 5. (See RAID definitions at left.) EMC's Symmetrix line, although identified in the RAID category, currently offers only a disk mirroring option as its main RAID component.

These new devices provide dramatically improved performance, reliability and functionality over IBM's traditional DASD. They also provide a radical change in the way storage devices are designed and purchased.

Always charged with keeping corporate data safe, available and quickly accessible, IS managers had a much simpler decision to make as little as three years ago. The only significant issue was determining which vendor to do business with. All suppliers offered similar technology. Some subsystems offered better environmental and performance, but user alternatives were somewhat limited.

But today RAID suppliers are building storage strategies around completely different architectures and designs and are attempting to solve I/O problems with a variety of approaches.

Data first

A short while ago, vendors offered a "one-subsystem-fits-all" solution to businesses. IBM, just one disk generation ago, provided users with a generic family of storage products, the 3380-3 series, which offered one basic level of performance, capacity and fault tolerance in the mainframe environment.

New entrants in the market, such as EMC and StorageTek, began to offer storage solutions revolving around customer data requirements. With IBM following suit, this led to a Copernican revolution in the storage world. However, the focus is now shifting to the data itself instead of on the subsystem that stores data. The characteristics of the data largely dictate the type of disk hardware required

Why I bought this RAID

By Ron Levine

Levine is a freelance writer in Carpinteria, Calif.
TURNED UPSIDE DOWN

and what type of storage device the data resides on.

With this different way of viewing data comes a new way of evaluating storage devices. The main technology choice users are making is between performance and fault tolerance. To date, no vendor has a legitimate claim as champion in both areas. (See Buyers' Satisfaction Scorecard and Firing Line, pages 80 and 82, respectively.)

In the short term, a mixed hardware/vendor strategy continues to be the most prudent one for storage acquisitions. Each vendor offers unique performance and reliability characteristics that satisfy data requirements.

**Pricing advantage**
By maintaining a multiple-vendor procurement plan, customers will continue to have maximum leverage to obtain the best possible pricing. Another challenge for users will be determining whether they should buy new products from other vendors. AMDahl Corp. and Hitachi Data Systems Corp. are poised to bring high-performance, high-availability RAID 5 products to market in 1995.

With both suppliers introducing products based on 3.5-in. disks, there will be similarities in product characteristics such as redundant componentry like fans and power supplies and environmental savings like power and cooling requirements.

These will be dramatic improvements over the capabilities of existing products. While HDS hesitates to go public with details on its expected 1H95 storage announcement, IDC expects the company to introduce a RAID 5 subsystem that is based on 3.5-in. disks and offers subsystem capacities close to 1T byte of storage.

Along with its fault-tolerant characteristics, IDC expects the HDS Scalable Server to offer hot pluggable disks and built-in hot sparing.

In the first half of 1995, IDC expects Amdec to announce a storage product that will operate in MVS and open Unix environments. The product is code-named Warp 9 and will offer multiple users.

**Buying issues, page 84**

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**DIFFERENCES GO BEYOND JUST DATA VOLUME**

<table>
<thead>
<tr>
<th>Data Capacity</th>
<th>Performance</th>
<th>Availability</th>
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<tr>
<td>&gt;200G bytes</td>
<td>High</td>
<td>High</td>
</tr>
</tbody>
</table>

Source: Vendor estimates

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**A VAILABILITY, PERFORMANCE AND A GOOD DEAL**

**ICEBERG**

Announced in January 1992, Iceberg finally began shipping last year. While it is designed to reduce RAID 5 performance penalties, Iceberg's key attributes are high capacity and high availability.

"Once you invest in the software to make RAID 5 work, the disks are cheap. It's also nice to have a box that is an order of magnitude smaller than what it's replacing, thus saving floor space and requiring less air conditioning," he says.

The Iceberg storage system at Alamo is configured for 200G bytes of storage with 512M bytes of memory.

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**COMPATIBILITY AT THE RIGHT PRICE**

**RAMAC**

Compatibility was PMI Food Equipment Group's No. 1 concern in its search for a RAID product last year.

"Whatever we purchased had to use our existing files without modification, handle our database tasks, provide the response times we required, have high-availability and equal the present total capacity, plus give us some room to grow," says Ray Florence, director of PMI's Corporate Data Center in Troy, Ohio.

PMI, a manufacturer of restaurant food processing equipment, replaced two 3390 Model 3s, one 3390 Model 9 and an older 3380.

The firm wanted something that could use the existing controllers and the 3390 data structures as is and was compatible with its IBM ES/900 mainframe system. Cost was important, but compatibility was the main issue.

These requirements led PMI to choose IBM's RAID product, Ramac, last October. The installation went smoothly and without any problems, Florence says. "It's great to have just one little box sitting there humming, replacing a string of big heavy ones," he says. "We looked at StorageTek's and EMC's offerings but we were concerned about the controller issue and selected IBM. They gave us the best deal with compatibility and cost."

The installed Ramac configuration is a 3390E 113 with 13 drawers. The system can be expanded to 16 drawers, with a capacity of 90.5G bytes of storage.

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**USER PROFILE**

**ICEBERG**

Availableility, performance and price compelled Alamo Rent A Car, Inc. in Fort Lauderdale, Fla., to select StorageTek's Iceberg subsystem.

But the race was close, says Tom Loane, vice president of computer and communications services at Alamo. IBM's Ramac and Iceberg systems are similar in many aspects, Loane says. "It just happened that StorageTek had the best deal the week we went shopping."

Loane also looked at EMC's Symme-

teric. "EMC also has a good product, but it does not perform in our environment. Our use is write-intensive, and we felt it was not right for us," he says.

Alamo considered traditional DASD before it selected the RAID system. But the economics were 100% on the RAID side; it's a lot cheaper than conventional DASD, Loane says.

"Once you invest in the software to make RAID 5 work, the disks are cheap. It's also nice to have a box that is an order of magnitude smaller than what it's replacing, thus saving floor space and requiring less air conditioning," he says.

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**THE CW GUIDE TO RAID STORAGE DEVICES**

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**BUYING ISSUES, page 84**

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**Source:** Vendor estimates

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The CW Guide to RAID Storage Devices

BUYERS’ SATISFACTION SCORECARD:
RAID heavyweights duke it out

BY KEVIN BURDEN

The Super Bowl may be over, but the battle for market dominance in high-end RAID still rages. Will the winner be first-to-market EMC Corp., with its established Symmetrix line? Or will it be the company no one dares call an underdog, Storage Technology Corp., with its long-awaited Iceberg?

And can IBM regain its dominance in data center storage with its newly delivered Ramac large systems RAID storage device?

According to International Data Corp. (IDC) in Framingham, Mass., EMC and IBM will each ship almost 34% of the total terabytes of mainframe storage this year, compared with just 19% for StorageTek. But most important, this market now has more than one contender.

Computerworld’s user evaluations indicate that each product has an edge in certain areas. Symmetrix tops the performance ratings, while Iceberg and Ramac share the lead in reliability. A user analysis of Iceberg and Symmetrix follows. For the story on Ramac, see Firing Line (page 82).

Iceberg

The Iceberg 9200 Disk Array Subsystem has been the most anticipated storage product ever released. StorageTek did a lot to help build the hoopla by teasing the market, announcing one release date after another. However, as the product’s user satisfaction scores show, Iceberg may have been worth the wait.

Iceberg’s highest score was awarded for recovery from failures. It is a true RAID 5+ implementation, which means parity data is spread across all drives in the array, allowing Iceberg to take a hit on any two disks and still reconstruct the data.

Beyond RAID 5, Iceberg provides full fault tolerance at all levels of the system, including power, fans, cache memory, controllers and disk drives. “With an Iceberg running the way it’s designed to run, it should be fully fault tolerant and you should never suffer a failure,” says Bob Callery, research manager for storage and peripherals at IDC.

Iceberg’s major liability is its poor rating for ease of use. The system is very complex, says Paul Wolfstaetter, an analyst at Gartner Group, Inc. in Stamford, Conn. “You don’t install an Iceberg unless you send your people to [StorageTek’s] school in Colorado for a couple of weeks.”

Iceberg’s sealing flexibility helped it receive a high grade for capacity. Users can add 500-byte upgrades to the 1000-byte base capacity, up to the full capacity of 4000 bytes, before they need to purchase a new frame and controller.

Iceberg has also reduced the RAID 5 write penalty associated with locating and updating files in the same physical location. Iceberg employs a concept called the log-structured file system that rewrites the data in available free space elsewhere, then purges the old file.

While this reduces the write penalty, there is a potential trade-off in performance. As the in-use capacity of an Iceberg subsystem grows, its ability to quickly locate available space decreases, according to Callery. “When the in-use capacity gets up above 85%, the system spends too much time trying to collect free space, and that can affect its performance,” he says.

Iceberg’s speed, however, received favorable ratings, which indicates that users are either keeping the use below the 85% in-use threshold or carefully managing its capacity.

Part of what makes Iceberg different from its competition is its virtual direct-access storage devices (DASD). Conventional DASD requires spaces between written data so the read/write mechanism can work. Iceberg uses compression technology on the front end, which eliminates the need for gaps.

“What the compressed data means that you get more data stored per gigabyte, and because you’re sending compressed data down the channel, it can actually improve its performance,” Callery explains.

Symmetrix

The Symmetrix series, while not considered true RAID technology, employs a mirroring technology similar to RAID 1 that creates a copy of all its stored data. But unlike Iceberg’s fully fault-tolerant setup, Symmetrix depends on intelligent software to detect potential failures and move threatened data to spare disks before it becomes a problem.

“It’s not as fault tolerant as Iceberg, but because the software constantly monitors the system, Symmetrix automatically fixes itself before data is lost,” says Dick Wilmut, editor of the “Independent RAID Report” in Lafayette, Calif.

Its intelligent software also contributes to its ease of use. “Symmetrix takes over a lot of the control. You don’t have to do any cache tuning or issue any commands. You just turn it on, and it does most of it for you,” says Tom Miller, a senior technical analyst at St. John’s Hospital and Medical Center in Detroit.

Symmetrix’s total possible capacity is an ample 3600 bytes. But its rating indicates that users are less than completely satisfied, which could be due to mirroring. Because every piece of data is written twice, one can store only half that amount, Wilmut explains.

Possibly bringing down the capacity score further is Symmetrix’s method of expansion. Unlike Iceberg’s more granular upgrade, where additional units are wheeled and plugged in for every added 1000 bytes, Symmetrix’s upgrade is not as easy.

“You have to add more [Head Disk Assembly] and other internal components,” Callery says.

But what makes Symmetrix so unique is its brute force method of including a lot of resources to solve I/O problems. For example, Iceberg increased its maximum cache to 16 byte, but it still has only one quarter of what Symmetrix contains.

Data stored in the cache can be retrieved much faster than DASD data. Users can write data to cache or rely on Symmetrix’s intelligence to detect highly active data and place it in cache.

User ratings: An almost even split

<table>
<thead>
<tr>
<th>Category</th>
<th>EMC Symmetrix</th>
<th>IBM (209)</th>
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<td>BASE: 38 users</td>
<td>BASE: 32 users</td>
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<tr>
<td>TOTAL SCORE</td>
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<td>6.3</td>
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<tr>
<td>COST</td>
<td>6.2</td>
<td>6.6</td>
</tr>
</tbody>
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* Includes a variety of models. Sixty-eight percent of the users rated 5500 class systems.

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Leading the Peace Movement
Designed for IBM's 3390 direct-access devices, Ramac, with IBM's 3990 controllers, but it also ties performance to the previous generation of technology. The controllers were designed for IBM's 3390 direct-access storage device (DASD) products. "We looked at EMC and StorageTek, but in the final analysis it came down to cost," says Raymond L. Florence, corporate data center director at PMI Food Equipment Group in Troy, Ohio.

Despite the legacy controller, Ramac provides much enhanced performance over 3390 DASD, evaluators for this FIRING LINE reported. But it also requires twice the initial load times cited by IBM. Evaluators included a financial services firm, a manufacturer, a health care provider and a utility. The format was developed with help from Howard Rubin and Associates and International Data Corp.'s Technology Investment Strategies Corp.

Fault tolerance
Ratings for fault tolerance were based on the evaluators' tests of Ramac's fault-tolerant capabilities because users had no failures at the time of the evaluations. Ramac duplicates the power supplies in the rack. Each drawer has two fans and its own battery, making the cache nonvolatile. This plus Ramac's RAID 5 implementation instilled a high level of confidence in the evaluators.

Manufacturer: "We tested the dynamic sparing feature before we fully populated the database, and it worked as billed." Dynamic sparing maintains data availability by automatically copying data from a failing drawer to a designated spare drawer.

Financial services: "The mean time between failures, according to IBM, is 1.5 million hours for one disk. But the probability for a failure increases by the number of disks, which for us is about 50 disks. But even that is only about one every two years."

Ease of use
Contributing to Ramac's ease of use was the evaluators' familiarity with IBM's 3390 storage technology. Ramac's installation was not an issue because it was done by IBM. However, microcode changes made to the controllers were not effectively communicated to users. This caused the data's initial load time to be longer than IBM had predicted.

Manufacturer: "It was very easy for us to use because it's just like the 3380s we had. But the initial load time for each address, which IBM said would take only 20 minutes, took almost an hour. We eventually fixed the problem through some code changes."

Capacity
None of the evaluators had grown Ramac to the full 90GB-byte capacity, although all said they expect to. The ability to run two Ramac systems off one controller made the evaluators comfortable with Ramac's scalability, but most felt left in the dark about IBM's plans to move to double-density disks.

Utility: "We only have 13 of 16 possible drawers in right now, so we can still grow it a bit further before we need to roll in another Ramac. And even then, we are still able to hook it up to our existing controller."

Financial services: "There are unknowns about whether [IBM] is going to come out with the double-density disks or not. I could add another 90GB bytes today, but not [until] I know their plans."

Speed
Ramac performance relies heavily on the attached storage controller. Evaluators using 3990 Model 3 controllers had throughput improvements as high as 50%. And while IBM says Ramac's performance is comparable in most situations to a 3990 Model 5 with a Model 6 controller, users using the Model 6 controller with Ramac also saw improvements.

Financial services: "We were using a 3990 Model 5 in conjunction with a 3900 Model 3 controller and were getting a response time of 16 msec. With Ramac on our [3990] Model 3 [controller], we were getting 8 msec response times."

Cost
In past years, the competition has used price against IBM. But now IBM includes small to medium-size companies among those customers it's willing to bargain with. Manufacturer: "Their competition has been eating them alive here for a while. But now they're starting to deal. You have to fight hard and long, but we normally have been winning."

Burden is Computerworld's senior researcher, FIRING LINE/Scorecard.
OPEN SYSTEMS RAID SWEEPS INTO THE MIDRANGE

BY AVERY L. JENKINS

As the market for RAID storage continues to grow across the board, midrange RAID vendors are sporting a new open look for their systems.

Midrange RAID storage, whether supplied by the system manufacturer or a third-party vendor, formerly focused on the single-system environment. If you wanted RAID for your VAX, you bought system-manufactured RAID for your VAX, you bought system-manufactured RAID from Digital Equipment Corp. or Micro Technology, Inc. If you wanted RAID for your AS/400, IBM or XL/Datacomp, Inc. would supply it.

Today, however, the single-vendor paradigm has fallen by the wayside. Vendors have heeded the need for fault tolerance and high performance/high availability and are now providing RAID storage systems that can often support multiple computing environments in a single storage subsystem.

This form of open, centralized RAID storage "makes it easier for users to manage their total storage environment," says Tom Lahive, direct-access storage device (DASD) subsystem analyst at International Data Corp. (IDC) in Framingham, Mass.

In addition, "users can keep their dollar-per-megabyte costs low because of higher volume purchases" for the centralized storage server, Lahive adds.

For the vendor, such an approach makes good economic sense. While the DASD market for the midrange remains relatively large — for example, IDC values the AS/400 DASD market at about $1.9 billion annually — growth overall is flat.

Why RAID?
Companies forging ahead with open systems strategies once saw little need to equip their midrange systems with RAID devices even though they were worried about the gaping holes in the systems' ability to provide reliable, storage for far-flung servers.

As mission-critical applications continue to migrate from the mainframe, the need for fault tolerance and high performance/high availability is traveling with them. Thus, midrange data protection requirements are taking a different form today than in past years. In addition, both small and large information systems organizations must manage ever-increasing amounts of data in shrinking storage floor space.

High availability and fault tolerance in a small package are the basic promises of RAID devices.

Buying disk insurance
Despite the move toward open architectures, the system is still the first place most users turn for storage support. Compatibility and security with installed systems are key drivers of this trend.

IBM, Digital, Hewlett-Packard Co. and Data General Corp. all supply internal RAID storage for their systems. "Some midrange vendors can offer five bays of internal storage," which translates into 10G bytes to 20G bytes of disk space, Lahive says.

The open systems approach is providing users with more options, however, especially among third-party suppliers.

Third parties are competing with the systems vendors by "selling RAID with a lower cost-per-megabyte and higher functionality," Lahive says.

Micro Technology, for example, has been a mainstay in the Digital RAID market for several years, with its ability to connect to Digital's proprietary busses. More recently, it has expanded its StorageWare servers to support Ethernet, Fiber Distributed Data Interface, Unix and Network File System computing environments, among others.

Likewise, EMC Corp. has also expanded beyond the mainframe market to provide midrange RAID storage for Unix and a variety of network operating systems.

Spotting the differences
The move to support open systems has not obliterated the differences among the products. Among the systems vendors, IBM and Data General are generally considered the leaders.

IBM "is an overlooked success. They have shipped more of their RAID products — 50,000 units — than all of the other vendors combined," says Mike Kahn, chief executive officer of the Clipper Research Group in Wellesley, Mass. "IBM was one of the early leaders in the midrange, in particular."

Data General's Clarion RAID line is "very solid," says Farid Neema, president of Peripheral Concepts, Inc., a market research and consulting company in Santa Barbara, Calif.

And while analysts regard Digital's products as technically strong, the company is not a strong force outside of its own installed base.

"Somebody who has been buying storage from Digital would be comfortable buying RAID from Digital," Kahn says.

Digital uses a "very modular hardware approach, and they have included software and hardware."

Midrange systems, page 84

XL/Datacomp most reliable, EMC lowest priced

Early field test results from AS/400 sites place XL/Datacomp's 9638 Model 140 at the top of the pack in terms of reliability for four leading RAID devices. The product, which has been available for about four months, achieved the best mean time between failures total of all the models. EMC's Harmonix: HX3SR Model 4 achieved the second-best total with less than three months in the field.

Sites surveyed by Reliability Ratings in Needham, Mass., reported that XL/Datacomp's 9638 was strongest in performance. EMC's users were happiest with reliability and performance.

Fault tolerance was also the high point of IBM's 9337-225, with capacity and price being the weaknesses.

IPL accumulated the shortest mean time between failures of the four devices. All but one of the failures occurred on the 7037 Model 40. Overall, the IPL sites cited price/performance as the strength and service as the main weakness.

Prices for the devices were typically below $2 per megabyte, with one EMC site reporting $1.70 per megabyte for 24G bytes of DASD. Some sites reported discounts as great as 30% to 40% off the list price.

<table>
<thead>
<tr>
<th>PRODUCT</th>
<th>TOTAL HOURS IN USE</th>
<th>FIELD MTBF (in hours)</th>
<th>ANNUAL FAILURE RATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>XL/Datacomp 9638-140</td>
<td>575,904</td>
<td>575,904</td>
<td>1.40%</td>
</tr>
<tr>
<td>EMC Harmonix H3SR Model 4</td>
<td>1,168,128</td>
<td>389,376</td>
<td>2.07%</td>
</tr>
<tr>
<td>IBM 9377-225</td>
<td>487,200</td>
<td>243,000</td>
<td>3.31%</td>
</tr>
<tr>
<td>IPL Type 7000 Model 40</td>
<td>1,037,540</td>
<td>148,220</td>
<td>5.44%</td>
</tr>
</tbody>
</table>

*MTBF: Mean time between failures in terms of number of hours in the field.
**Annual Failure Rate: The number of hours in a year, 8,064, divided by the MTBF in hours.

Source: Reliability Ratings, Needham, Mass.
**The CW Guide to RAID Storage Devices**

**Midrange systems**

CONTINUED FROM PAGE 63

ware for backing up hierarchical storage management systems," Neema says.

Of the third-party vendors, EMC and its recent Centriplex announcement have gained the most attention.

"The important thing about EMC is its flexibility and its ruggedness," Neema says.

Dynamic load balancing, in a RAID context, allows a RAID array that is partitioned into different RAID levels, such as RAID 1 and RAID 5, to change the partitioning automatically, on demand and without stopping the system, Neema says.

Overall, however, the technical differences among the products are less important than other issues such as stabiility and support.

RAID "is a price and reputation game," Kahn says. "You are buying security… Security comes more from buying a well-known name than a name you find in the back of a magazine."

---

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  PROFIT: $25.5 million SHARE: 1.0%

**Buying issues**

CONTINUED FROM PAGE 79

er-configurable levels of RAID, including RAID 5.

The product will use 3.5-in. disks and 4G bytes of Hard Disk Assembly; capacities should exceed 17 bytes of storage in a fully configured subsystem. IDC expects high levels of scalability and performance, as well as high levels of reliability and fault tolerance.

The outcome of these announcements in the already crowded large systems storage arena will create even more intense competition for end-user storage business. While these new products ensure HDS and Amdahl will not be left behind established storage suppliers from a technological viewpoint, IDC does not expect their market shares to change dramatically during 1996.

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Jenkins is a freelance writer in Ansonia, Conn.
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Networking Products
   a) Yes
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52. Other Professional Management
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   e) Unix

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Networking Products
   a) Yes
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COMPUTERWORLD
Coming in the February and April issues of Computerworld Client/Server Journal...

Cover Story: Can DCE Deliver?
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How this industry is capitalizing on client/server networks to help them provide new revenue-generating products and services while streamlining costs.

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Our Test Drive feature takes a look at Personal Oracle 7.
Firing Line reviews Sybase database management tools.

Computerworld’s bimonthly magazine on distributed computing gives you the blend of technology, managerial issues and business strategy involved in its deployment across the enterprise.
OpenDoc vs.

"OLE's roots in application linking make OLE apps large, slow and unnatural for users and developers."

By Cliff Reeves

Comparing OpenDoc with OLE/COM is like comparing a modern human with a Neanderthal. There are similarities. If you were to dress a Neanderthal in a suit and stand way back, the two might even look the same. But you would have to look much closer if one was going to help run your business.

Being competitive means being able to react and adapt to change quickly. Component software holds the key. OpenDoc was designed to build flexible applications based on components. On the other hand, Object Linking and Embedding (OLE) and its Common Object Model (COM) were designed to link the monolithic, general-purpose applications of the past. OLE/COM represents an earlier branch on software's evolutionary time line.

A component standard must evolve smoothly and be widely available and easy to use. OpenDoc is the only software component standard available that meets this criteria. It is available today for Windows, Mac OS and OS/2. IBM has announced plans to make it available for Unix systems, OS/400 and MVS.

Novell, Inc.'s WordPerfect, Apple Computer, Inc. and IBM have shipped developer's kits to more than 54,000 developers worldwide. Many software vendors, including Taligent, Inc., Adobe Systems, Inc., Novell, Apple and IBM, will ship OpenDoc components and tools in 1995.

The software that provides a competitive edge for businesses is a rich brew of commonplace and specialized parts. We'll buy some parts off the shelf; systems integrators will customize others; and we'll handcraft a few ourselves. This open mix-and-match environment will increase application flexibility and reduce costs. OpenDoc is built for this environment.

OpenDoc raises the bar for user and developer functionality. It provides the following set of functions by which you must judge any component technology:

- **Object management services**, based on IBM's System Object Model (SOM), that comply fully with the Object Management Group's (OMG) Common Object Request Broker Architecture. These services enable components to be accessed and protected wherever they are. You can add or replace components at will, reacting quickly to fleeting business opportunities.

- **Component services**, based on Apple's Bento file format, that are widely used by Lotus Development Corp. and others. These services enable users to save and exchange component data. As one department develops new business information, other departments can act on that information quickly. Component documents and automation services, which include Apple's Open Scripting Architecture, enable developers to customize applications easily and reduce the cost of training users.

- **Compound document and automation services**, which include Apple's Open Scripting Architecture, enable developers to customize applications easily and reduce the cost of training users.

OpenDoc was designed to grow smoothly for developers and users so applications can pick up new features quickly and inexpensively. Thomas J. Mowbray, lead scientist at Mitre Corp., recently commented on this flexibility in the November/December 1994 issue of Object magazine. He observed that, unlike OLE/COM, OpenDoc was "designed with extensible architectures that do not require substantial revision to support specialized application requirements." This is because OpenDoc was designed for extensible components — real objects — rather than for applications.

A big hindrance OLE's COM — the way OLE developers must define their components — just makes things harder. It is a specification (not an implementation) that each developer must implement, yet it prevents developers from efficiently extending components by subclassing them. COM has so many restrictions that Digital Equipment Corp. has taken on the task of fixing it.

OpenDoc was developed concurrently on multiple platforms and will adapt to the software and network services you need to run your business. For example, WordPerfect OpenDoc, page 88
In Depth

OLE/COM

"With OLE, I know my investments in software and training won’t be lost."

By Robert Bismuth

There isn’t much argument in my mind who wins the OLE/COM vs. OpenDoc war. Object Linking and Embedding (OLE) beats out its rival from both a business and technical standpoint, so much so that this war is a pointless waste of time and effort.

The advantages of using OLE include a clear evolutionary path from today’s most popular personal productivity applications to "componentware." And its distributed Common Object Model (COM) provides a path to distributed objects.

Both OLE/COM and OpenDoc have the goal of facilitating componentware—that is, software modules from multiple vendors that can be assembled to create applications. The idea is to let users access different application tools in the same document. Both technologies use software objects, and both plan to provide support for distributed objects.

But while OpenDoc is still in its infancy—source code is just now shipping—OLE has been out there since the spring of 1991. OLE is available on Windows, Windows NT and Mac OS.

Think of it this way. If you’re a technical manager in a large user organization, what would you bet on: newly minted (do I dare say untried?) OpenDoc, or OLE, complete with its Microsoft Corp. clout and installed base of Windows developers? About 60,000 OLE software developer’s kits were shipped before the kits were bundled with Visual C/C++, and many more have gone out since then.

OLE 2.0 also has the force of hundreds of independent software vendors creating user products; at Comdex/Phil 1994, Microsoft’s developers list contained 433 companies shipping OLE applications.

Microsoft (and the Windows de facto standard) are so well established that it is hard to imagine throwing out the current investment and turning to fledgling OpenDoc. It just doesn’t make financial sense.

Technically speaking, OLE is a beauty. The object technology underlying OLE, Digital Equipment Corp./Microsoft’s COM, is much more constant than that found in OpenDoc. Every OLE object is by definition a COM object. And the network distribution of objects that today exist only locally has been a major COM design goal.

So far, OpenDoc alpha releases have used C++ libraries for object support. Subsequent releases will move to IBM’s System Object Model (SOM) and then to Distributed SOM (DSOM). Talk about driving developers crazy; they will have to learn three different programming models as they move from C++ to SOM to DSOM. In contrast, COM is COM, including in networked environments.

OLE is not only farther along the path to componentware and distributed objects, but it also has the clearer path.

Take the issue of being able to determine an object’s functions without any prior knowledge of the object—an important aspect of componentware. COM’s built-in query interface capability addresses this and, again, was designed to work efficiently in a distributed environment.

OpenDoc has grappled on a similar mechanism in its C++ libraries—you make a special call on an object asking it whether it supports an extension. If it doesn’t, it says so. If it does, it returns a pointer to a new extension object that has the desired function. Sounds just like the query interface features in COM, doesn’t it? It’s curious that even though SOM/DSOM proponents denigrate this COM capability, the plan is to include something like it in the SOM/DSOM iteration of OpenDoc.

Unfortunately, OpenDoc’s query-interface-like feature will be much more complex, and, because it is not built-in, SOM/DSOM will require an unknown amount of extra network traffic to support it.

OpenDoc proponents brashly say OpenDoc is revolutionary while OLE is evolutionary. Give me OLE’s evolutionary approach every time; revolutions tend to be painful and bloody for all concerned. With OLE, I know my investments in software and training won’t be lost. I know my old interfaces will continue to receive support. With OLE, people can evolve their computing infrastructure at their own rate.

When you look at some of the "revolutionary" aspects of OpenDoc, they don’t stand up to OLE’s comparable approaches:

- Object activation. OpenDoc touts its "inside-out" object activation, in which all objects must be activated before a user can open them.

OLE/COM, page 88
OpenDoc
CONTINUED FROM PAGE 86

OpenDoc has added functions that enable OpenDoc components to work seamlessly with OLE applications and vice versa. In 1995, IBM will extend its SOM network support to include the Open Software Foundation's Distributed Computing Environment naming and security and the OMG's transaction services.

In contrast, Mowbray says, OLE/COM will be suitable only for Microsoft's desktop systems and proprietary tools. OLE is further tied to Windows because "COM's APIs are heavily dependent upon Microsoft's C++ implementation," he says.

Microsoft says it will implement distributed OLE in Cairo, which is presumably now delayed in the same way as Windows 95.

OpenDoc makes users more productive and lowers training costs because it is efficient to use. OLE's roots in application linking make OLE applications large, slow and unnatural for users and developers. For example, no OLE component can exceed a page in length, one cannot overlap another, and each must be rectangular in shape. Also, only one OLE component can be active at a time.

Microsoft has committed to fixing these problems, but past history shows its heritage of missing features, frequent and disruptive upgrades, inconsistent implementations and bloated systems that perform poorly.

So, there you have it. If you plan to use only Windows, if all your software is off the shelf, if your business doesn't run a network and if you don't mind replacing your software every two years, then hire the Neanderthal.

OLE/COM
CONTINUED FROM PAGE 87

view the document. That leads to long start-up times. Some users may appreciate how long it takes to open a document (they'll have time to get coffee), but most will not.

And that's when the objects are local. Imagine how much longer start-up will take when objects have to be retrieved from across the network.

Inside-out activation also requires the presence of a part editor or viewer for each type of object. While Component Integration Laboratories (OpenDoc's sponsor) encourages OpenDoc parts developers to provide free viewers, this is not a guarantee. If the local editor/viewer is unavailable, the user is stuck. The object cannot be displayed at all, leaving a hole in the document.

OLE supports object activation as needed (even all at once, if you want). It also provides for a "last view" of an object so that any application (or stub handler, available on every OLE/COM system) can present a foreign object as a visible, known quantity, even if it cannot be edited locally.

• Application vs. component integration. OLE was designed to integrate applications; OLE controls provide evolution to componentware. That's because the OLE application can run stand-alone or as part of a collection of components, whichever makes more sense for a business. OpenDoc parts function only in the OpenDoc environment, leaving users of today's applications in the lurch.

OpenDoc proponents realize OLE is used everywhere for compound documents today, so its backers have promised to add OLE support. How interesting. Unfortunately, adding OLE support means adding yet another layer of software to access OLE/COM interfaces. What will pay for all this? The cost will likely get passed on to whoever invests in or buys OpenDoc.

Forget OpenDoc. OLE/COM provides more capability today.
That's quite a title. What does it all mean?

"In a nutshell, our charter is to facilitate the adoption of modern software engineering practice using object technology at Xerox Corporation. My team, the OTCC, is responsible for managing the architecture and design of distributed object services that support the rollout of all new globally deployed applications."

How long have you been working with object technology?

"Longer than I like to think. I started using object-oriented languages back in grad school, and my career has evolved around open systems and leading edge software principles and practices. So my experience in software development is based on understanding systems and leading edge software principles and practices. So my experience in software development is based on understanding process, selecting and using the proper abstractions, and focusing on design rather than code. I joined the OMG board in 1989 and have been an active member of the distributed object system community since then."

What changes have you seen as OT has moved into the mainstream?

"Well, the big impact on our work at Xerox is that the scope has expanded to include organizational learning, the impact of technology on corporate culture, reward and recognition for object-oriented development, high performance team building, collaborative work environments, effective mentoring and training techniques, and transformation of business processes into actionable systems."

How does Xerox put object technology to work?

"First and foremost, Xerox has challenged itself to be business-process driven. Our motivation for using objects is to continue to provide the best products and services to our customers. This is not technology for technology's sake. As a result, we embarked some time ago on a company-wide reengineering drive that resulted in the Xerox Business Architecture. And it's in this context that we're using OT. The object approach gives us the opportunity to analyze and design business processes down to the work flow or task level, then easily translate the products of analysis into application design, development, and deployment."

What led Xerox to adopt object technology?

"The decision to adopt OT was made prior to my arrival at Xerox. Our worldwide CIO, Pat Wallington, and her team created IM2000, a set of key strategies to guide our information management into the next century. Our adoption of OT has been leveraged off the strong tradition of software analysis and design practices within IM and our divisions. Our legacy outsourcing agreement with EDS has provided us with a tremendous opportunity to engineer business processes, integrate technology, and build new global solutions designed to make our business more effective."

What kind of benefits has Xerox realized from employing OT?

"Most of the OT work I've been describing here is now in progress. Some earlier pilot activity inside Xerox has yielded a high degree of reusability for both code and designs, quicker time to market, and a high developer productivity and satisfaction. One side effect of OT is improved communications. OT enables us to discuss the solution to the customers' problems in their own vocabulary."

What will people learn about OT at your Object World sessions?

"The first is an evangelical session highlighting the benefits and realities of a migration to object technology, and adoption. I'll describe the critical success factors for corporate-wide OT adoption. I'll also provide a real-world, large-company perspective on the benefits and realities of a migration to object technology, and an understanding of the relationship between business process management, object technology, and solutions deployment. My sessions will give them a head start on realizing the benefits of OT for their companies and themselves."
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Calming Windows anxiety

The fear of leaving mainframes behind and learning Windows development is valid, but it doesn’t have to be crippling

By Dana P. Crenshaw

It’s been seven months since I began developing Windows applications, and I admit the transition hasn’t been paint-free. Five years of mostly mainframe development had tilted me to a certain way of thinking and programming, but with hard work and plenty of initiative, I made the transition.

Admittedly, the technology is difficult, but don’t let anyone kid you. The fear of failure can be debilitating. For me, failing at an opportunity to develop for Windows meant being sentenced to old technology with an uncertain future. But once I started, my confidence grew.

Overcoming the initial anxiety was only the initial hurdles, the new challenges were aggravating nonetheless. For me, an especially frustrating contrast was the location of the program code. On the mainframe, code resides in one file. This file houses related functions and procedures, making it easy to read and debug. But this is not the case in Windows.

Windows applications have objects. Each object has code that enables it to carry out a task completely. Where I used to have one file containing hundreds of lines of code, I now have small independent packets of code with maybe 20 lines. Mentally, this takes more effort to maintain lines of code, I now have small independent packets of code with maybe 20 lines. Mathematically, it takes more effort to maintain the big picture from within a tiny test tube. This forces me to make sure each individual part is complete within itself. In other words, emphasis is placed on the parts that make up the whole.

Another disturbing difference was the lack of control I had over the program’s flow. On the mainframe, I could code a "DO WHILE ... ENDDO" or a "FOR ... NEXT" sequence that would be in control. Any other program that needed resources had to wait until my program finished. This also limited the user to running one operation at a time. In contrast, the Windows environment maintains control, allowing it to respond to other applications that request its resources.

Not only does Windows force me to be unseelshait, but it also helps me write intelligent code — code that is sensitive to the environment and the user.

Smaller hurdles

Not every challenge is a major one, however. The design of flowcharts, for example, is slightly different. Honestly, I’m still working on this one. A flowchart for Windows applications seems to consist of a set of disjointed flowcharts for each function the user could perform. The functions are all self-contained.

Another is the use of buttons rather than function keys. On-line mainframe applications rely heavily on function keys to initiate actions. Windows has buttons that serve the same purpose except that the code lies behind the buttons and carries out the function completely. These are minor differences, but they’re frustrating if they catch you by surprise.

I’m still learning, of course, but the more I read about and study Windows, the less I worry about failing.


I’ll no longer rely solely on my mainframe programming background. I knew that Windows was a different animal, and if I wanted to tame it, I had to learn some new tricks.

Crenshaw is a senior staff consultant at Orkand Corp. and a freelance writer in Atlanta.
Outsourcing, But Always a Dirty Word

Systems administrators find opportunity in unlikely places

By Leslie Goff

For awhile, it looked like outsourcing—what was once a displace systems administrators, but supply-side economics is playing out in their favor. Outsourcing firms need more people with administrative skills than are available. Recruiting is heavy, and salaries are skyrocketing.

Moreover, the opportunities are plentiful across the board, whether you come from traditional mainframe and midrange systems administration or an open systems, distributed technologies orientation.

That's because systems administration is evolving from a low-growth position associated with legacy systems into a key career path. "We look at the position more as a systems management and administration," a position more on the network side of the house," says Rick Schwartz, a program director at BSG, a consulting firm in Houston. "The responsibility is heightened because the function is more complex."

Outsourcing firms are looking to both sides of the skill pool for talent: traditional data center administrators with exposure to networking and open systems and network administrators who have experience with centralized management tools.

Administrators with distributed systems expertise clearly have the upper hand, especially if they apply directly to outsourcing firms. But traditional systems administrators who show initiative have similar opportunities.

When a company chooses to outsource systems administration, it typically makes a deal with the vendor to absorb existing staff for a required time. If you find yourself in this position, use this period to learn more about client/server technologies, Unix-based systems management tools and basic networking principles.

Outsourcing executives say staffers who demonstrate the drive and ability to adapt their skills to a distributed environment can take their careers further in a vendor firm than in a client firm.

"You have a broader level of opportunity in an outsourcing company," says Scott Lahti, president of the outsourcing operations division at Systematics Financial Services, a subsidiary of Systematics Information Services, Inc. in Little Rock, Ark. "We still have a need for traditional systems administration, but we also have other positions available that are more LAN/WAN-oriented, so that's another avenue for career growth."

Lahti won't comment on specific hiring projections for this year but notes that Systematics, which has traditionally targeted financial services companies, is expanding into health care and telecommunications.

Meeting demand

Electronic Data Systems Corp. is another outsourcing vendor that is trying to bring together both systems and network administration skill sets. The company's client/server technology services group, which has 1,300 employees in 30 locations worldwide, this year will hire "hundreds" of systems and network administrators for a two-pronged approach to systems management, says Dan Shubert, director of the group. At least one company has experienced so much demand that it has formed a division dedicated to systems administration.

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<table>
<thead>
<tr>
<th>Region</th>
<th>Phone Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northeast</td>
<td>+1-315-463-6276 or (800)214-7583/Fax: (315)-663-0437</td>
</tr>
<tr>
<td>South</td>
<td>+1-404-263-3409 or (800)778-2159/Fax: (404)-263-3434</td>
</tr>
<tr>
<td>Midwest</td>
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<table>
<thead>
<tr>
<th>Category</th>
<th>Projected Percent Change</th>
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<tbody>
<tr>
<td>COMPUTER SOFTWARE</td>
<td>7.6%</td>
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<tr>
<td>COMPUTER HARDWARE</td>
<td>6.1%</td>
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<tr>
<td>MODERN FACTORY TECHNOLOGY</td>
<td>6.1%</td>
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<tr>
<td>BUSINESS INFRASTRUCTURE</td>
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<tr>
<td>ENVIRONMENTAL</td>
<td>1.6%</td>
</tr>
</tbody>
</table>

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The words "small," "cheap" and "RAID" have seldom been mentioned in the same breath, but the differences between RAID products for mainframe and server-level systems are becoming few and far between.

No longer separated by a vast technological gulf, the two markets now provide remarkably similar disk array products. More important, users no longer dismiss RAID for PCs and servers as frivolity. "The only areas where vendors might skimp at the low end is in having less redundancy for fans and power supplies," says Phil Davin, vice president and chief analyst at Dataquest, Inc. in San Jose, Calif. Moreover, RAID's cost is dropping.

Designed to protect against system failure by storing data across multiple drives, RAID has grown in value as critical applications and information are increasingly placed on departmental servers. "A year or two back, many people still thought [low-end] RAID was like snake oil," says Bill Frank, president of Augur Corp., a manufacturer in Fremont, Calif. "They weren't sure they could rely on NetWare's RAID functionality. "No one has made redundancy and RAID safe choices that are easy to integrate," says Dan Friedlander, a storage consultant in Boulder, Colo. In fact, Novell has made RAID so easy it is often all but invisible, Frank says. "Most Novell users we survey don't identify themselves as having RAID. But if you ask them about mirroring — which is by definition RAID Level 1 — they will say, 'of course.'"

When moving beyond NetWare RAID, however, the choices quickly become more complex, says Mike Casey, vice president of storage research at Computer Intelligence InfoCorp in Santa Clara, Calif. But "it really depends on what you're trying to accomplish."

To pick a system, it is important to have a clear idea about the disk access time required as well as what data really needs RAID protection. "Think about everything you do and try to set some priorities," Casey says.

**Buyer beware**

You will also want to comparison shop, but use caution when dealing with any other than systems vendors, Porter advises. Newcomers may offer pretty packages and neatly wrapped wires, but they lack the experience to answer tough questions.

Users may even contemplate designing their own RAID configurations with the number of available inexpensive disks, but analysts warn it takes a fair investment in time to become savvy enough about disk array technology to "be able to second-guess a vendor," Casey says.

If RAID is not within your reach yet, wait. As with other kinds of disk storage, RAID's cost is dropping nearly 20% per year, Davin says. Similarly, Friedlander estimates that most low-level RAID schemes — from Level 0 to 4 — cost only about 20% more per megabyte than non-redundant drives.

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6.0

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-17.5

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5.7

Teknowledge

-17.5

Lotus Development

5.0

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-11.3

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4.8

CompuServe

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4.3

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-20.8

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3.6

Hewlett-Packard

-14.4

Interactive Data

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-4.3

Belkin Corp.

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Internet Connection

-13.3

Xybots

2.9

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-28.0

Dollar

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5.2

Sage Computer Systems

-10.6

Ballard Development

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Little Computer Corp.

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AEG

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Xybots

2.8

Computer Horizons

-4.0

Industry Volume

Jan. 27 Stock Ticker

Where are they now?

One year after initial public offerings (IPO) in the technology sector began to decline, how have these companies that succeeded in making deals in the fourth quarter of 1993 fared? How have the companies that succeeded in making deals in the fourth quarter of 1993 fared? Some, like Planar Systems, have tripled in value since their IPO.

Not so golden days

On the other hand, Golden Systems, Inc. (GLDN) in Simi Valley, Calif., a maker of power supply units, plummeted to 25 cents a share from its initial offering of $7 per share. Compaq Computer Corp. delivered the fatal blow when it rejected a contract for $5 million worth of the company's product because of a manufacturing flaw.

There's more than a glimmer of hope for Golden on the horizon, however, said Ian Gilson, an analyst at Van Kasper & Co. in San Francisco. "Golden has been sick but is very alive and in the recovery room," he said, adding that Compaq has agreed to take back the reworked product. He also said there are reportedly several agreements pending with major customers. It comes as no surprise that most of the IPOs saw little or no growth, according to Michael Keitz, vice president of Keitz Investment Management in Philadelphia. "Only about 25% to 30% of IPOs are above their initial offering price two years later," Keitz said. —Erin Callaway

IPO-lar opposites

These companies were able to capture investors' attention in 1993's fourth-quarter IPO drought; one year later, they are on opposite ends of the spectrum. 

<table>
<thead>
<tr>
<th>Company</th>
<th>IPO price</th>
<th>Today's price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Golden Systems, Inc.</td>
<td>7</td>
<td>1%</td>
</tr>
<tr>
<td>Planar Systems, Inc.</td>
<td>7</td>
<td>24%</td>
</tr>
</tbody>
</table>

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EMC works RAID into Symmetrix

CONTINUED FROM PAGE 1

praised the flexibility promised by EMC's mix-and-match RAID strategy. The Hopkinton, Mass., company may be the first mainframe disk vendor to offer that in one array, although Amdahl Corp. and Encore Computer Corp. are jointly working on a similar product, analysts said.

"Given the choice between a box that was flexible and a box that was not, I'd take the box that was flexible," said John Marshall, team leader for capacity planning and mainframe storage at General Accident Insurance of Philadelphia. "You might want to fully mirror some portions of your data, but for others, you don't need that kind of protection or the extra cost it demands, Marshall added. He now has about 500G bytes of Symmetrix capacity installed.

"You don't always need everything done the same way," agreed Bill Rasmusen, vice president of the information services department at North Pacific Insurance Co. in Portland, Ore. EMC does a good job of 'trying to build what the market says it wants, and that's pretty successful for them," he said.

An army of RAID

next Tuesday will be a busy day for mainframe RAID array watchers. Sources said Hitachi Data Systems Corp. plans to introduce a promised RAID Level 5 subsystem on Feb. 7, a date that was already penciled in for Storage Technology to unveil details on its upcoming Kodiak array.

But users should not expect to see either very soon. Analysts said both products are expected to ship in the third quarter, the same time that EMC's RAID-S implementation is supposed to hit the market. HDS would not comment, while StorageTek said only that it expects to deliver Kodiak to an initial beta site this quarter.

Kodak is expected to reach capacities of a terabyte and act as a more general-purpose alternative to StorageTek's Iceberg 9200 array, sources said. Meanwhile, HDS' product should be in the 750G-byte range, with performance similar to that of EMC's Symmetrix arrays, they added.

"Hitachi has been trying to push outdated 3380 technology against EMC for over a year, and they've clearly lost," fawning behind upset EMC in market share, said David Vellante, an analyst at International Data Corp. in Framingham, Mass. But the new product "clearly puts Hitachi right back in the ball game," he added.

When it ships, that is. George Sekely, president of the information systems unit at CSX Corp. in Richmond, Va., said HDS must also get more aggressive on pricing. "They have fabulous gear, but they just haven't been able to come with the right price for me," he said. —Craig Stedman

NT Server

CONTINUED FROM PAGE 1

cal company. "It gives me another powerful server platform option, and it means I'm no longer relegated to Intel Corp.-based processors."

Hankering for power

Bob Sakakeeny, an analyst at Aberdeen Group in Boston, agreed, noting that many of the businesses he has spoken with recently are eager to install more powerful processors. "Users who are currently running NT Server 3.5 on a Silicon Graphics, Inc. Mips [Technologies] machine or a Digital Equipment Corp. Alpha processor are drooling over the performance. NT Server is a screamer on these boxes, and users can expect the same type of performance boost with the PowerPC platform," Sakakeeny said.

"This type of power is the reason that NT Server 3.5 is winning against OS/2 as an application and database server and is starting to eat into departmental-level Unix machines as well," Sakakeeny added.

The upcoming support for the PowerPC platform now leaves Hewlett-Packard Co. with the lone high-end processor not supported by NT Server, Sakakeeny said.

Besides the new features, the NT Server 3.51 upgrade will also remove the current limitation that allows applications to cache only 256M bytes of memory per transaction, Nash said.

"It's not a huge architectural problem," Nash said. "In NT Server 3.51, Microsoft will increase the work set or currently mapped virtual address space] limit from the current 256M bytes to 2G bytes. This will allow customers to run applications utilizing the full 2G bytes of address space in the working set."

Some NT Server 3.5 users such as Jim Sinyle, systems consultant at Sun Company, Inc. in Philadelphia, said they had not come up against the 256M-byte caching limitation. "Overall, I've been very pleased with NT Server and haven't run into any performance problems or issues," Sinyle said.

Not perfect

Sinyle and Dugger did say there were a few outstanding "wish list" features they would like Microsoft to incorporate in future NT Server releases. For instance, they said they would like automatic disk quota functionality and a utility that would clean up disks in the aftermath of a virus.

"I'd love to see automatic disk quotas as a preventive measure that blocks users from storing files before, and not after, we run out of disk space. Right now, if we run out of disk space, we have to manually go back and clean things up," Sinyle said.

Sources close to Microsoft said the company has no plans to produce disk quotas and will rely on third-party support to deliver this functionality.

However, some observers expressed wariness about the potential impact on performance from EMC's plan to use RAID Level 4 technology as the underpinning of the RAID-S offering. In RAID Level 4, the parity data used to reconstruct files after a disk crash is written to a dedicated platter, whereas the more common RAID Level 5 approach spreads the parity information across all of the drives in a drawer.

RAID Level 4 "is something I would have to look at from scratch," Marshall said. "I have no experience with that at all." He added that EMC's plans to use RAID Level 4 technology in making use of the RAID-S capability would depend heavily on how it performed compared to the parity mirrored configurations of Symmetrix.

Tossing the cache around

Paul Weissblat, an analyst at Gartner Group, Inc. in Stamford, Conn., said RAID Level 4 "normally would have a worse write penalty" than RAID Level 5. However, he added that EMC hopes to alleviate that through its usual strategy of throwing large amounts of cache onto the Symmetrix arrays.

Dick Blaschke, vice president of mainframe product marketing at EMC, said there would be "no comparison" between mirrored Symmetrix performance and RAID-S throughput. But he claimed RAID-S is "not going to be any worse" than competing RAID Level 5 and above arrays such as IBM's Racmac and Storage Technology Corp.'s Iceberg 9200.

The RAID-S approach required less of an architectural change for EMC, and users will not have to rewrite data as extensively as with RAID Level 5, Blaschke said. But disks will have to be swapped out to go to RAID-S because the RAID logic will be embedded in a chip at the drive level rather than within the Symmetrix controller. That also should help minimize performance penalties, he added.

"There will be some disruption for customers, no question. But I think EMC is going to mask that disruption pretty nicely," said Carl Greiner, an analyst at Meta Group, Inc. in Stamford, Conn. He added that the mix-and-match strategy should keep Symmetrix "in the forefront" of mainframe array functionality.

RAID goes radical. See CW Guide page 77.
INDUSTRY PULSE: Object technologies

Save time and gain productivity

Users will move to object technology faster once industry standards are adopted and commercial tools and class libraries become more widely available.

Reasons to move to object technology

<table>
<thead>
<tr>
<th>Reason</th>
<th>Object-oriented applications currently in use</th>
</tr>
</thead>
<tbody>
<tr>
<td>36% Improve programmer productivity</td>
<td>52%</td>
</tr>
<tr>
<td>33% Reduce time to market</td>
<td>42%</td>
</tr>
<tr>
<td>31% Enhance software quality</td>
<td>30%</td>
</tr>
<tr>
<td>28% Increase software reuse</td>
<td>28%</td>
</tr>
<tr>
<td>24% Reduce maintenance costs</td>
<td>26%</td>
</tr>
<tr>
<td>16% Save in software costs</td>
<td>25%</td>
</tr>
<tr>
<td>13% Increase user productivity</td>
<td>18%</td>
</tr>
</tbody>
</table>

Base: 404 object technology users (multiple responses allowed)

Object-oriented programming provides higher productivity, reliability, and availability, but it faces a high learning curve.

Object technology revenue

<table>
<thead>
<tr>
<th>Year</th>
<th>Object databases</th>
<th>Analysis &amp; design tools</th>
<th>Programming tools</th>
</tr>
</thead>
<tbody>
<tr>
<td>1993</td>
<td>$76M</td>
<td>$35M</td>
<td>$319M</td>
</tr>
<tr>
<td>1994*</td>
<td>$114M</td>
<td>$63M</td>
<td>$449M</td>
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<tr>
<td>1995*</td>
<td>$296M</td>
<td>$100M</td>
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<td>$491M</td>
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<tr>
<td>1997*</td>
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<td>$1.3B</td>
</tr>
<tr>
<td>1998*</td>
<td>$1.4B</td>
<td>$290M</td>
<td>$2.2B</td>
</tr>
</tbody>
</table>

Object databases are used mainly in technical applications, but they are attracting attention in the insurance industry and IS departments.

Object databases

<table>
<thead>
<tr>
<th>Productivity improvement with Smalltalk object programming:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Original task</strong></td>
</tr>
<tr>
<td>Development time</td>
</tr>
<tr>
<td>Labor months</td>
</tr>
<tr>
<td>Lines of code</td>
</tr>
</tbody>
</table>

Base: 236 object technology users (multiple responses allowed)

Objects in action

Object-oriented programming provides higher productivity, reliability, and availability, but it faces a high learning curve.

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</tr>
<tr>
<td>(206) 641-7770</td>
<td>(206) 641-7770</td>
</tr>
</tbody>
</table>

Clueless in the parallel universe

Users might be able to take advantage of a bit of confusion surrounding IBM's new parallel, clustered CMOS hardware systems. The architecture has thrown some people for a loop when negotiating contracts for software to run on the big machines. IBM's so-called systenx design can split processing among a cluster of computers, which can make it difficult to determine how much vendors should charge for packages. The one contract negotiator at a large mainframe software vendor admitted last week, "We have no clue how to price that at all."

Sick and tired of hearing about the I-way, infobahn and National Information Infrastructure? So are members of the Boston Users Group, who took a poll and came up with what they consider a preferable alternative. Their choice: "Shirley." Go figure. In the meantime, feel free to come up with news tips or tidbits for CompuServe and then call our 24-hour voice-mail tip line at (508) 820-8555 or our toll-free number at (800) 343-6474. News Editor Maryfran Johnson can be reached by phone at (508) 820-8179, via the Internet at mjohnson@cwn.com or through MCI Mail at 596-8017.

Warped minds want to know

OS/2 has only been married to IBM's other software operations for three weeks, but already it is making them change their errant ways. Just last fall, the CICS folks at IBM promised that a Windows NT version of the transaction monitor would be introduced in early 1995 as an alternative to CICS for OS/2. The NT product does, in fact, exist, but IBM no longer plans to make a public fuss about it, CICS officials said. "You're clearly going to see IBM software operations working in a more coordinated way," said CICS strategy manager Geoff Sharman.

This Tiger ain't burnin' so bright

Microsoft finally began its long-awaited Seattle-area tests of its "Tiger" Media Server, but don't expect to be ordering pizza and Supershakes tickets over your TV any time soon. The test, which began six months late, is in only about five homes. At that rate, yours will be installed sometime in the next century. So far, for now, better let your fingers do the walking. Can you say "interactive television," children?

Pawpaw in 100VG-land

Proponents of 100VG-AnyLAN are hosting a forum today in San Francisco to drum up support for the fledgling 100M bit/sec. networking technology, which faces fierce competition from "fast" Ethernet and low-speed ATM technology. Reports that IBM's love for 100VG-AnyLAN is waning are not helping matters. Several analysts report that behind closed doors, Big Blue — one of the first companies to jump on the 100VG bandwagon — is pushing its own 25M bit/sec. ATM over 100VG-AnyLAN. IBM denies this, however.

This New Era needs some character

Informix will sue customers demand for a character-based version of its spiffy new development tool, New Era, according to a user group leader who was briefed by the company. Informix officials plan to surprise the sales staff with the news this week at an annual companywide meeting in Nashville. Sales reps "have been pretty beaten up about this issue" by users, the group leader said.

Go figure. In the meantime, feel free to come up with news tips or tidbits for Computerworld and then call our 24-hour voice-mail tip line at (508) 820-8555 or our toll-free number at (800) 343-6474. News Editor Maryfran Johnson can be reached by phone at (508) 820-8179, via the Internet at mjohnson@cwn.com or through MCI Mail at 596-8017.
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