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Scott -

Here are a few articles that provide background on the opportunities we discussed by telephone. You will see that a company called Tibco is probably Modulus' biggest software competitor in pursuing this strategy. The good news for us is that Modulus' technology is superior to Tibco's software (we routinely beat them whenever we face them at customers). The bad news is that Tibco has already gained some share of mind in the press by pushing the Internet idea. Fortunately, we also know that Tibco has not actually delivered the product that they are talking about -- this means that if we can line up supporters and deploy the Modulus software in a substantial Internet environment, we can quickly change the playing field.

The last article is about Visigenic, one of our software partners that we may pull in to this effort.

Best regards.

- Rex

FIELD REPORT

FIRST BAPIS TAKE FLIGHT

In an effort to increase the openness of its R/3 enterprise application suite, SAP America Inc., Wayne, Pa., has published specifications for its first 100 business application programming interfaces, or BAPIs, on the World Wide Web. An open standard business process interface, BAPIs lay the groundwork for transforming R/3 to the component-based Business Framework architecture, which SAP announced last August at Sapphire '96 in Philadelphia.

With the BAPIs, SAP wants to create an industry standard, says Max Bezahler, manager, product marketing for emerging technologies at SAP. Bezahler

defended SAP's decision to publish the BAPIs on the Web, which, in the short-term, will not produce any revenue for the company. However, "[In the long run] it will increase the usage of SAP. SAP will have more work generated by having an open set of standards out there."

The BAPIs, Bezahler says, will extend R/3's customer base into the mid-size market. The software is no longer "a monolithic solution. You can use the software links that you want to, you don't have to do everything SAP or forget it," he says.

However, says Henry Morris, an analyst at Framingham, Mass.-based International

Data Corp., SAP has to do more than publish the interfaces in order to penetrate the middle market. While Morris acknowledges that the BAPIs are an important step, SAP needs to tackle other issues, such as distribution and selling channels, before they can woo mid-size companies. "There's still distance between SAP and other companies in this market."

However, he agrees the BAPIs will make it easier for ISVs and customers to link applications to R/3. "They've reduced the level of effort required [by customers] to interface any custom application that they've written or any older application that they're

migrating to SAP. Customers don't have to build these interfaces themselves. [SAP] is putting less on the customer and their IT department to do," says Morris.

Like SAP, ERP competitors Baan and Peoplesoft are trying to componentize their applications. "Baan and Peoplesoft have undergone a rearchitecting of their applications in

SAP aims to woo mid-market companies

The open interfaces also ease the job of developers, who can now write in languages such as Visual Basic, rather than ABAP, SAP's proprietary language. "You've greatly reduced the skill level that you'd have to bring in-house to do that," says Morris.

which they want to provide their application on a more highly distributed model," Morris says. Adding this object layer to SAP's existing application software is an intermediate stage in becoming component-based, he says.

Julieka Dash

PUBLISH/SUBSCRIBE COMES TO THE NET

Tibco Inc., one of the first middleware providers to bring a "publish-and-subscribe" infrastructure to the financial market, recently announced new products and alliances designed to bring this same technology to the Internet. This technology, says Tibco, represents a new paradigm for the Web, which has been based on a request-respond architecture. The publish-and-subscribe model, sometimes described as push computing, has been used by the financial market for years to deliver information throughout large trading houses who depend on sub-second response time.

At the heart of Tibco's strategy are alliances with key players in the industry. Perhaps the most important from an Internet perspective is the agreement with Cisco Systems Inc., San Jose, Calif., to incorporate Tibco's technology into Cisco's Internet Operating System, found in the majority of high-end routers on the Internet. Says Cisco CTO Edward Koziel, "We are

often asked if the Internet can continue to scale up. Our answer is that the history of the Internet is one of constant growth and constant innovation to compensate for that growth. Only through this and driving open standards in the market do we think we can provide better functionality."

Tibco and Cisco will work together to develop an open reference specification for publish-and-subscribe technology. Cisco plans to offer the spec as an option on its routers sometime in mid-1997.

Vivek Ranadive, Tibco CEO, says that the biggest problem facing the Internet is congestion. With the request-respond model primarily used on the Web, a response must be sent each time a person makes a request for a particular piece of information. With Tibco's infrastructure, information is broadcast out by publishers. A single copy is sent to each router in the network. The Tibco software running on each router splits the message into the minimum number of copies required to

reach everyone who has subscribed to a particular subject. Consequently the publishing server is not overloaded with requests from different people asking for the same information.

To fortify its architecture, Tibco plans to roll out a variety of products during the first half of 1997. One of the most important is the Subject Naming Server, which will allow people to find new publications much in the way that domain name servers are used to resolve Web addresses.

Other products include the TIBnet SDK, which will enable developers to create their own applications; the TIBnet Proxy, which will provide security and subject name filtering for a network; the TIBnet engine, which will contain runtime packages for application deployment; and the TIBnet ISP Kit, a set of software components that will enable Internet Service Providers to support publish and subscribe over their networks.

George Lawton

NEWS

TRAILBLAZER • BANK OF BOSTON

IP multicasting opens up intranet

By Mark Leon

EVEN AS INDUSTRY pundits predict the collapse of the Internet, some companies are quietly deploying technology that could help make it safe for mission-critical applications.

New software built on the Internet Engineering Task Force's IP multicast suite of protocols makes it possible for the Bank of Boston to serve up real-time financial information to its traders over a corporate intranet.

Trying to route data using standard point-to-point IP technology, the bank hit a performance wall at only five users.

To topple that wall, the company has been using since May the Tibco Trading System from Tibco, a subsidiary of Reuters, to serve more than 200 traders who need instantaneous information.

"If I'm a foreign-exchange trader, for example, a small movement in

currency price can quickly affect a lot of people," said Stephen Scullen, director of global capital market systems at the Bank of Boston.

This is where IP multicasting's bandwidth-saving feature is critical. Information from the bank's central feed is sent out only once from the server. Tibco's software uses the multicasting protocol to tag IP packets at the server, and Tibco's MarketSheet client software picks out just the information the trader wants to see and displays it on the desktop.

"This selection of data takes place at the network interface card level, so it also saves CPU cycles," Scullen said.

The alternatives would be to customize data according to individual trader preferences at the server or put the information in application software at the client. The former method would clog the network

because the same packet might be sent many times, and the latter would burn up CPU cycles.

Neither alternative is attractive to managers of resource-hungry corporate intranets, which is why vendors are rallying around the multicasting standard. Cisco Systems is making its routers and switches multicast-aware; JavaSoft is including multicasting in the Java messaging standards; and Netcom will be one of the first Internet service providers to support multicasting.

And last week Tibco announced an Internet version of its multicasting software called Tibnet, which will ship next year.

Analysts said the announcement was well timed.

"This is a compelling Internet multicast application because of the few-to-many problem it is addressing," said Ed Acl, director of middleware research at International Data, in Framingham, Mass. "Tibco's announcement addresses a pending need."

Companies such as the Bank of Boston agree.

"We are very interested in the Internet announcement from Tibco," Scullen said. "We would like to

IP multicasting
The Bank of Boston uses Tibco software to multicast customized financial information to traders over its intranet.



SOURCE: TIBCO INC.

be able to display the same information our traders can see here [on the Bank of Boston's intranet] to our clients over the Web through a Netscape browser. This would entail putting Tibco's application out on the net and something like their MarketSheet in the browser. The payoff is the same — a more efficient use of the network."

Case Study Toolkit

It's like we mixed some

INTERNET WORLD '96

Microsoft, PointCast team to 'push' Web information to users

By Mitch Wagner

MICROSOFT CORP. AND PointCast, Inc. announced last week that software

for receiving PointCast news broadcasts over the Internet will be included in Windows 95 and Windows NT by next July.

At Internet World '96 in New York, the two companies said PointCast's client software will be part of Active Desktop, next year's version of Microsoft's Inter-

net Explorer browser. Unlike previous versions of Explorer, Active Desktop will be able to run as the Windows desktop, replacing the usual interface in Windows 95 and Windows NT.

The agreement adds momentum to a medium that was already becoming popular over the Internet: "push-oriented" or "broadcast" technology.

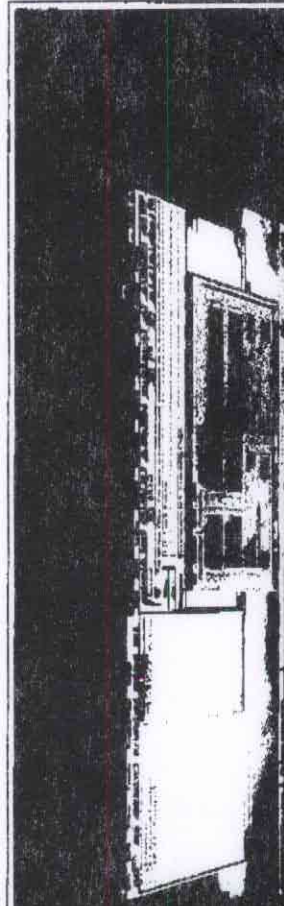
The idea is simple but powerful: Instead of waiting for users to go to World Wide Web pages on the Internet or an intranet, information systems managers can build pages that push the information from servers to users' desktops.

"It's like a form of multimedia E-mail," said Larry Lozon, senior vice president and director of General Motors Corp.'s Cyberworks business unit in Detroit, which is exploring Internet-based marketing and advertising. "It's immediate. Until now, you had to wait for a user to go back to a Web site for new information. This allows you to send directly to him."

Cyberworks has been testing a push-oriented tool kit from BackWeb Technologies in San Jose, Calif., since September. The Microsoft/PointCast alliance follows a deal from Netscape Communications Corp. last month to incorporate Castanet push-oriented software from



GM's Larry Lozon: Push technology "is like a form of multimedia E-mail"



GROUP THERAPY

for Windows NT.

Castanel push-oriented software from Marinba, Inc. into its upcoming desktop software, Constellation. Marinba is a company in Palo Alto, Calif., that was founded by the inventors of Java.

WHAT'S IN STORE

Right now, the main application for push technology is delivering news and advertising via the Internet. Developers also talk about building intranet applications to push corporate information down to users' desktops.

But those applications are just a sliver of the functionality possible with push-oriented technology, according to Forrester Research, Inc. a consultancy in Cambridge, Mass.

In the long term, the technology can be used to push programs as well as text, images and animation down to users' desktops, said Forrester analyst John Robb. It is a way to achieve true client/server computing on the desktop, allowing IS managers and software companies to develop applications that distribute themselves so that some processing occurs on the server and some on the client, he said.

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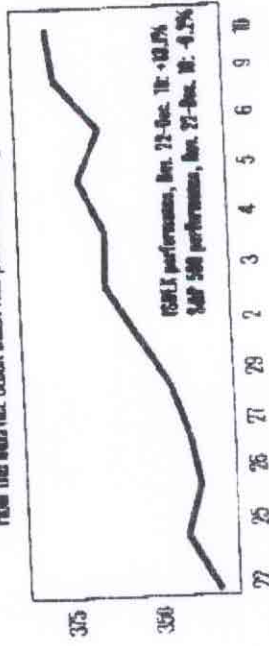
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U P T I C K

Pure-Play Internet Companies

How the Internet Stock Index has performed lately.



ISDJI performance, Dec. 22-Dec. 11: +13.1%
 IAP 500 performance, Dec. 22-Dec. 11: -4.2%

...and a look at its individual components

Name	Dec. 22 Close	Current Close	Change from Dec. 22 (as % since IPO)
Account	\$0.75	+0.9%	-63%
CheckPoint	\$19.08	-9.7%	-62% (June 28 IPO)
CMG	\$10.13	+22.4%	-58%
clinet	\$22.75	+33.8%	-62% (July 2 IPO)
CyberCash	\$20.25	-3.7%	-54% (Feb. 15 IPO)
Excite	\$14.00	+128.6%	-18% (Apr. 4 IPO)
FrontFront	\$7.63	+62.5%	-14%
FTP Software	\$0.00	+14.3%	-72%
GlobalSoft	\$4.50	+41.2%	-74%
Individual	\$5.25	-4.5%	-63% (Mar. 15 IPO)
Infoseek	\$8.94	+11.7%	-26% (June 11 IPO)
Lycos	\$14.50	+38.5%	-9% (Apr. 2 IPO)
MediaWorld	\$10.75	-10.7%	+17%
Midwestnet	\$7.44	+24.0%	-7% (Mar. 13 IPO)
Netcom	\$11.25	+13.1%	-52%
NetNinja	\$7.25	+20.8%	-68%
NetScape	\$43.00	+15.9%	-9%
Open Market	\$15.00	-5.5%	-17% (May 23 IPO)
Open Text	\$8.00	+33.8%	-56% (Jan. 24 IPO)
PSinet	\$12.00	-11.7%	-48%
Quarterdeck	\$5.31	+8.3%	-61%
Raptor	\$22.00	+6.4%	+53% (Feb. 7 IPO)
Spyglass	\$10.36	+58.0%	-11%
Vocaltec	\$5.83	-2.9%	-70% (Feb. 7 IPO)
Yahoo	\$20.25	+14.9%	+56% (Apr. 12 IPO)

Microsoft and OMG standards. The sort of conflict that has developed between Netscape and Microsoft "will always be a problem for us," Visigenic chairman and CEO Roger Sippl said. "Whether it's Microsoft and Netscape or Oracle and Microsoft, we will tend to wind up in the middle of it—but that's kind of our role. We will always be the Switzerland, if you will. So this will always be a source for confusion, and for headlines that sound exciting but don't mean much."

Sippl defines this company. In 1980, when he was 24 years old, he founded Informix Software, which over the next decade grew into a major relational database vendor, worth more than \$100 million.

During that period, he chaired the SQL Access Group, which was trying to establish a standard application programming interface (API) for relational databases. At the time, the Structured Query Language (SQL) standard was supported by every major database vendor, but there was no standard way of transmitting an SQL statement from a client to a database server.

In theory, anyone could have implemented the specification the SQL Access Group produced. In practice, Microsoft was the only one to turn it into a successful product—ODBC.

Meanwhile, Sippl had left Informix in 1990 and started a career as a venture capitalist. In 1993 he started Visigenic, which was originally supposed to make client-server development tools. To make its tools successful, Visigenic wanted to make use of the standard SQL interface Sippl had worked on. Microsoft's ODBC was just starting to gain popularity, and Sippl struck a deal to port that

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CEO Roger Sippl, founder of Informix in 1980, now in many ways defines Visigenic.

tivity (ODBC) standard on platforms other than Windows. Visigenic is also developing products for OLE DB, which Microsoft sees as the successor to ODBC and the key to making ActiveX and DCOM, the Distributed Component Object Model, the focus

of future Web applications. The aim for Netscape, Microsoft, and many other players is to allow applications—both on the Web and in other environments—to be built from reusable components known as objects. Such applications are easier to construct and maintain. With DCOM and CORBA, these objects no longer have to reside on the same machine or be written in the same language—they can com-



By David F. Carr
IN THE BATTLE that Netscape and Microsoft are fighting over distributed object standards for the Web, Visigenic Software Inc. has a foot firmly in each camp. Recently, Visigenic has been in the news for working with Netscape to promote the use of CORBA—the Object Management Group's Common Object Request Broker Architecture—as a new standard for the

A Nimble Company Straddling Worlds of CORBA and COM

Web. As an industry consortium devoted to platform-independent object standards, the OMG is competing with the de facto standards that Microsoft has been developing as part of Windows. But despite its current emphasis on CORBA, the six-year-old San Mateo, Calif., company was built on a similar standards-setting relationship with Microsoft, pioneering the use of the Open Database Connect-

municate in a language-independent way across the Internet or other networks. Visigenic continues to bet on Microsoft's technologies for access to data, but it sees CORBA as the more powerful technology for providing access to objects. Visigenic is not just a double-agent in this war, however; it's also trying to serve as a mediator with products to translate between Mi-

PHOTO: BRISTOL FACTORY

Visigenic

From page 03

technology to database server platform—mounting mostly Unix. In making that deal, Sippl was either very lucky or very visionary, said Gartner Group analyst Yefim Nalis. "ODBC has become a very big product, and that was probably not as obvious when the deal was struck," he noted.

Today, Visigenic remains the dominant supplier of ODBC technology for Unix, although competitors such as Inetsoft have gained a larger share of the overall market. Inetsoft dominates on Windows.

MAINTAINING THE LEAD

Visigenic hasn't stood still, however. Over the past year, it has been repositioning itself as a middleware company, rather than just a supplier of ODBC drivers.

And it entered the distributed object systems market in May when it acquired PostModern Computing, a vendor of CORBA-compliant Object Request Brokers (ORBs).

In early 1986, PostModern was a seven-person company without a famous founder or a lot of investment capital. It was one of the smallest CORBA vendors, but was known for having some innovative technology.

Most significantly, in terms of the Web, PostModern had made an early commitment in the Internet Inter-ORB Protocol (IOP) introduced in CORBA 2.0.

While most ORB had vendors elected to legitimate IOP as an alternative to their proprietary protocols, PostModern decided to use IOP exclusively. It then combined IOP with a Java version of its ORB to produce a product called Black Widow.

With Black Widow, you could download a Java applet that would turn your browser into a CORBA client capable of communicating with the Java-based Black Widow server as well as with PostModern's C++ ORB or any other CORBA server that supported IOP.

Suddenly PostModern was very popular, with suitors that included Visigenic, Netscape, and several of the major database vendors, all of whom saw the Black Widow technology as a powerful tool for building sophisticated Web applications.

PostModern co-founder Jens Christensen said the company's principals also realized they had an opportunity that might slip past if they continued to pursue it as a small, independent company. On the other hand, they worried that they might get lost within a much larger public company. Visigenic presented an attractive alternative, as a small but growing company that was just preparing to go public. PostModern's principals received one-third of the equity in Visigenic as part of the acquisition. Visigenic went public in August.

The other interesting part of the transaction was that Netscape, Glass Systems, and Sterling Software agreed to invest up to \$5 million in Visigenic to help close the deal.

The other shoe dropped in late July, when Netscape announced it would build Visigenic's CORBA technology into future versions of its client and server products.

Christensen, who now serves as Visigenic's chief technology officer, said the ORBs—now known as VisiBroker for C++ and VisiBroker for Java—represented a natural fit with Visigenic's database access products.

"We think that, just like you store data in databases, you're going to store business

logic in objects," he said. Although the database market is beginning to move toward object databases and object-relational hybrids, most business data will continue to be stored in relational databases, he said. So ODBC will continue to be important.

Visigenic was also able to demonstrate an immediate benefit, using some of the Java ORB technology in its new VisiChannel for JDBC product. JDBC is the Java equivalent of ODBC, and the product performs the translations needed to access ODBC databases.

Although Visigenic is promoting a CORBA strategy, Sippl said he is not counting out Microsoft's object model. "I think at least two object models will become successful: CORBA and COM. And there are more object models than that in the world. But the users don't care about object wars—they just want everything to work."

To that end, Visigenic has announced a VisiBroker for ActiveX Bridge that allows COM objects on the client to work with CORBA objects on the server.

So far, Visigenic says it has been able to work both sides of the fence without much friction.

Microsoft data access product manager Greg Nelson said he sees the same strategy with a lot of companies. "They keep a foot in both camps, and try to make sure one of them works out for them. There's nothing wrong with a strategy like that. We continue to work with Visigenic no differently than we did before."

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