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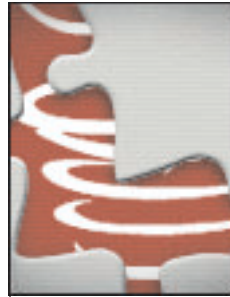
# JAVA JIGSAW

Sun faces daunting odds in new effort to solve profit puzzle

**By all accounts, Java has revolutionized the software business in the seven years since Sun Microsystems invented the programming language.**

While Java has solved countless problems for programmers, however, it has presented Sun with a puzzle that continues to confound the company today: how to make profits from the software that reflect its wide popularity.

As Sun presides over this week's annual JavaOne conference—traditionally a showcase for cutting-edge technologies and a rallying point for Microsoft bashers—the company will be maneuvering against others within the Java camp to take market share that it sees as its rightful bounty. But its rivals, which have capitalized on Java more than Sun in many ways, will not give up this lucrative ground without a fight.



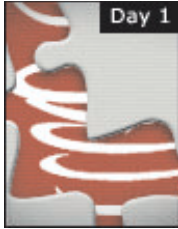
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The company must overcome its long subordination of Java as a stepchild to its hardware business, which has allowed rivals to profit more from direct sales of the software.
  
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The emerging market could give the company a chance to regain a leadership role in the software industry, but others say Sun's efforts may be too little and too late.

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## JAVA JIGSAW

# The goal: Sun looks for payoff to Java addiction

BY STEPHEN SHANKLAND  
March 25, 2002

As Sun Microsystems' chief claim to fame in the software world, Java began seven years ago as a bold assault on the company's sworn enemy, Microsoft.

**F**ew deny that the programming language has been a major achievement for the company, which had previously been known mostly for its workstation and server hardware. Java has provided an entrée to prime accounts, subverted power from Microsoft, drawn loyal hordes of programmers, and won Sun the respect accorded a company with the ability to reshape the industry.

There's just one problem: For all its hype and popularity, Java has made more money in direct software sales for competitors than for the company that invented it. Sun, for example, is a distant third in the most profitable market for Java software, application servers. And the company gives away for free its Java Software Development Kit, easily the most popular tool among Java developers.

Mike Gilpin, an analyst with Giga Information Group, likens Sun's missed opportunity to the Spanish exploring the Western Hemisphere but losing ultimate control. "It doesn't matter that you were the first Spanish explorer to get there. Your name is stuck on the road sign, but people forget who you were," he said.

Today, as Sun enters its 20th year, the Silicon Valley stalwart is trying to redefine Java's place in high-tech history—and finally make its prized technology pay off in a major way. In addition to restoring corporate pride, Sun is seeking to reclaim Java from a financial perspective to counter the devastating effects of the recession and dot-com meltdown.

Sun led the server market at the height of the Internet boom but has since lost ground to IBM and other rivals. Plummeting revenue has forced Sun to lay off staff and take other serious measures to cut costs.

The company is now trying to sell more software, as well as services and storage products, to offset its plunging server sales. That task, however, is complicated by Sun's long subordination of Java as an indirect way to make money while others profited from Java server software.

"There is more Java outside of Sun than inside—more revenue, more product, everything," said Steve Mills, the head of IBM's software unit. "Sun is the steward but not the

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prime beneficiary or the prime contributor to the sum total of all that is Java.”

To reverse its fortunes, Sun needs to overcome long-standing problems with its Java strategy. Some view the early handling of Java as a serious strategic misstep that continues to hamper Sun today because its rivals have consistently built on their initial advantage, leaving the company to play catch-up whenever a new software market comes of age.

This is the paradox of Java: The very openness that made the technology popular also made it possible for competitors to profit from Java at Sun’s expense.

Gartner analyst David Smith describes it as something of a catch-22 that eventually worked against the company. “If Sun didn’t have all these companies sharing the wealth of Java, Java wouldn’t have been successful,” he said.

Key to Sun’s renewed plans is a focus on Java’s potential in Web services, a growing trend to provide information and software on any device with computer transactions scattered across different companies’ servers on the Internet. All major software makers are targeting new products at Web services.

This campaign, like so many others put forth by Sun over the years, is already

on a collision course with perennial rivals Microsoft and IBM, as well as other formidable competitors. But the company is determined to wage battle on multiple fronts ranging from the industry to the courts, where it has filed an antitrust lawsuit that seeks to thwart Microsoft’s .Net services initiative.

“We revamp plans to make sure we’re winners,” said Pat Sueltz, formerly of IBM and now executive vice president of Sun’s software systems group, speaking of Sun’s Java server product. Sun will showcase its latest efforts in Web services this week at its annual JavaOne conference.

For years, Sun has refused to quantify the financial value of Java, but some details illuminate just how important it is to the company’s server hardware, the powerful networked machines that handle chores such as stock trades or online catalog sales. “Java is a key factor in 90 percent of sales,” Sueltz said, estimating that 98 percent of Sun servers used by customers run Java software.

Case in point, Ford Financial—Ford Motor’s financial services arm, which reported \$1.5 billion in revenue in 2000—wanted to replace its older servers with new models running Java. The software was Sun’s foot in the door, leading Ford to buy the server hardware to run it.

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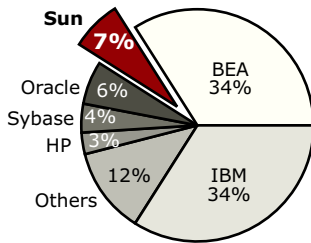
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## Slim on server software

Sun had only a 7 percent share of the 2001 market for application server software, a key use of Java.



Source: Giga Information Group

Sun also licenses Java to IBM, BEA Systems, Oracle, Hewlett-Packard and other computer companies that sell software for writing and running Java programs. Although Sun plays down the importance of revenue from such licenses, its help is undeniable.

IDC analyst Rikki Kirzner ranks Sun as second place after IBM in market share for licensing and maintenance fees for high-level programming languages such as Java. In 2000, the last year for which Kirzner has estimates, that revenue was \$22 million for Sun.

But there's a far more direct way to profit from Java—application servers, an area where Sun has been largely a flop.

An "app server" is a software package that runs on a server connected both to a company's back-end database and to the Web servers that deliver pages that can be read through browsers. British Airways uses BEA's app server software for online ticket sales, while Pentax uses the same package to create online catalog pages that can perform operations such as custom product comparisons.

### Small piece of a large pie

App servers are also the way to run Java programs on server hardware, using a Java specification called Java 2

**"Java is a key factor in 90 percent of sales."**

—Pat Sultz, executive vice president, Sun's software systems group

Enterprise Edition, or J2EE, and J2EE's component software model called Enterprise JavaBeans. IBM, Oracle, HP, BEA and Sun itself have written their application server software to conform to J2EE. Yet Sun's app server sales were only 7 percent, or about \$153 million, of the market, which Giga Information Group estimates had total sales of \$2.19 billion in 2001.

Sun's iPlanet Application Server held a very distant third place to leaders BEA's WebLogic and IBM's WebSphere, which were head-to-head with 34 percent market share each. In general, Giga's Gilpin said, BEA, IBM and Oracle have been better able to profit directly from Java because they had existing software businesses.

"Sun has been successful in shifting the agenda to Java, but in many cases others are capitalizing on it, particularly IBM," Illuminata analyst James Governor said.

Sun's Sultz isn't happy with iPlanet's weak market share and vows to fix it one way or the other. "I'm never satisfied with being at 10 percent. I want to be No. 1 or No. 2," she said.

Besides its app server, Sun's iPlanet software package includes programs for serving up Web pages, housing custom portal sites, and managing directories

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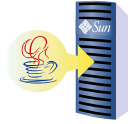
**Bringing in the money** Sun tries to make money from Java in various ways. Here's one example.



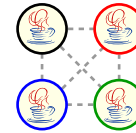
1. A customer needs to upgrade its server, so the CIO considers the software and hardware options.



2. A salesperson says Java will tie in with gadgets and future software technologies such as Web services. The CIO buys Java.



3. A Sun salesperson says Java works best on Sun servers.



4. The salesperson points out that the CIO can switch to another company's servers in the future, and the Java applications will still work. The CIO buys Sun servers.

of information such as usernames and passwords. While the directory software has thrived, iPlanet overall has been a disappointment since its inception in 1999—the merger of server software from Sun and Netscape after the latter was bought by America Online.

As Forrester Research analyst Joshua Walker said, “iPlanet has almost disappeared from the radar screen.”

Part of its problem has been the difficulty of combining so many app server technologies into a single product: Netscape acquired Kiva and its software in 1997, and Sun bought NetDynamics in 1998. “Frankly, that lost them some time,” Suelzt said.

Mark Tolliver, general manager of iPlanet's e-commerce programs, said Sun and AOL together got “way over a billion dollars' worth of software revenue during the time we were together,” but he refused to disclose how the companies split those sales.

Even if Sun succeeds in revamping iPlanet marketing, it faces a rapidly changing application server market. Java, as a programming language and software architecture, may have fared better in the marketplace than iPlanet, but it too has had its trials.

**Foiled again by Windows**

Sun's 1996 victory in getting Microsoft to license the software quickly turned sour when Microsoft modified Java to work differently on Windows. The move undermined Java's universality and led to a 1997 lawsuit that took four years to settle.

Along the way, Sun tried to secure Java's future by making it an industry standard administered by a neutral standards body. But Sun never was willing to release enough control of Java to others and eventually abandoned the plan. Now, Sun serves as Java standard bearer, in conjunction with Java licensees.

Microsoft, which now has put its weight behind its quasi-clone of Java called C# (pronounced “C-sharp”), hints that a more cooperative solution might have been reached if Sun hadn't been so “paranoid.”

“Sun had a huge opportunity and squandered it,” said John Montgomery, Microsoft's lead product manager for the .Net developer platform. Making Java a standard “would have been the right thing to help Java move forward in a way more open and amenable to both cooperation and competition.”

Perhaps, but outside observers are skeptical that any alliance could have been forged between such bitter foes as

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**“There is more Java outside of Sun than inside...Sun is the steward but not the prime beneficiary or the prime contributor to the sum total of all that is Java.”**

-Steve Mills, head of IBM's software unit

these two companies. From Microsoft's perspective, Gartner's Smith said, "anytime someone picked Java, it was a loss to Microsoft. And they acted accordingly."

Microsoft was especially threatened by the openness of Java, which lets programs run on a variety of computers without having to be changed for each one. Under Sun's concept, the exact same Java program could run, for instance, on an IBM mainframe, a Sun Unix server, or a Dell Windows server.

That convenience, touted in the much-ballyhooed slogan "write once, run anywhere," in theory could break the long domination of the Windows operating system if enough programmers adopted Java. But the programming language fell short of its promised universality, and Sun's version of Java for desktop computers never came close to replacing Windows as the software of choice.

#### **The empire strikes back**

Later versions of Java for servers and gadgets such as cell phones have been more successful than the desktop version that competes most directly against Microsoft's stronghold. Just as Sun thought it had secured Java's future, though, Microsoft has turned the tables once again, this time with the help of IBM in Web services.

Microsoft, which has led much of the progress in this burgeoning field with its .Net initiative, is attempting to relegate Java to a subordinate role in much the same way that Java tried to demote Windows to an interchangeable cog years ago. That has left Sun scrambling to retrofit its software to accommodate the emerging market.

Where Java standardizes the environment in which server software runs, Web services accommodate much greater variety. The idea focuses on standardizing the way servers find each other, communicate and describe what they can do.

"Web services is not a function of Java," Illuminata's Governor said. "It is the way to span Java and the Microsoft environment."

Undeterred, Sun is fighting hard to influence the Web services agenda instead of just follow it, focusing on some key aspects of the technology's infrastructure.

Tolliver said his iPlanet e-commerce products will serve as "the delivery vehicle" for Web services. And Anil Gadre, general manager of the Solaris operating system at the heart of Sun's software work, says his top priority is to make sure "Solaris is going to be the best infrastructure on top of which those services can be deployed."

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—James Governor, analyst, Illuminata

Outside the company, Sun spawned the Liberty Alliance Project to govern network identity and is seeking to make it a Web services standard. In addition, it wants to join the new Web Services Interoperability Group (WS-I).

#### **Sun's hardware legacy**

In many ways, however, the company's most difficult obstacles may come from within Sun itself. Industry veterans say Sun's roots as a hardware manufacturer have presented a psychological barrier to its identity as a software company.

Sun became a success by selling computer hardware. It started with Unix workstations used by programmers and researchers but blossomed into a much larger company when it converted those products into servers.

Asked during a recent interview if Sun is becoming more of a software company, Sun Chief Executive Scott McNealy refused to separate the software business from the rest of Sun's products.

“We will continue to be the systems company we have always been,” he said, arguing that in most of the computing world hardware and software are closely married. “You don't buy your cell phone hardware from one company, the software from another. You don't buy your set-top box hardware from one company, your

software from another.”

With those kind of public statements, others say, Sun may have a tough time convincing people that it's serious about software. “From the top, meaning McNealy, they don't have a big belief in software as a separate market,” Gartner's Smith said.

Still, no matter what the outcome of Java's future market, its stature as a defining technology will remain undisputed.

“Before Java, Sun was not one of the few pre-eminent companies,” Smith said. “It was their ticket from being a workstation company to being one of the big powerhouses of the industry.” ■

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## Java in time

September 1991-July 1998

- 1991** **September**  
Sun launches its Solaris version of the Unix operating system, which ultimately will replace the earlier SunOS.
- 1995** **May**  
Sun publicly launches Java software. Its primary appeal is a way to bring animation to otherwise drab Web pages.
- 1996** **January**  
Sun releases the first Java Development Kit, the initial step to ease the creation of Java programs.
- March**  
Microsoft agrees to license Java.
- May**  
Sun holds the first JavaOne conference for Java developers.
- December**  
Sun, Netscape and IBM begin a 40-city tour to evangelize Java.
- 1997** **April**  
At the second JavaOne conference, Sun proclaims that Java will extend beyond the desktop computer to the realm of gadgets and chip-enabled smart cards. Sun announces Enterprise JavaBeans, an early step to making Java useful on servers as well as in Web browsers.
- October**  
Sun sues Microsoft over its treatment of Java, arguing that Microsoft tried to add Windows-specific extensions to Java that undermine the software's key promise of universality. Sun seeks \$35 million in damages. Microsoft countersues.
- 1998** **January**  
Two million copies of Java Development Kit 1.1 have been downloaded.
- March**  
Sun announces PersonalJava for Windows CE, an attempt to outflank with Java Microsoft's push into handheld computers.
- July**  
Sun acquires NetDynamics, which sells Java server software called an application server.

September 1998-December 1999

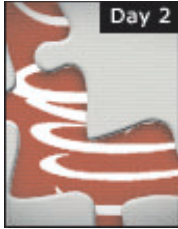
- 1998** **September**  
BEA Systems pays \$192 million for application server maker WebLogic. BEA now is No. 1 in the market, well ahead of No. 3 Sun, but more than half of BEA's WebLogic customers run the software on Sun servers.
- November**  
America Online agrees to acquire Netscape for \$4.2 billion, and as part of the deal, Sun gets the right to sell Netscape's server software.
- December**  
Sun announces Java 2, with three different versions: Standard Edition (J2SE) for desktop and laptop computers, Enterprise Edition (J2EE) for big servers, and Micro Edition (J2ME) for small gadgets. Though Java began with desktop systems, Sun has had its best success with the server and gadget versions, where Microsoft isn't as strong.
- Sun loosens licensing restrictions on Java in an effort to tap into the enthusiasm of the open-source movement. Also, Sun invents the Java Community Process to give business partners more control over Java.
- 1999** **January**  
Sun uncorks Jini, software the company bills as a way to let gadgets spontaneously join together in networks and share services. Sun quickly backpedals from the gadget promise, saying Jini works better to harness software services.
- March**  
Sun and AOL detail the Sun-Netscape Alliance, a three-year deal under which Sun gradually assumes control over the Netscape server software. The products eventually are marketed under the iPlanet name.
- June**  
Sun unveils JavaServer Pages, software for creating Web pages on the fly. It competes with Microsoft's Active Server Pages.
- December**  
The first version of J2EE ships, as well as J2SE for Linux.
- Sun reverses plans to make Java an independent industry standard.

April 2000-March 2002

- 2000** **April**  
Sun agrees to revamp the Java Community Process to give partners more control.
- 2001** **January**  
Sun and Microsoft agree to settle their Java lawsuits, with Microsoft paying Sun \$20 million and getting permission to ship an older version of Java with its existing products.
- April**  
Sun releases Jxta, an effort to try to shape the agenda of peer-to-peer computing.
- July**  
Starting with its new Windows XP operating system, Microsoft decides to stop shipping Java.
- September**  
Sun announces the Liberty Alliance Project to compete against Microsoft's Passport sign-on service. Sun eventually signs up prestigious customers including Fidelity Investments, United Airlines, AOL Time Warner, American Express and Vodafone.
- November**  
The Justice Department, nine states and Microsoft agree to settle their antitrust suit, sparking accusations from Sun and others that Microsoft got off too lightly.
- 2002** **February**  
Sun Chief Executive Scott McNealy puts on a penguin suit, dressing like the Linux mascot to prove the company has a deep, new commitment to Linux. It's the first major departure from the company's position that Linux is chiefly useful as a wrench in Microsoft's works and as an upgrade path to Solaris.
- March**  
Sun again sues Microsoft over Java, piggybacking on the Justice Department's finding that Microsoft violated antitrust law. Sun's suit is much broader than other antitrust cases against Microsoft or than Sun's earlier suit against Microsoft. ■

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## JAVA JIGSAW

# The problem: Industry bickering could limit growth

BY WYLIE WONG  
March 26, 2002

Java is drawing a rising number of businesses and software developers but still must overcome major obstacles before its long-term success is assured—including roadblocks from the very people who support the programming language.

**A**lthough recent studies show that Microsoft technologies are still the main languages used by software developers, Java is beginning to close the gap. According to a 2000 IDC study, 3 million people use C and C++ as their chief software language, followed by 2.3 million Visual Basic developers and 1.2 million Java programmers. And market research firm Evans Data has reported that more people are using Java while the number of C and C++ developers is declining.

That trend is reflected in academia as well. At the Massachusetts Institute of Technology, the computer science department in 1997 replaced Microsoft's C++ with Java as the primary software language that students are required to learn. This spring, the University of California at Berkeley offered 25 Java courses and only seven on Microsoft languages.

"In my mind, Java is rapidly going to displace all the languages, particularly C++," MIT associate professor Daniel Jackson said, noting that undergraduate students are increasingly teaching themselves some Java

even before attending his classes. In two years, the College Board will switch from C++ to Java for the computer science advanced placement tests that high school students take to get credit for college-level courses.

But even in the face of such encouraging signs, analysts and software executives say several factors could stunt Java's growth. The first is a predictable one, in the form of inevitable competition from Microsoft, which has released a Java-like software called C# (pronounced "C-sharp") and a new Internet software strategy in part modeled on Java.

The second obstacle comes from within Java's own ranks, as software companies release products that do not comply with industry-sanctioned standards. Although many of the incompatibilities are eventually worked out, Java supporters fear that this kind of independent development may create confusion and potential conflict that can splinter the technology's developers.

Finally, the complexity of Java itself continues

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to be a problem. To go beyond highly technical programmers and reach mainstream developers, analysts say Java software makers have to follow Microsoft's lead in easy-to-use programming tools that allow people to build programs simply by pointing and clicking. In particular, they criticize a standard technology called Enterprise Java Beans, which is actually supposed to save time by allowing small pieces of software to be reused. Easier Java tools would help increase the number of software developers using the language, resulting in a bigger and healthier Java market.

"It's all related in the courting of developers and independent software vendors," said analyst Mike Gilpin of Giga Information Group.

Since its invention by Sun Microsystems seven years ago, software programmers have embraced Java, first as a way to liven up Web sites and then as a way to power corporate Internet and e-business operations. Today, Java is thriving in new markets such as cell phones, providing games, stock quotes, restaurant locations and other information in real time.

The Java camp has been able to make the technology as widespread as possible, even though it failed miserably with its initial goal to supplant Windows on PCs. Part of its success is attributable to developers and customers who are

simply seeking an alternative to Microsoft, which wants Windows to run software on everything from handheld devices to corporate servers.

In playing to those looking for a non-Windows option, Sun vowed that Java would run on any device without having to be rewritten—the much-touted "write once, run anywhere" principle—as opposed to Microsoft's strategy of steering everything to run on its operating systems. Java quickly won the support of other Microsoft rivals such as IBM, Oracle and BEA Systems.

In truth, however, the programming language has not fully delivered on its promise to run on multiple devices with the same code. As a result, businesses face the prospect of spending more time and money than originally anticipated when they choose Java.

"'Write once, run anywhere,' on the server side is simply not happening," Meta Group analyst Will Zachmann said.

Many say the problem stems from the protracted time it takes to agree on a Java standard, which can take 12 to 18 months to complete. Software makers, facing intense competitive pressure for new customers, can't wait that long to release new products, so they regularly release Java software with improvements that are based on

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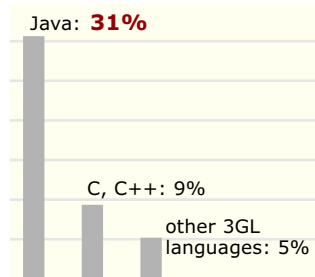
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## Crossing over

An overwhelming number of developers who are evaluating changing their primary programming language chose Java as the language they're looking at.



Every other language named counted for less than 5 percent of the total.

Source: IDC worldwide 2000 survey

nonstandard technologies.

Most Java software makers submit their cutting-edge technology to the Java Community Process, where Sun and other Java companies hash out future standards. If the technology is approved as a standard, it is made available for other software makers to use. But as new standards are created, Java companies invent new technology that is not standard to give them a competitive edge.

In their quest to differentiate themselves in the lucrative e-business software market, BEA, IBM and other Java software manufacturers have built such nonstandard technology into their application servers and other products to make them faster and more reliable. That has raised concern among some executives that a piece of software written to run on one Java maker's application server won't be 100 percent compatible if run on others.

"It's a great concern. What I believe is that it splinters Java and confuses the Java developer, where it no longer delivers on the philosophical promises of 'write once, run anywhere,'" said Simon Pepper, a product director for Iona Technologies. "It dilutes the 'compatible logo' brand. It opens the door for Microsoft. If there's a technology split and the vendors are actively split among themselves, it puts

**"In my mind, Java is rapidly going to displace all the languages, particularly C++."**

-Daniel Jackson, associate professor, MIT

doubt on developers' minds that Java is a good technology."

As an example, critics point to a controversy that has been raised in recent months by BEA, the market leader in application servers, with its plans to release a tool that allows developers to build Java applications simply by pointing and clicking.

The tool—called WebLogic Workshop and code-named Cajun—includes new grammar for the Java language that BEA plans to submit to the standards body. But some competitors say the tool is an attempt to force customers to use the company's application server.

BEA Chief Technology Officer Scott Dietzen defends the software, saying it is an "add-on" technology that was not designed to be part of the Java standard. Dietzen acknowledges that WebLogic Workshop produces software code that needs some translation to work on other application servers but said that's not his company's problem.

"BEA is not going to go out of our way to make that easy. That's not our job," he said. "Our job is to share (innovations) with the Java community. Our competitors should leverage the innovations we're sharing to bring into their own products."

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**“Write once, run anywhere,  
on the server side is simply not happening.”**

-Will Zachmann, analyst, Meta Group

Ted Shelton, the chief strategy officer of rival Borland, said he fears that such attitudes will fragment the Java camp and stunt its growth.

“Customers need to decide, ‘Do I need Cajun or not?’ If so, I need to know the rest of the J2EE community may never support it, and I may be locked into BEA,” Shelton said. The J2EE (Java 2 Enterprise Edition) standard is a blueprint for businesses to write Java software that runs on servers. “It’s true today that 5 to 10 percent of applications could be incompatible,” he said, but with the addition of BEA’s tool “the threat is 25 to 30 percent.”

Being forced to use any company’s technology is exactly what many customers fear most.

“Our directive is whenever and wherever possible, we do not use proprietary extensions unless there’s a significant reason for it. We don’t want to be locked in,” said Mike Dunn, vice president of key technology services at Key Bank. Although his company has decided to use IBM software for now, he is careful to preserve his options to use other technologies.

“The thing we are trying to guard against is you never know when a vendor gets too comfortable with achieving dominance in a particular market,” Dunn said. “Right now, we’re pleased with IBM’s performance, but three years from now, you don’t know.”

His concerns have significant ramifications on the bottom line. As more technologies have become standardized, the cost of moving software from one application server to another has decreased in recent years from about 20 percent of the original cost to about 5 percent, according to a recent report by Giga. But that cost could rise again if new Java incompatibilities make more software adjustments necessary.

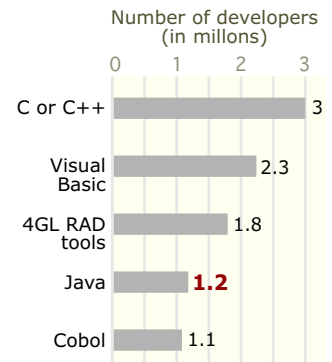
Case in point: Developers for Vignette, which makes software that allows companies to manage Web content, have to rewrite its code to work with application servers made by BEA, IBM and Sun. “They write to the core application server, then we go back and write the specific code for each specific application server,” said Santi Pierini, Vignette’s vice president of product strategy.

Yet even with such complications, he said, Java is still preferable to many alternatives. In the past, for instance, programmers using the C language had to translate its software code to run on all the different versions of the Unix operating system.

“It’s not perfect, but it’s infinitely better,” Pierini said of Java. “I remember when it was trying to get code to run on HP-UX, Solaris and Intel processors. J2EE and Java make the whole process much better.”

## Top five languages

A survey of developers worldwide shows Java was the fourth most popular programming language for 2000.



Source: IDC

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**“If there’s a technology split and the vendors are actively split among themselves, it puts doubt on developers’ minds that Java is a good technology.”**

—Simon Pepper, product director, Iona Technologies

That assessment is echoed by most other Java proponents, who say they can live with the conflicts that result from unsanctioned software development. They argue that 90 percent compatibility is good enough and can be fixed with relative ease.

Giga’s Gilpin, for one, believes a little incompatibility is not necessarily a bad thing. Developers have long invented nonstandard technologies, then submitted them to the standards body for approval—a process that ends up improving Java and keeping it competitive with Microsoft technologies.

“It’s something that has to be done,” Gilpin said. “In any moment in time, there’s always a set of standards and new technologies that go beyond that.”

Indeed, Java Server Pages (JSPs), which allow Web pages to include small Java applications, were not standardized at first. Application server makers all had their own versions of the software before the industry hammered out a JSP agreement as part of the overarching J2EE standard.

Microsoft executives say the Java software makers have no choice but to build proprietary extensions to their application servers.

“It’s pure nonstandard stuff, but it’s how they stay relevant and how they make

money,” said Barry Goffe, group manager for Microsoft’s Enterprise Marketing Strategy Group. “They’re beholden and saddled with J2EE. You’ve got like 10 companies doing the same thing. So it’s how they break out of the pack.”

Rich Green, Sun’s vice president for Java and XML technologies, said the Java companies want to innovate first and standardize later—and he sees nothing wrong with that.

“We would never try to fracture the standard. But if we produce things outside of the standard, people will play with it, and we will put the ‘greatest hits’ in the platform,” Green said. “Developers need to learn and experiment on the job before a standard is produced.”

Regardless of their opinions on the standards issue, Java supporters can always rely on one unshakable common bond: their fervent opposition to stay beyond Microsoft’s grasp.

“Microsoft makes nice tools, but you don’t get a lot of choice. It’s the only game in town,” said Larry Podmolik, chief technology officer of consulting firm LeapNet in Chicago. “Java is not 100 percent ‘write once, run anywhere,’ but it’s pretty darn close.” ■

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## Java jumble

**For many programmers, Java can mean hours of frustration.**

Now Java software makers hope to remedy that by imitating Microsoft, which has excelled at creating easy-to-use development tools.

"It's the next big challenge for Java, and it's an interesting challenge," said Rich Green, Sun's vice president of Java and XML Technologies. "You will see lots of advancements and an increased focus on IDEs (integrated development environments)."

Complaints have particularly surrounded a key piece of the Java standard, Enterprise JavaBeans (EJB). The original intention behind EJBs was to save programmers time. But many say they're finding headaches instead. Compounding the problem is that EJBs, as part of the popular J2EE specification, are often used as the basis for Java products.

"You've got a whole mass of developers out there who are not hard-core technical guys, but are mainstream business application developers in medium to large companies," said John Magee, Oracle's senior director of Oracle 9i marketing. "That's the Microsoft Visual Basic crowd."

The key for Java's continued growth, analysts say, is to emulate Microsoft's work with Visual Studio.Net, which offers integrated features such as testing software for finding bugs, as well

as point-and-click application development. Such simplified tools are also crucial for Java to compete with Microsoft's Web services.

"The problem with the Java community is that no one is giving to developers what they're used to getting from Microsoft," said Sam Patterson, chief executive of ComponentSource, which sells both Java and Microsoft software.

Nearly every established Java software maker, including BEA Systems, Oracle, Borland and SilverStream, and start-ups such as AltoWeb and TogetherSoft, have been working to create easier-to-use development tools.

BEA has made the biggest splash with its forthcoming WebLogic Workshop, a Java tool that allows programmers to build Web services by pointing and clicking. Oracle has released JDeveloper, which features "modeling" tools that allow developers to create graphic representations of software code, as well as testing tools that find ways programmers can improve their code.

IBM and Sun have created competing open-source projects that let software developers choose development tools from different software makers and plug them together. Both aim to integrate Java, so that testing and debugging tools can easily plug in with Java development tools. Eclipse is IBM's effort, while Sun has created a project called NetBeans. ■

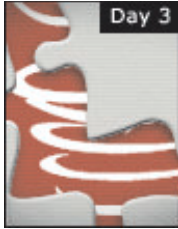
-W.W.

**"We would never try to fracture the standard. But we produce things outside of the standard; people will play with it, and we will put the 'greatest hits' in the platform."**

-Rich Green, vice president for Java and XML,  
Sun Microsystems

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## JAVA JIGSAW

# The enemy: Rhetoric meets reality in Microsoft

BY MIKE RICCIUTI  
March 27, 2002

The war of words between Sun Microsystems CEO Scott McNealy and his counterparts at Microsoft has been raging for so long—and has become so bitter—that it's easy to lose track of what they're fighting over.

**M**cNealy calls Microsoft the “evil empire” and the “dark side.” To him, Microsoft's Outlook e-mail software is “Look Out,” the virus-prone “petri dish of choice on the Internet.” Internet Information Server, software for hosting Web sites and the subject of a Gartner warning, is “the Corvair of Web servers, unsafe at any speed.” Active Directory, used for keeping track of elements on corporate networks, is “Captive Directory,” at the center of Microsoft's “hair ball” of inextricable software products. Finally, Microsoft's .Net strategy to extend its domination of desktop computing to the Internet is “.Not,” “Not Yet” and sometimes “.Nut.”

Microsoft CEO Steve Ballmer says Sun's Liberty Alliance, intended to counter his company's Passport online authentication technology, “has absolutely no probability of mattering to the world.” His predecessor,



Scott McNealy donned a penguin outfit to show his support for Linux, an operating system that rivals Microsoft's Windows.

Bill Gates, criticizes Sun on a more fundamental level: “They think the idea of empowering knowledge workers is a bad idea.”

As the trash-talking continues, however, technology buyers are growing tired of the sideshow. Those in the software business and even

on Wall Street say the bickering is especially irritating now, because with the advent of Web services, the industry needs to focus on some major technological differences between the two rivals that really matter.

Tony Scott, chief technology officer of General Motors, said he and other members of Sun's Liberty Alliance initiative for Web services have little tolerance for the Sun-Microsoft sniping. Sun “is a minority of one in the alliance that thinks the real battle is between Sun and Microsoft.”

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## War of words



"We've got bayonets fixed, and we'll go into any cave no matter how dark and dank it is. And in the air war (against Microsoft to win new developers), we'll go after any developer and not just let them turn over to the dark side."

-Scott McNealy, March 2002



"Sun's pretty much almost about as pure as you can get as a competitor (to Microsoft). Sun believes in expensive hardware. They think that software R&D shouldn't be funded; they think the idea of empowering knowledge workers is a bad idea."

-Bill Gates, June 2001

Scott acknowledges the bickering has become second nature for top executives at both companies but said the rank-and-file developers within Sun and Microsoft are fighting the real battle. "The guys directly involved in producing the tools and technology, no matter what company's name is on the badge, they understand the problems big-time."

Here are some of the key areas where the rhetorical battle ends and the technological clash begins:

### • Development tools

Sun offers SunONE (Open Network Environment), an umbrella name for its Java-based Web services strategy, which includes Sun's Forte development tools, Solaris operating system and iPlanet application server software. Microsoft counters with Microsoft.Net, a far-ranging architecture and tools lineup that includes the Windows XP and Windows .Net Server operating systems; the .Net Framework runtime development system; and the Visual Studio.Net development tool package.

The key differences: Microsoft favors one operating system—Windows—and allows development through tools in multiple languages including Visual Basic, C++, a new Java-like language it developed called C#, and Java itself. Sun allows development on multiple operating

systems including Windows, Unix, Linux and mainframe systems using a single language, Java.

### • Web services

Sun recently disclosed additional plans for hardware and software bundles that put some meat on the bare bones of its Liberty Alliance initiative. The alliance, which includes such heavyweights as General Motors, AOL Time Warner, United Airlines, Fidelity Investments, Vodafone and Visa, seeks to establish a widely recognized authorization system so that people can use a single sign-on for a variety of services. But Liberty hasn't yet released its specification, and many in the industry still view it as a defensive tactic to counter Microsoft's Passport system.

Microsoft says Passport is well-established and already serves as an online identification system for many of its Web properties including Hotmail, the Microsoft Network online service, and the company's developer Web sites. The system will also play a key role in Microsoft's .Net My Services plan, which is still in progress. But Passport has had its setbacks: Despite Microsoft's pledge to open the service to others, privacy organizations and consumer advocates have complained that Passport does not adequately protect consumer information, a charge Microsoft strenuously denies.

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## War of words

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"Ever been in a hailstorm? (code name for Microsoft's Web services plan) I have. I'm from the Midwest. It's billions of balls of ice coming at you from every inch, and there's nowhere to hide—and it destroys everything in its path."  
—McNealy, July 2001



"Sun wraps itself in a mantle of openness and choice. The idea that Java is open is laughable, particularly after Sun submitted Java to a standards body and then broke its promise not just once but twice...Moreover, Sun's idea of choice is you can have any language you want, as long as it is Java."  
—Microsoft statement, August 2001

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**"The rivalry is absolutely real—they each consider themselves the victim of some persecution, and they see each other as the aggressor, a source of all things bad."**

—Rick Ross, founder, Java Lobby Technologies

### • Operating systems

Sun offers its Solaris Unix operating system for its Sparc-based workstations and servers. The company has also ventured into selling Linux-powered hardware as a way to capitalize on that operating system's rising popularity and to steer sales away from Microsoft.

Servers and workstations running Microsoft's Windows have increased in processor power and graphics capabilities to offer lower-cost alternatives to Unix systems. As Microsoft moves further from the desktop PC into enterprise computing sales with Windows, additional clashes are likely. But first, Microsoft needs to ship its twice-delayed Windows .Net Server operating system.

### • Desktop applications

Sun's purchase of the German company Star Division in 1999 gave it a Unix-based competitor to Microsoft's wildly successful Office package of business applications. Sun has been offering StarOffice as a free download, but it doesn't come anywhere close to Office's numbers. Sun also plans to charge an undisclosed price for the Windows and Linux categories of the software beginning with version 6.0 of the product, which sources say is due to arrive in the second half of May, while the Solaris version will remain free.

That could undermine StarOffice's appeal

as a free alternative to Microsoft Office, which contributes at least one-third of Microsoft's overall revenue but has slowed in recent years. New licensing restrictions taking effect soon could force companies to migrate to Office XP, the latest version of the software package, in turn driving revenue.

### • Application servers

Sun offers iPlanet, the merged server software from Sun and Netscape after the latter was bought by America Online in 1999. The iPlanet package includes Web server, directory management and portal tools. While the directory software has been popular, iPlanet overall has been a disappointment since its inception.

Sun is making a renewed effort to turn the package into a cash cow as one of the few tangible ways the company can make money from Java. Sun recently purchased new "clustering" technology to bolster iPlanet. Microsoft sells similar directory, Web server and clustering technologies bundled into its Windows 2000 Advanced Server operating system. It sells a separate product, SharePoint Portal Server, for building corporate Web portals.

### • P2P services

Both companies are experimenting with peer-to-peer technologies for linking multiple electronic devices and their users for sharing messages and data. Sun's

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## Turf war

For years Sun and Microsoft have waged a war of words. Now the battle is over products and strategies. Here are the major areas where they compete:

Area	Sun	Microsoft
<b>Online authentication</b>	Liberty Alliance	Passport
<b>Operating systems</b>	Solaris	Windows
<b>Business applications</b>	StarOffice	Office
<b>Application servers</b>	iPlanet	Microsoft.Net (Windows .Net Server, .Net Framework)
<b>Development tools</b>	SunONE	Visual Studio.Net

vision is Project Juxtapose, or Jxta, an open-source development project that links devices for peer-to-peer computing. Jxta is mostly just a vision, as few companies have experimented with the software.

Sun hopes that it's more successful than its hugely hyped Jini project, which failed to gain supporters because of its requirement that a bulky Java Virtual Machine be installed on small, memory-constrained devices. Microsoft in October of last year made a \$51 million investment in P2P pioneer Groove Networks, founded by Lotus Notes creator Ray Ozzie. It's unclear what Microsoft plans to do with its stake in Groove, but the company is said to be planning P2P technology as part of the next version of Windows, code-named Longhorn. Also, a P2P element could find its way into .Net My Services when the service debuts sometime next year.

Even if all these technological hurdles are resolved, long-standing issues have yet to play themselves out in the courts.

This is why software developers are anxious for Sun and Microsoft to move beyond their petty name-calling and help the industry move forward as it tries to recover from the recession and the dot-com bust.

"The rivalry is absolutely real—they each consider themselves the victim of some persecution, and they see each other as the aggressor, a source of all things bad," said Rick Ross, founder of a developers Web site called Java Lobby and a longtime follower of the Sun-Microsoft clash.

However, he added: "That stuff is old and dead." ■

*News.com's Stephen Shankland and Wylie Wong contributed to this report.*

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JAVA JIGSAW

# The future: Sun pins hopes on Web services

BY WYLIE WONG  
March 28, 2002

On the surface, it sounded impressive: Sun Microsystems was heading a coalition called the Liberty Alliance Project to thwart Microsoft in the promising consumer Web services market, backed by such diverse powerhouses as AOL Time Warner, United Airlines, General Motors and Visa.

**B**ut to many of those within the industry, the announcement last year was little more than a feeble stalling tactic aimed at buying time for Sun to catch up with Microsoft's .Net strategy, a marketing and technology juggernaut that has largely defined the current industry rhetoric over Web services.

Now, the company is beginning to fill in the Liberty initiative's many blanks. In the latest effort to add substance to the alliance's hype, Sun this month announced a new bundle of its hardware and Java-powered software that allows companies to build security systems supporting Liberty's goal of enabling a single electronic sign-on for services, sites and accounts on the Web.

The moves underscore Sun's commitment to grow its business and expand revenue from its Java programming language, which is key to the company's Web services strategy. The efforts also indicate how seriously Sun views

Microsoft as a major threat in this important new market, aiming to create a universal online registration and identity system that rivals the Passport authentication technology at the heart of .Net.

"It will be hard for Sun to steal back mind share, but it makes sense for Sun to pursue Liberty aggressively," Illuminata analyst James Governor said. "It's a chance for Sun to get back in the game and start leading."

Regardless of the odds, it is important for Sun to go beyond empty talk and take tangible measures as a way of restoring confidence in the company's long-term Web services plans. With no defined technology behind its initiative, Liberty was not taken seriously at first and did little to dispel the industry perception that Sun views software as a stepchild business.

Sun admitted that it has lagged behind IBM and Microsoft in forging a Web services strategy for its family of software development

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**"If you read most of the articles out there, you'd think Web services is from some brilliant guy from IBM or Microsoft who has a thought and it becomes a standard by breakfast time."**

-Simon Phipps, chief technology evangelist, Sun

tools and e-business software. But the company, perhaps persuaded by rising frustration on the part of Java licensees over vague plans and constant nay-saying about its rivals' efforts, is taking concrete steps on many fronts in the Web services market.

For example, with the help of Oracle, Cisco Systems and seven others, Sun recently announced it has submitted a new XML (Extensible Markup Language) specification to the World Wide Web Consortium (W3C) that aims to ensure Web transactions happen in the right order, which is vital for a Web service to work.

XML is a technology standard that lies at the heart of Web services, for it essentially erases issues of compatibility among different computer systems. Although Sun was one of the creators of XML, the company has allowed Microsoft and IBM to take charge in developing Web services standards based on the technology—but it is determined to regain a leadership role.

"If you read most of the articles out there, you'd think Web services is from some brilliant guy from IBM or Microsoft who has a thought and it becomes a standard by breakfast time," said Simon Phipps, Sun's chief technology evangelist. "There are actually plenty of other companies out there doing deep thought and advancing XML."

For the past two years, Sun has largely stayed on the sidelines as IBM and Microsoft put aside their competitive differences to spearhead the industry's efforts to build the standards needed for Web services to work.

While Sun has backed each standards effort by Microsoft and IBM, the company has initially been slow to embrace their work. And Sun still has not joined the tandem's latest effort—an industry consortium called the Web Services Interoperability Organization (WS-I)—that was formed to teach businesses how to build compatible Web services.

Sun's refusal to participate has provided ammunition for its rivals, even leading Microsoft Chairman Bill Gates to chastise Sun in public statements. The software giant and IBM have in turn refused to join Liberty, though Microsoft executives say they will consider joining if the alliance stops its anti-Microsoft crusade.

Sun has blamed Microsoft and IBM for its exclusion from the WS-I while at the same time ignoring an open invitation to join. Sun executives say they want to join the coalition but feel that Microsoft and IBM sought to publicly humiliate the company by shutting it out of the group's planning process until only days before its launch.

Today, Sun is campaigning to join the

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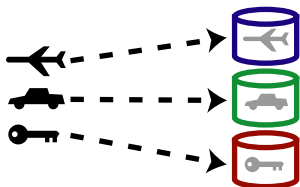
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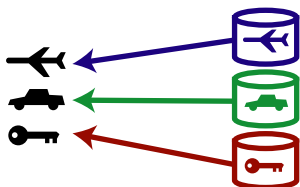
## How Web services work

Web services work on servers to connect Net applications, devices and services. Consumers use the services by accessing Web sites for one-stop shopping through PCs, handhelds, cell phones and even cars.

1. Customer visits airline Web site and requests that he wants to buy an airline ticket, rent a car, and reserve a hotel room.



2. The airline Web site server, linked via XML-based Web services to the servers of other travel-related sites, sends out requests.



3. Rental car and hotel servers receive requests, authenticate customer, make reservations and return confirmations, via XML, to airline Web site servers.

4. Customer trip planned after visit to only one Web site.



group as a founding member so it can help set the group's agenda, but that would require unanimous approval by the board—which includes IBM and Microsoft. The company, originally invited to join as a lower-level contributing member, is still awaiting word from the organization.

Analysts and others in the industry question whether Sun's attempts to cooperate with its rivals, let alone take a lead on Web services, are too little and too late.

"Microsoft and IBM are coming up with a fair amount of the major specifications out there," said Shawn Willett, an analyst at Current Analysis. "Sun hasn't taken the lead in as many things as IBM and Microsoft."

At the same time, analysts say Sun needs to stop sniping at other companies and cooperate more for the good of the entire industry.

"They better wake up to the fact that they need to partner with people and not by saying bad things about Microsoft and IBM," Governor said. "It doesn't make people want to partner with them. There are times when being a maverick is not beneficial, and the creation of standards is possibly one of them."

Rather than taking a leadership role, Sun may have a better chance to leave a mark

**"You can't do everything at once—and (Sun doesn't) have the resources of an IBM or Microsoft."**

—Uttam Narsu, analyst, Giga Information Group

on Web services standards in the security area through Liberty. "Security will be the essential underpinning for Web services, and at the moment, no one has done a good job building standards," Governor said.

Moreover, analysts say Sun's new XML specification—called the XML Pipeline Definition Language—is not as significant as previous work by IBM and Microsoft but does solve an important problem. It helps string together the different steps in a transaction to make sure an XML message or document is received and processed in the right order, said Eve Maler, Sun's XML standards architect.

"There's a valid need for this," said analyst Uttam Narsu of Giga Information Group. "But there's so much activity going around XML today that it's just another XML specification."

Narsu said Sun's efforts to be a leader in Web services standards is noble but might not be possible. The company's energies are already consumed with shepherding the Java standard through the Java Community Process (JCP), a time-consuming endeavor.

"Sun does have people on the W3C and is participating in general," Narsu said, "but they have their hands full with the JCP and Java, so it's difficult to say, 'We will

be a big thought leader in XML as well.' You can't do everything at once—and they don't have the resources of an IBM or Microsoft."

Even if Sun did have those resources, it would face an uphill battle at every juncture against its rivals at this stage. Every company involved in a standards organization has its own proprietary interests at heart, and Microsoft and IBM are no exceptions.

"Standards are all about politics. No one has a right to sit on every standards body," Governor said. "Standards are about getting stuff done and finding the right partners to make things happen." ■

*CNET's David Berlind contributed to this report.*

## In the works

**Sun has its hands on several XML and Web services projects that could change the shape of the industry.**

### **Liberty Alliance Project**

An industrywide coalition Sun launched last year to create a universal online registration and identity system. The goal: Build standards that allow Web surfers to enter sign-on information just once, regardless of the site they choose to visit. This enables businesses to govern who is granted access to network services such as Web-based order forms or stock option plans. Supporters include AOL Time Warner, Nokia and Visa.

### **Java technologies for Web services**

Sun has recently released four Java APIs (application programming interfaces), or sets of instructions, that allow programmers to use the Java language to build Web services. The APIs connect Java applications to XML. They are

- Java API for XML Messaging and Java API for XML-based Remote Procedure Calls, both used for transmitting XML documents over the Web
- Java API for XML Processing, which provides a standard way for processing and reading XML documents
- Java API for XML Registries, which defines the way for connecting to online registries that are akin to a "Yellow Pages" for Web services

### **XML Pipeline Definition Language**

An XML specification that makes sure the many steps in a transaction occur in the right order, which is crucial for a Web service to work. XML, a Web standard for data exchange, is the plumbing technology for Web services. Sun submitted the specification to industry standards group World Wide Web Consortium in March.

### **W3C's Web Services Architecture Group**

Sun is chair of a committee that is defining the architecture needed for Web services and how the various Web services standards fit together.

### **W3C's new SOAP standard**

Sun is in a W3C working group as co-editor for the new version of SOAP (Simple Object Access Protocol), which allows businesses to link to each other and conduct transactions. SOAP was originally created by IBM and Microsoft, which later submitted the specification to the W3C for standardization.

### **OASIS's new security standard**

Sun is chair of an OASIS committee that is working on a standard for authenticating users online, called SAML (Security Assertion Markup Language). OASIS, or Organization for the Advancement of Structured Information Standards, is a consortium of technology companies. ■

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