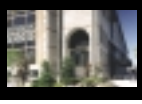


JAVA™ DEVELOPER'S JOURNAL
The World's Leading Java Resource
March 2003 Volume:8 Issue:3

JAVADEVELOPERSJOURNAL.COM

FINAL CONFERENCE PROGRAM p.61

RETAILERS PLEASE DISPLAY
UNTIL MAY 31, 2003
$5.99US $6.99CAN
04>
0 09281 01751 6
SYS-CON MEDIA

Like most developers, you're tired of hearing "more productivity." So we disguised it as a chart.

Crystal Reports 9 Advanced Edition Product Features

POWER	**Report Designer –** Use intuitive visual interfaces and Wizards to create highly formatted reports without any programming	✔	FLEXIBILITY	***Custom Data Access –** Access in-memory data through JavaBeans	✔
	Report Integration – Integrate reports into web, wireless, and windows applications using Java, .NET, and COM SDKs	✔		**100% Java SDK –** Deliver reports in Java applications within a J2EE environment	✔
	***Data Access –** Access virtually any data with native, ODBC, OLE DB, and JDBC connectivity to relational, OLAP, XML, legacy, and enterprise data sources	✔		**Advanced Parameters –** Deliver reports with pre-defined parameters for processing unique report data views at runtime	✔
	Web Report Viewers – Deploy reports over the web with interactive, zero client viewer controls	✔		**Report Creation and Modification APIs –** Use these rich APIs to extend runtime report manipulation and customization to end users	✔
	***Custom Report Style Templates –** Eliminate redundant formatting by creating and applying custom templates across multiple reports	✔		***Unicode Support –** Display data stored in virtually any language in a single report	✔
	***Repository –** Centrally store key report components in the Repository for sharing across multiple reports and single point updating	✔	EASE OF USE	***Formula Workshop –** Use Crystal Reports' extensive formula language for complete, control over report formatting, complex logic, and data selection	✔
	***Report Parts –** Specify existing key report elements, Report Parts, for access via wireless applications and tight integration with web applications	✔		**Guided Navigation –** Establish seamless navigation paths between report objects for an improved end user experience	✔
	Java Viewer – Render reports to pure HTML or WML for mobile clients with a server-based Java report viewer	✔		**Exports –** Integrate multiple export options including XML, PDF, DHTML, Excel, Word, RTF, Text & email	✔

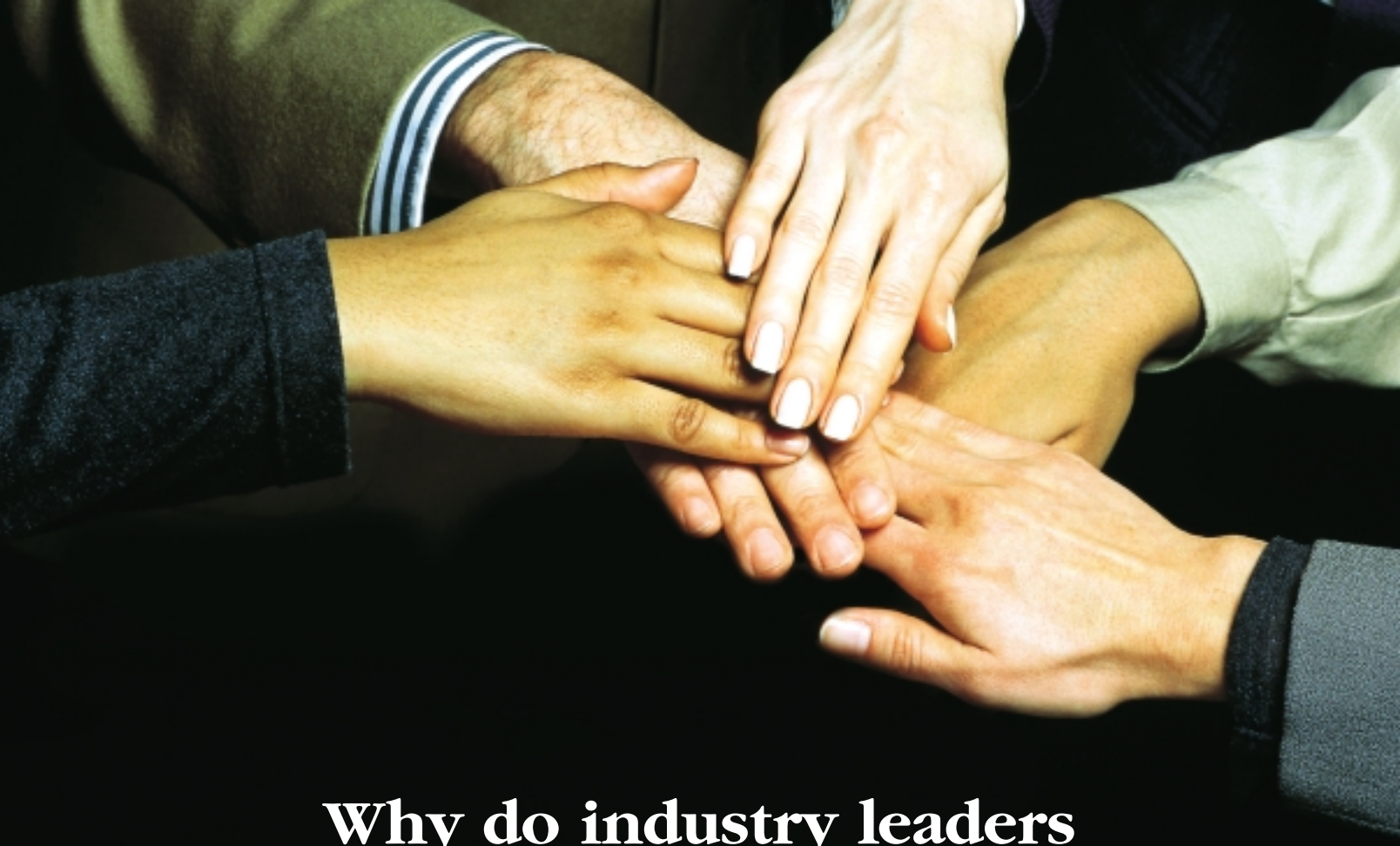
*** New or updated features**

Crystal Reports is an 11th generation high-productivity reporting solution for tightly integrating dynamic content into enterprise web applications using Java, .NET, and COM. Allowing detailed control of end user report viewing, interaction, and runtime modification, Crystal Reports is also a fundamental component of the Crystal Enterprise web-based information delivery system. A world leader in reporting, chosen by technology partners including Microsoft and SAP, Crystal Reports is also supported by a full range of online and onsite training and technical support.

To learn more visit **www.crystaldecisions.com/cr9/218** for free online seminars, demos, and evaluation software. To purchase Crystal Reports, Call 1-800-877-2340, visit our online store at www.crystaldecisions.com/store/218, or contact your reseller.

Access. Analyze. Report. Share.®

crystal decisions™



Why do industry leaders choose Zero G?

Developers already know that Zero G's InstallAnywhere® and PowerUpdate® are critical for their software installation and updating needs. But, buying from us means you get more than just our award-winning multi-platform software deployment solutions. You also get our customer service, our world-class technical support, and best of all, our people – a team of skilled professionals who are committed to the partnership that starts the minute you download one of our products. That's why industry leaders like Sun Microsystems, Novell and Borland choose us.

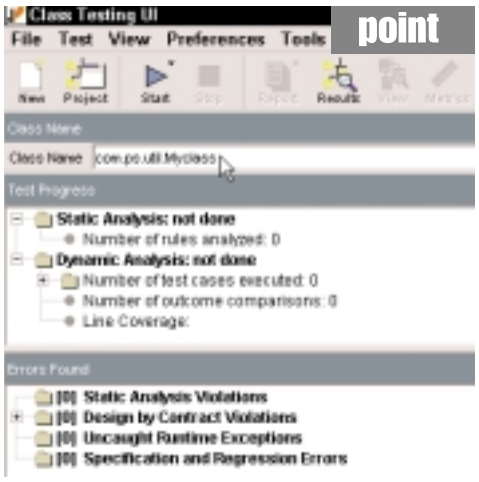
ZERO G

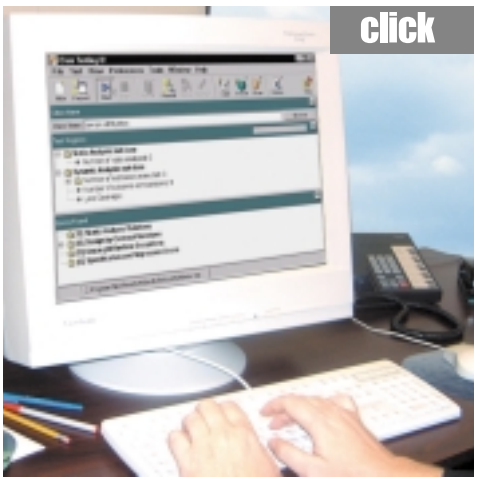
Your software deployment partner

www.ZeroG.com

PARASOFT
"We make software work."

Automate unit test case generation for JUnit and Java™ with Parasoft Jtest.





(It's as easy as 1-2-3.)

Parasoft Jtest is the first and only automated unit testing tool for Java™ development.

With just a click, Jtest reads and analyzes code — quickly creating harnesses, stubs and test inputs — and tests without user intervention. Jtest also enables you to automate regression testing and static analysis. For loyal JUnit users, Jtest is designed to fully support existing test cases and automate the creation of new JUnit-compatible test cases.

Learn how Jtest can enhance JUnit capabilities...
Download a free eval copy of Jtest along with our informative new white paper entitled "Using Jtest With JUnit."

For Downloads go to www.parasoft.com/jdj2. Or call 888-305-0041.

Special Offer:
For a limited time, every 100th customer to download an eval copy of Jtest automatically wins a fully licensed copy — FREE OF CHARGE.

Platforms:
Linux
Solaris
Windows 2000/XP

A part of Parasoft Automated Error Prevention (AEP) Solutions and Services

PARASOFT
jtest®

JAVA DEVELOPER'S JOURNAL

INTERNATIONAL ADVISORY BOARD
CALVIN AUSTIN *(Lead Software Engineer, J2SE Linux Project, Sun Microsystems)*
JAMES DUNCAN DAVIDSON *(JavaServlet API/XMP API, Sun Microsystems)*
JASON HUNTER *(Senior Technologist, CollabNet)*
JON S. STEVENS *(Apache Software Foundation)*
BILL ROTH *(Group Product Manager, Sun Microsystems)*
BILL WILLETT *(CEO, Programmer's Paradise)*
BLAIR WYMAN *(Chief Software Architect IBM Rochester)*

EDITORIAL
EDITOR-IN-CHIEF: ALAN WILLIAMSON
EDITORIAL DIRECTOR: JEREMY GEELAN
EXECUTIVE EDITOR: NANCY VALENTINE
J2EE EDITOR: AJIT SAGAR
J2ME EDITOR: JASON R. BRIGGS
J2SE EDITOR: JASON BELL
PRODUCT REVIEW EDITOR: JIM MILBERY
FOUNDING EDITOR: SEAN RHODY

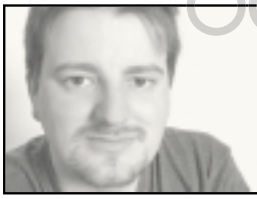
PRODUCTION
PRODUCTION CONSULTANT: JIM MORGAN
ASSOCIATE ART DIRECTOR: LOUIS F. CUFFARI
ASSOCIATE EDITORS: JAMIE MATUSOW
GAIL SCHULTZ
JEAN CASSIDY
JENNIFER STILLEY
ONLINE EDITOR: LIN GOETZ
TECHNICAL EDITOR: BAHADIR KARUV, PH.D.

WRITERS IN THIS ISSUE
JASON BELL, STEVEN BERKOWITZ, MICHAEL BIRKEN, JASON R. BRIGGS, CRAIG DEWALT, CHUCK GAUTNEY, JOEY GIBSON, MARCIA GULESIAN, TERESA LAU, AJIT SAGAR, BERNIE SPANG, MAX TARDIVEAU, DAVE THOMSON, ALAN WILLIAMSON, BLAIR WYMAN

SUBSCRIPTIONS
FOR SUBSCRIPTIONS AND REQUESTS FOR BULK ORDERS, PLEASE SEND YOUR LETTERS TO SUBSCRIPTION DEPARTMENT
SUBSCRIBE@SYS-CON.COM
COVER PRICE: $5.99/ISSUE
DOMESTIC: $49.99/YR. (12 ISSUES)
CANADA/MEXICO: $79.99/YR. OVERSEAS: $99.99/YR.
(U.S. BANKS OR MONEY ORDERS)
BACK ISSUES: $10/EA., INTERNATIONAL $15/EA.

EDITORIAL OFFICES
SYS-CON MEDIA, 135 CHESTNUT RIDGE RD., MONTVALE, NJ 07645
TELEPHONE: 201 802-3000 FAX: 201 782-9600

JAVA DEVELOPER'S JOURNAL (ISSN#1087-6944) is published monthly (12 times a year) for $49.99 by SYS-CON Publications, Inc., 135 Chestnut Ridge Road, Montvale, NJ 07645.
Periodicals postage rates are paid at Montvale, NJ 07645 and additional mailing offices. POSTMASTER: Send address changes to: JAVA DEVELOPER'S JOURNAL, SYS-CON Publications, Inc., 135 Chestnut Ridge Road, Montvale, NJ 07645.



ALAN WILLIAMSON EDITOR-IN-CHIEF

Just Who Owns JRockit!

The Java space is not really unique in this situation, as we contribute our fair share to the computing buzzword thesaurus. So it's not really surprising when someone trips up using the wrong word every so often. They can be forgiven. However, this month I've been researching one particular boo-boo that Mr. Larry Ellison made in his quarterly earnings press conference.

Oracle has always had a reputation of being a rather bold and some would say bullish company. But their latest claim takes them to new heights. One question posed to Larry was about the performance of Java and whether or not Oracle would be working more closely with BEA and their JRockit virtual machine. Larry responded with, "JRockit isn't really BEA's but Intel's…and will be part of Oracle's app server."

Wait a minute, doesn't BEA own JRockit? I am sure they did. Oh well, maybe I have it wrong; it wouldn't be the first time. I pinged an e-mail over to BEA for confirmation; they did indeed confirm that JRockit was 100% BEA owned. BEA responded with, "[We] can assure you that JRockit is owned by BEA." JRockit, originally developed by Appeal Virtual Machines, was acquired by BEA in early 2002. Maybe it was just a one-off slip from Larry.

But Larry continues the distancing of JRockit from BEA: "BEA has no proprietary rights to that whatsoever," citing Intel as the true owners of JRockit. Oh, maybe this wasn't a slip, but a clever subterfuge. Larry continues to reinforce Intel's ownership, "…JRockit technology that we have complete access to, and we have had a meeting with Intel to confirm that."

BEA and Intel have indeed pooled their product engineering efforts to ensure the best possible combination of BEA's JRockit technology on Intel processors, but as far as BEA is concerned, Oracle has not entered into any relationship with them for a similar optimization effort.

Did Larry get it wrong? He was assuring the original person who asked the question that Oracle9*i*AS would be using the latest VM technology from JRockit to ensure it was the fastest application server on the market.

I asked Oracle to comment on this with a series of questions. In true politician style, 50% of the answers I got back are definitely not in response to any of my questions. The other answers from their VP of app server marketing appeared to contradict what Larry was saying in his press conference, with quotes such as "…Oracle's internal tests show that JRockit has performance and stability issues when compared with the currently available JDK 1.4.1 solution from Sun." If this really is the case, shouldn't someone tell Larry that they aren't planning on using JRockit anymore? I am sure BEA will be interested in seeing the tests Oracle has conducted to see if this really is a problem, and I would urge Oracle to share any data they have that might help BEA address any issues. Maybe there's a configuration problem that BEA could assist with.

I hope Oracle gets its message straight sooner rather than later, because I feel it's important to the Java community not to introduce any confusion. It is good validation for us as an industry and with such heavyweights as Oracle and IBM, I feel very confident that Java is here to stay no matter what nonsense is being propagated from the Seattle operating system company.

• • •

I knew this was going to happen at some time: the moment when I would have to whip out my hanky and wave goodbye to a dear friend and wish him all the best. Fortunately that time hasn't come yet. Although that Jason Briggs boy is leaving the post of J2ME editor, he'll be contributing every so often, so we haven't lost his wit and charm completely! Yup, his life is about to get a lot more complicated with the arrival of a brand new Briggs v0.1. So on behalf of the *JDJ* crew, we wish him all the best.

alan@sys-con.com

AUTHOR BIO
When not answering your e-mails and working on the next issue of JDJ, Alan heads up a small team dubbed the "Thunderbirds of the Java industry," providing on- and offsite rescue for Java projects in trouble. For more information visit www.javaSOS.com. You can also read his blog: http://alan.blog-city.com.

Wanted: Java Application with Native OS Look and Performance

WRITTEN BY BERNIE SPANG & DAVE THOMSON

In his editorial "Swing Is Swinging Java out of the Desktop" (***JDJ***, Vol. 7, issue 10) Alan Williamson lamented the current state of Swing and AWT for building competitive desktop applications. One alternative he mentioned is a technology called SWT (Standard Widget Toolkit) that was developed as part of the Eclipse Project (www.eclipse.org). If you're wondering why the Eclipse community, led by IBM, developed SWT instead of using J2SE's AWT or Swing classes, here's the reason.

Eclipse is an open, universal platform for building and integrating development tools. The users of development tools are, typically, developers and they are a demanding lot. So Eclipse had to be designed to deliver a high-performance user experience and integrate well with native operating systems. In the early development phase of the project, the Eclipse developers found that AWT was too limited and Swing did not provide the native integration and performance they needed. Not to say that either is inherently good or bad, just that they didn't meet the requirements of this particular Java application. And that's an important point – the Eclipse platform is a Java application that runs on the J2SE platform.

As Alan pointed out in October, AWT does not provide a satisfying solution for most desktop applications. But Sun provides additional functions in the Swing classes to give Java developers the power of maximum user interface customization and cross-operating system consistency. The power of the Swing classes comes at a price, however, paid in abstraction from the operating system platform and its effect on application performance. In the case of Eclipse, it was not a priority to have an identical user interface across different platforms, but rather to maximize performance and integration and leverage each platform's capabilities. Thus SWT was born.

Swing and SWT both provide a common programming API across multiple operating systems, but that's where the similarity ends. Swing widgets are rendered by Java code, using graphics calls to "paint themselves," while SWT widgets use the operating system widgets directly via J2SE's JNI API. Since SWT is designed to embrace native window systems rather than emulate them, SWT applications have the exact look and feel of the host operating system. This means, for example, that SWT applications pick up the new Windows XP look without any code changes or delay while new emulation code is developed. This design approach also allows an application to leverage platform features such as drag-and-drop and event-merging optimizations. The result is that SWT applications truly look and perform like native applications.

SWT was developed because the Eclipse community needed a high-performance widget toolkit that integrated fully with Windows and other native toolkits such as GTK and Motif. But with the rapid and widespread adoption of Eclipse technology, many developers have found that SWT also answers an important need they have for high-performance native user interfaces in their non-Eclipse–based applications.

SWT is available for anyone to use under a true open-source license, and is developed and maintained by an open-source community. However, many Java developers feel it is time for SWT to be submitted to the JCP to bring it into the Java "fold," so to speak, as an additional user interface option. IBM would likely support a JSR that incorporates SWT as a complement to the AWT and Swing options – along the lines of how Java specifications incorporate support for other open-industry technologies such as XML and SOAP.

At the end of his editorial Alan says, "If you need your faith in Java reenergized, look to the community and what they are doing." We couldn't agree more.

spang@us.ibm.com & dave_thomson@ca.ibm.com

AUTHOR BIOS

Dave Thomson is VP of development at IBM's OTI Labs and led the team that developed the Eclipse technology. Dave is a member of the Eclipse.org board and an IBM Distinguished Engineer.

Bernie Spang, director of WebSphere Studio Marketing, is a computer engineer who led the public launch of the Eclipse project in 2001.

Application Server Experts Agree

"Enterprises that are seeking a well-appointed midtier solution will definitely want to give Oracle9*i*AS a test drive."

InfoWorld

"Oracle9*i*AS is now a formidable application server."

The Middleware Company

"Oracle: one stop app server shop."

eWEEK THE ENTERPRISE NEWSWEEKLY

"[With Oracle9*i*AS,] Oracle is delivering what enterprises need to build a robust, scalable ebusiness infrastructure."

IDC Analyze the Future

Download a free trial now at oracle.com/download.

ORACLE®

Sources:
InfoWorld, November 2002
The Middleware Company, September 2002
eWeek, September 2002
IDC, May 2002

oracle.com/experts or call 1.800.633.1072

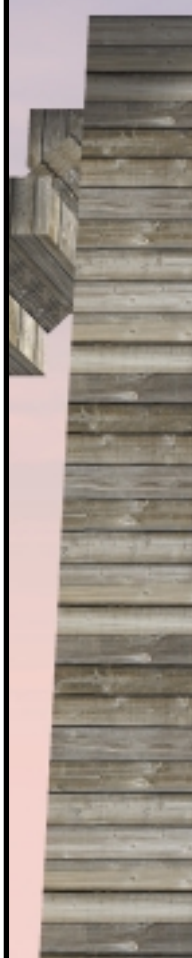
meat fighter

the wiener warrior

by michael birken

Demystifying many aspects of animation and Sound

If you have a bounty of creative energy and way too much time on your hands, why not explore the new Java 1.4 APIs by creating a video game. That's exactly what I did when I produced a parody of Street Fighter II called Meat Fighter (see Figure 1).



"Meat Fighter" is a side-scrolling one-to-one fighting game featuring anthropomorphic hot dogs and sausages. You can choose from six possible players and battle through seven stages of intensive meat fighting. So be prepared to meet the wiener warriors: Sal Lammee, Rat Dog, Oscar M. Wiener, Hot Doug, Cornelius Dog, and Oliver.

In this article, I present a simple framework to enable you to quickly take advantage of full-screen animation, music, and sound effects without learning all the intricate details of the new APIs. (The source code for this article as well as Listings 1–4 can be downloaded from www.sys-con.com/java/sourcec.cfm.) Check out Figures 1 and 2 for screenshots.

Getting Started with Animation

The animation in Meat Fighter, like any animation, is produced by displaying a series of still frames with minute variations in rapid succession. Each frame is generated in layers. For instance, during combat, the background is drawn first, followed by "background ornaments" such as the dancing crab on the beach stage, the fighters, and finally the vitality bars at the top. The element that appears closest to the front is the one that was drawn last in the sequence.

If this layering were done directly to the screen, the animation would appear to flicker wildly because the process of drawing the background erases all the foreground sprites. Instead, each animation frame is generated on an offscreen image buffer and transferred as a whole to the screen. To manage this process, I created the GraphicsSource class and the RenderListener interface.

A class that's interested in generating animation frames implements RenderListener:

```
public interface RenderListener {
  public void init(
       boolean isPageFlipping,
       int bufferWidth,
       int bufferHeight);
  public void updateModel();
  public void render(Graphics g,
       boolean isBufferCleared,
       boolean isPageFlipping,
       int bufferIndex);
}
```

For each frame, GraphicsSource invokes updateModel() to update the state of the game, followed by render() to display the state to the offscreen image buffer. init() is invoked prior to frame generation on a different thread than the one for the animation loop. It should be used for loading images and sounds and for configuring the RenderListener.

All the methods of GraphicsSource are static. To initiate an animation, pass a RenderListener implementation to setRenderListener() and call startAnimation(). startAnimation() expects a frame rate value in frames-per-second (fps). Depending on the frame complexity and the speed of the underlying hardware, maintaining the specified fps consistently through an animation sequence may not be possible. Instead, GraphicsSource tries to sustain the apparent frame rate by assuming that the time required to update the game state is significantly less than the time to display it. It will occasionally and typically unnoticeably invoke updateModel() more often than render() to effectively skip frames. In this way, the game should run at approximately the same speed even on slower computers.

GraphicsSource also provides the means to enter and exit the full-screen exclusive mode via the methods enterDisplayMode() and exitDisplayMode(), respectively. The

FIGURE 1 Intro sequence

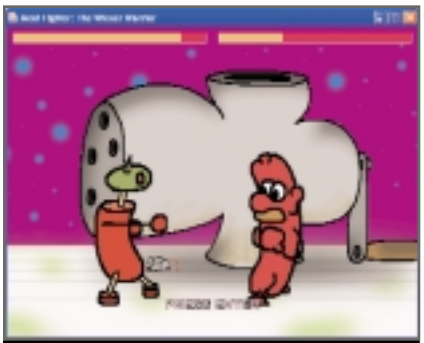


FIGURE 2 Game demo

enterDisplayMode() method requires the desired screen resolution and will attempt to find a mode of that size with the highest bit depth and refresh rate attainable. If the graphics environment cannot provide such a display mode, enterDisplayMode() will create a window with a drawing surface of the specified dimensions, and the game will run outside the full-screen mode. Since enterDisplayMode() also internally configures GraphicsSource for frame rendering, it must be the first method of GraphicsSource invoked.

Listing 1 illustrates all these methods. We'll get back to the arguments of init() and render() in the next section. The listing also introduces ImageSource, a class I created as a façade to the javax.imageio.ImageIO class. ImageSource provides two static methods, getImage() and getImages(), that load a single image and an array of images, correspondingly.

Meat Fighter uses exactly 212 GIFs placed in a directory called images on the same level as the gamingtools directory (see Table 1). Since this directory is within the classpath, the program can locate the files using the system class loader:

```
URL fileURL = ClassLoader
    .getSystemResource(IMAGES_DIR
        + fileName);
```

This technique works even after all the files are bundled into a JAR, which makes deployment one step easier.

Behind the Scenes

The process of rendering to an offscreen image buffer to reduce animation flickering is known as "double-buffering." The offscreen buffer is commonly referred to as the "back buffer" and the other buffer involved, the "front buffer," is the area of video RAM (VRAM) that's read from during the refresh cycle of the monitor to set the intensities of all the pixel phosphors.

Double-buffering is maintained by a java.awt.image.BufferStrategy object created by GraphicsSource.enterDisplayMode(). It will automatically select one of two techniques. If the BufferStrategy employs page flipping, then both the back and the front buffer are allocations of VRAM. The video pointer (a register on the video card) determines which buffer is read from during the monitor refresh cycle. By merely adjusting this pointer, the roles of the buffers are instantly exchanged (see Figure 3). The alternative strategy is bit blitting. In this case, the back buffer may be stored in VRAM or in ordinary system memory. After drawing to it is completed, it's copied to the front buffer (see Figure 4). For obvious reasons, bit blitting is less efficient than page flipping.

DIRECTORY	DESCRIPTION
/gamingtools	Reusable gaming classes not specific to Meat Fighter
/native	Location of the Windows-specific timer DLL
/images	Sprites and backgrounds used in Meat Fighter
/sounds	Sound effects and music used in Meat Fighter
/meatfighter	Meat Fighter–specific classes

TABLE 1 Directory structure of the game

Both strategies accomplish the same goal, but they affect how you must render each successive animation frame. To understand why, consider how to animate Pac-Man wandering around a maze. The simplest approach is to build up each frame in layers as described before. Specifically, draw the entire background image of the maze and then draw Pac-Man at the new location. But, a more efficient approach is to set up a clipping region around the previous location of Pac-Man and then draw the background image. We only restore the part of the maze that was painted over the last time Pac-Man was drawn to the buffer.

With this in mind, if page flipping is used, then even frames are not rendered to the same buffer as odd frames. This means that you must restore the maze considering Pac-Man's location two frames back. If bit blitting is used, you're always rendering to the same buffer; you only need to consider Pac-Man's previous position.

What makes things a little more complicated is that the buffers used by BufferStrategy are usually of type java.awt.image.VolatileImage. A VolatileImage offers significant performance benefits over other kinds of images because it stores the image contents in VRAM. However, VRAM is a limited resource and the operating system and other applications can borrow that memory for their own purposes at any time. For example, if a screen saver starts running in the middle of the game, since it's also a full screen application it will take away at least the memory used by the front buffer. After the screen saver stops, the VolatileImage will reallocate the VRAM, but by then the contents of the buffer are lost.

If the game is drawing to a buffer at the moment its contents are lost, no exceptions will be thrown. Instead, BufferStrategy provides methods that indicate if the contents of a buffer are still the same since the last time a graphics context was obtained for it; this information is passed to render() as the boolean parameter isBufferCleared. render() also receives an integer called bufferIndex that alternates between 0 and 1 when page flipping is used to indicate which buffer g refers to. It's always 0 for bit blitting.

When you call setRenderListener(), GraphicsSource calls back init() and passes it the type of buffer strategy in use, as the boolean isPageFlipping, and the dimensions of the buffers. GraphicsSource also assumes that the program is entering a new animation sequence and the contents of the buffers are no longer valid. This means that if page flipping is used as the buffer strategy, then isBufferCleared is set to true for the first two callbacks of render() directly after invoking setRenderListener(). Similarly, isBufferCleared is set to true for the first callback of render() if bit blitting is used. This saves you the trouble of writing special logic to initialize the buffers when the background changes for a different part of the game.

The Animation Loop

GraphicsSource.startAnimation() creates a thread that loops and calls back the methods of RenderListener until stopAnimation() kills it. The loop depends on high-resolution timing to decide when to invoke updateModel() more often than render(). I abstracted the concept of the timer into an interface called StopWatch:

```
public interface StopWatch {
  public void start();
  public long stop();
  public long getResolution();
}
```

start() begins timing and stop() returns elapsed time in nanoseconds (10^{-9} seconds).

getResolution() returns the error expected in the measured elapsed time, meaning the actual elapsed time is somewhere in the range of the measured elapsed time plus or minus this value.

My simplest implementation of StopWatch uses System.currentTimeMillis(); however, as the Javadoc explains, "While the unit of time of the return value is a millisecond, the granularity of the value depends on the underlying operating system and may be larger." On my Windows XP box, I measured the resolution to be approximately 15ms. This is not good considering that at 60fps, the frame period is less than 17ms.

The Java Media Framework (JMF) and the Java 3D API (J3D) provide the high-resolution timers javax.media.SystemTimeBase and com.sun.j3d.utils.timer.J3DTimer, respectively. Although SystemTimeBase provides a getNanoseconds() method, I found it just as inaccurate as System.currentTimeMillis(). It may perform better on your box. J3DTimer, on the other hand, provides excellent high-resolution timing with a granularity less-than 1000 ns on my machine.

Resolution aside, the disadvantage of using these implementations is that JMF and J3D are not included as part of the standard installation of the Java 2 Runtime Environment (J2RE), which limits your gaming audience. So, I turned to the Java Native Interface (JNI) and created a DLL in Visual C++ that wraps the Windows functions QueryPerformanceFrequency() and QueryPerformanceCounter(). On application startup, a 40KB DLL is copied to the temporary directory defined by the system property java.io.tmpdir unless it's already located there. This is necessary because System.load(), used to load the DLL, cannot access files within a JAR.

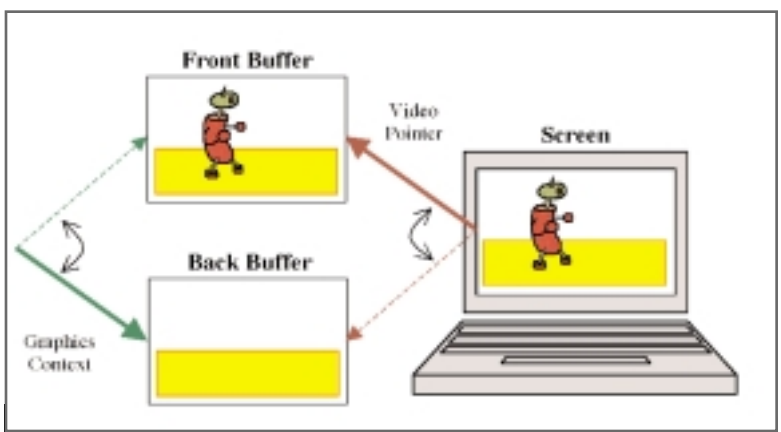


FIGURE 3 Page flipping

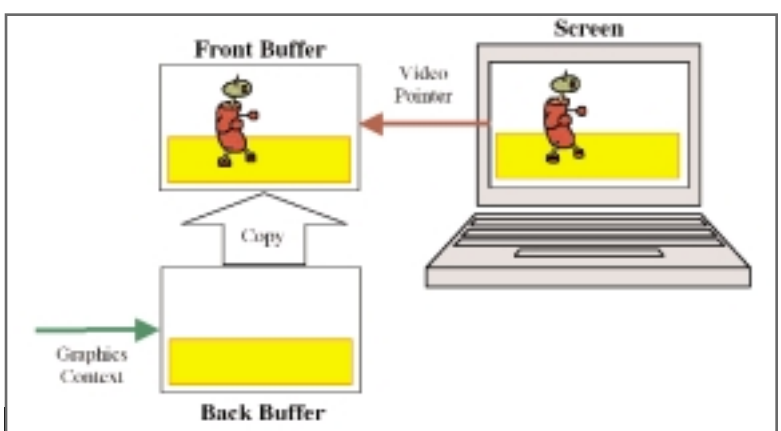


FIGURE 4 Bit blitting

StopWatchSource provides the static method getStopWatch(), which obtains the best available StopWatch implementation. To do so, it creates a List and adds the System.currentTimeMillis() implementation available on all platforms. Next, if JMF or J3D is installed, it will add their associated implementations. If the operating system is a version of Windows, it adds the JNI implementation. Finally, it sorts the List and returns the StopWatch with the highest resolution.

Listing 2 shows the animation loop in GraphicsSource that relies on StopWatch. The loop updates the game state and renders it, and then it sleeps for any time that's left over in the frame period. It computes the sleep time as:

```
long sleepTime = PERIOD
    - stopWatch.stop() - overSleepTime;
```

where PERIOD is the frame period and stopWatch.stop() returns the time expended in the last iteration while not asleep. Since Thread.sleep() is not accurate to the millisecond either (usually off about 1ms), we measure the actual sleep time and subtract that value from the sleep time of the successive iteration. This is the overSleepTime.

If sleepTime is negative, the duration of the last iteration exceeded the frame period. The overshoot, equal to -sleepTime, is typically a fraction of a frame period; it's added to a total called fractions. When fractions grows larger than the frame period, the animation is at least an entire frame behind. To compensate, the while-loop on line 57 invokes updateModel() for an additional fractions/PERIOD time(s) and leaves fractions with any remainder.

It Gets Easier

To create an animation frame without redrawing the entire background, render() requires access to the "dirty regions" of the buffer it's acting on. These are the rectangular areas made "dirty" as the result of drawing sprites on top of the background. If page flipping is used as the buffer strategy, you need to maintain two sets of dirty regions, one for each buffer. Bit blitting requires only one set.

To automatically maintain these sets, I created an abstract class called FrameBuilder. FrameBuilder implements the methods of RenderListener and actually declares them final to prevent you from overloading them. In this case, a class that desires to generate animation frames extends FrameBuilder and implements the five abstracts methods listed in Table 2a.

init()is called back soon after you pass the FrameBuilder reference to setRenderListener(). As before, it's invoked on a different thread than the one used for the animation loop; it can make blocking calls, such as loading images and sounds, without interrupting a running animation. After it returns, GraphicsSource switches to the new class to generate the frames.

The two overloads of renderBackground() are for drawing the entire background and for restoring a specified dirty region. The former version is invoked when the buffer contents are lost or isBackgroundSame() returns false. The latter version is called once per dirty region and is passed a graphics context with a clipping region set accordingly.

renderForeground() is invoked to display sprites and other graphics on top of the background. It should use the concrete methods listed in Table 2b. markDirtyRegion() records a dirty region for restoration in a successive frame. drawSprite() is a convenience method that invokes g.drawImage() followed by markDirtyRegion().

updateState() serves exactly the same purpose as updateModel(). An alternative method is used because isBackgroundSame() is actually checked in FrameBuilder's implementation of updateModel() instead of render(). This

xmlspy 5®

Code Generator

>>Why be a plumber if you could be an architect?

Let xmlspy 5 handle the dirty work of writing thousands of lines of low-level infrastructure code. Focus on implementing your business logic to build better quality XML applications, faster<<

Download a FREE Trial Now!

Generate Program Code

XML integration project backed-up? No surprise, considering the thousands of lines of application plumbing - infrastructure code, required to load, persist, validate, and perform other routine operations on XML documents within a software application.

xmlspy 5 Enterprise Edition now includes a code generator! Graphically model data elements in XML Schema, then **xmlspy 5** generates the corresponding class files. Output code is completely customizable using industry standard API's for programmatically accessing XML documents, including C# (.NET XML), Java (JAXP) and C++(MSXML).

XML application development just got cleaner, thanks to the new **xmlspy 5** code generator! Finally, XML software applications without the headache. It's no wonder that **xmlspy 5** is the industry standard XML Development Environment used by a million software developers worldwide!

http://jdj.altova.com/code

ALTOVA®

www.altova.com

way FrameBuilder is able to keep track of background changes even when frames are skipped. *Note:* updateModel() delegates the call to updateState() before the check since isBackgroundSame() depends on the current game state.

It's important that these methods avoid creating temporary objects because the incremental garbage collection that occurs to clean up those objects will introduce noticeable pauses.

Listing 3 demonstrates a class that extends FrameBuilder. Observe that the code is completely oblivious to the buffer strategy. In this case, renderBackground() cleans up the dirty regions by invoking its overloaded counterpart. It can do this because its clipping region is automatically set to the dirty region. If you're developing a game like Pac-Man that uses tile graphics, you should provide logic that identifies and redraws only the dirty tiles (see Tile Graphic sidebar).

Returning to the subject of VolatileImages, sprites can also take advantage of them for the rendering performance benefits. To accomplish this, you would load an image into a nonvolatile form like a BufferedImage and then copy it to a VolatileImage for drawing. If the contents are ever lost, you can restore it from the nonvolatile version.

Luckily, BufferedImage already has this mechanism built in. When a BufferedImage is drawn repeatedly to a buffer in VRAM, Java 2D will automatically create a VolatileImage version of it so that future rendering may perform better. This being the case, ImageSource.getImage() returns a BufferedImage. The data layout and color model is set in accordance with the graphics configuration for optimal bit blitting.

Scrolling

If you load a background image wider than the screen, you could scroll it horizontally by redrawing it at different positions; however, this means you must paint the entire back buffer for each frame. Alternatively, you could allocate buffers wider than the screen in VRAM and adjust the video pointer offset so that the visible area of the front buffer changes. Since bit blitting is not used, this type of scrolling has no impact on performance whatsoever.

Unfortunately, BufferStrategy doesn't yet provide fine control of the video pointer; it's only capable of flipping the pointer between buffers. As such, Meat Fighter scrolls the background using the former technique, which is significantly slower. However, the background is not in continuous motion. It responds to the player's position; it's occasionally stationary and isBackgroundSame() returns true when the background position has not changed.

Sound Effects and Music

One of the coolest features of Java that actually evolved from the applet era is a simple interface for playing sound effects and music. The static method Applet.newAudioClip() obtains an AudioClip from a specified URL. AudioClip is an interface with three methods: play(), loop(), and stop(). It couldn't be easier.

However, after calling play(), there's no way to know when the audio ends. Such a feature is necessary for coordinating animation sequences with sound. For example, the animation at the start of Meat Fighter does not enter into the demo stage until the introductory music completely finishes.

To overcome this limitation, I created the AudioListener interface and an extension of AudioClip called Audio:

```
public interface AudioListener {
  public void audioStopped();
}

public interface Audio
    extends AudioClip {
  public void setAudioListener(
      AudioListener audioListener);
  public void clearAudioListener();
  public void dispose();
}
```

A class implements AudioListener to receive notification that a sound effect or a piece of music has completed playing. This listener is registered with an Audio object via setAudioListener().

Audio objects originate from the static method AudioSource.getAudio(). AudioSource uses the same technique as ImageSource to locate files within the classpath and it expects to find audio files in the sounds directory on the

(2A) ABSTRACT METHODS

void init()
void updateState()
boolean isBackgroundSame()
void renderBackground(Graphics g)
void renderBackground(Graphics g, int x, int y, int width, int height)
void renderForeground(Graphics g)

(2B) CONCRETE METHODS

void drawSprite(Graphics g, Image image, int x, int y)
void markDirtyRegion(int x, int y, int width, int height)

TABLE 2 Methods of FrameBuilder

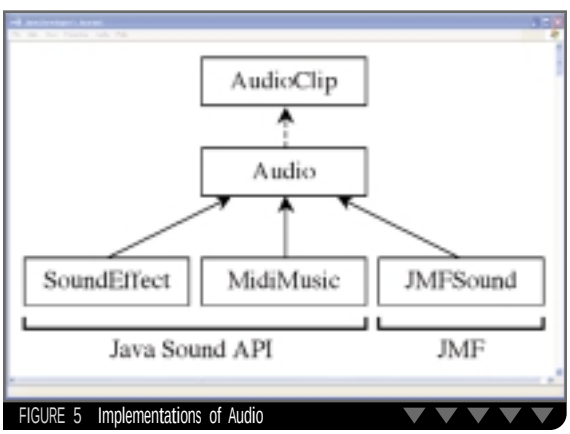


FIGURE 5 Implementations of Audio

JAVA GAME PROFILE (JSR-134)

Imagine if you could take that Java game you're working on, burn it onto a CD, pop it into your PS2 or Xbox, and actually play it. As Java programmers, we're used to porting our applications from one platform to another without any coding changes; why not apply the write once, run anywhere principle to game consoles?

The Java Game Profile (JGP) is an accepted Java Specification Request, designed with the help of companies like Sega and Sony, with the goal of developing a platform-independent standard for game development. Its ultimate goal is to rid the world of game ports by providing Java-based libraries capable of taking advantage of the high-performance graphics hardware found in modern game consoles as well as your PC. The proposal covers 2D and 3D graphics, streaming media, sound, controllers, physics modeling, and network communications, among other topics. It highly promotes leveraging existing APIs whenever possible and creating new APIs as needed to fill in the gaps. A game-specific API in the javax.games package would act as a layer above them all. For example, the proposal suggests classes for modeling features commonly found in game characters that rest on top of the Java 3D API.

Sony already encourages hobbyists to develop for the PS2 via its $200 Linux Kit. The kit includes a 40GB hard drive, an Ethernet adapter, keyboard, mouse, monitor cables, and the Linux software, which effectively turns the PS2 into a desktop computer. However, until Sun releases a JVM for it, it looks like you'll be stuck with gcc.

As for the Xbox, since it took a federal court to order Microsoft to distribute a modern JVM with Windows, it does not seem likely that Microsoft will participate in the JGP anytime soon. Almost unsurprisingly, hackers have managed to get a version of Linux running on the Xbox. But, if the JGP is going to be an attractive option for game companies as well as hobbyists, more console manufacturers will need to get involved.

You can view JSR-134 at www.jcp.org/en/jsr/detail?id=134. The JGP white paper, a document presented at the Game Developers Conference 2002 detailing JGP beyond JSR-134, has not been released to the Web at the time of this writing.

TILE GRAPHICS

Tile graphics evolved from the earliest text-based games, where ASCII characters were arranged to form images of maps and objects in the game world. In those days, tiles served two primary purposes. First, they saved precious ROM space. For example, the 224x288 maze in Pac-Man actually consisted of 28x36 square tiles, each 8x8 pixels in size. Second, tiles provided a convenient method of bestowing a repeated behavior upon the game world. For instance, in Super Mario Brothers, the tiles that Mario walked on, which often hung in midair, all shared the behavior of a floor-like surface. Modern releases for systems like the handheld Nintendo Game Boy Advance still use tile graphics for exactly the same reasons.

To use FrameBuilder for a game like Pac-Man, you need a way to transform a dirty region into a set of dirty tiles. Assume the 28x36 maze is represented as a two-dimensional integer array of constants, each associated with a particular tile graphic. The ghost monsters and Pac-Man consist of 16x16 pixel sprites; rendering any of them means making nine of the 8x8 background tiles dirty. Given a sprite position (*x*,*y*), you can find its corresponding array element by dividing each coordinate by 8. Alternatively, you can right-shift by 3, an equivalent operation that takes less time to execute. Apply this to opposite corners of the sprite to compute the dirty tile region. *Note:* Pac-pellets are background tiles, not sprites. As Pac-Man gobbles them up, adjust the array elements accordingly and Pac-Man's position will automatically force the pellet tiles to be repainted.

A Super Mario Brothers type game presents a different challenge because the tiled backgrounds are one screen high and multiple screens wide. The Nintendo Entertainment System used 8x8 pixel tiles in a 32x28 grid to form 256x224 sized screens. Its hardware provided a wraparound buffer and the ability to adjust the video pointer within the buffer for scrolling. Since BufferStrategy does not support an equivalent, the entire back buffer needs to be repainted for each frame. One approach is to maintain two screen-sized segments of the background as BufferedImages and scroll from one to the other by drawing them end-to-end. As the first image is scrolled off, it would be incrementally updated one new column of tiles at a time. When the second image is completely in view, the first is ready to serve as the next segment.

same level as the gamingtools directory (see Table 1). Call dispose() after an Audio object is no longer required to release system resources that it may be holding. Listing 4 demonstrates how to create an Audio object and how to associate an AudioListener with it.

AudioSource.getAudio() returns one of three implementations of Audio depending on the file type (see Figure 5). SoundEffect and MidiMusic use the Java Sound API, which is part of the current J2RE installation, to provide sampled and synthesized sound, respectively. SoundEffect is capable of playing AIFF-C, AIFF, AU, SND, and WAVE files, and MidiMusic is capable of playing MIDI files. The quality of synthesized sound will vary depending upon which soundbank was shipped with the J2RE. A soundbank contains sound samples for an array of instruments. Typically, the J2RE installation includes the smallest and lowest quality one. See the links in the References section for information on how to determine which soundbank you're using and where to get a better one if required.

The Java Sound API does not provide support for MP3 files as of this time; however, the Java Media Framework (JMF) does and it's used by JMFSound. JMFSound is actually capable of playing all the sound file formats mentioned earlier in addition to MP3. The disadvantage of using it, as mentioned previously, is that JMF is not included in the standard J2RE installation. *Note:* The latest release of JMF actually removes some MP3 functionality due to "licensing issues," but you should still be able to play them under Windows.

Author Bio

Michael Birken is actively involved in the design and research of emerging trading technologies at a Manhattan-based financial software company. He's a Sun Certified Java programmer and developer. Michael holds a BS in computer engineering from Columbia University. Michael is a vegetarian.

Deployment

I JARred up all the resources into meatfighter.jar using this command:

```
jar cvfm meatfighter.jar theManifest
    gamingtools meatfighter native
    images sounds
```

The m option directs the JAR utility to use the manifest file, theManifest, instead of creating a default one. TheManifest is a one-line text file that specifies the class containing the main() method:

```
Main-Class: meatfighter.MeatFighter
```

You can launch Meat Fighter via:

```
java -jar meatfighter.jar
```

Alternatively, under Windows, you can double-click on the JAR to start it.

To promote reusability, I also created gamingtools.jar, which contains the gamingtools package and the native directory. You can find these JARs along with their complete sources on my Web site, www.meatfighter.com. All the code is covered by the GNU General Public License, so feel free to redistribute, modify, and use it in your own programs at no cost.

Conclusion

Since I posted Meat Fighter, I've received only positive feedback and a wealth of questions from enthusiastic Java game programming hobbyists. I hope this article has demystified many of the aspects of animation and sound and serves as a springboard for your creative energy. Unfortunately, at least for now, Game Over Man!

References

- *Meat Fighter:* www.meatfighter.com
- *Full-Screen Exclusive Mode API:* http://java.sun.com/docs/books/tutorial/extra/fullscreen/
- *Java Image I/O API:* http://java.sun.com/j2se/1.4.1/docs/guide/imageio/
- *The VolatileImage API User Guide:* ftp://ftp.java.sun.com/docs/j2se1.4/VolatileImage.pdf
- *Java Sound API:* http://java.sun.com/products/java-media/sound/
- *Java 3D API:* http://java.sun.com/products/java-media/3D/
- *Java Media Framework:* http://java.sun.com/products/java-media/jmf/
- *Java Native Interface:* http://java.sun.com/docs/books/tutorial/native1.1/
- *JSR-134:* www.jcp.org/en/jsr/detail?id=134
- *PlayStation 2 Linux Community:* http://playstation2-linux.com/
- *Xbox Linux Project:* http://xbox-linux.sourceforge.net/
- *Nintendo Entertainment System Architecture:* www.zophar.net/tech/files/nes.txt
- *Swing Sightings Volume 3:* http://java.sun.com/products/jfc/tsc/sightings/S03.html
- *Java Gaming:* www.javagaming.org
- *Video Game Music Archive:* www.vgmusic.com/
- *Drawing Tablets:* www.wacom.com
- *History of Street Fighter:* www.videogames.com/features/universal/sfhistory/

o_1@hotmail.com

Rational XDE Professional Java Edition is:

UML modeling for Java

model ↔ code synchronization

automated design documentation

customizable design patterns

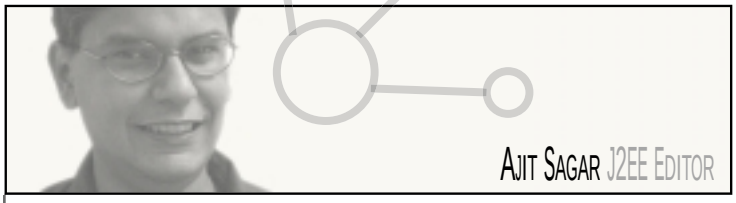
data modeling

and runs inside WebSphere Studio

In other words,
your IDE on steroids.

Lemme guess. You're thinking this is just one more tool that's actually going to get in your way. Hardly. Rational® XDE™ Professional blends right into your development experience. How? It runs inside IBM® WebSphere® Studio Application Developer, or stands alone with its own Eclipse-based Java™ Integrated Development Environment. It supports J2EE and J2SE. And Rational XDE support also includes membership to the Rational Developer Network,SM a helpful online community that provides reusable assets, Web-based training and discussion forums. We figure if someone else has already solved a problem, why should you have to do it again? To create a better development experience without creating new problems for yourself, get Rational XDE starting at only $1,595. Or go to www.rational.com/offer/javacd2 to get a free Rational XDE Professional Evaluation CD so you can see it and try it out for yourself.

be liberated | Rational® the software development company



AJIT SAGAR J2EE EDITOR

Living Inside the Box

One of my recent clients had an entire suite of applications that was built on an in-house messaging framework. Several years ago, when not many Java frameworks existed in the market and J2EE was still a few years away, this would have been considered a good thing; today, any new development on a proprietary framework takes the client further away from fully leveraging the facilities offered by J2EE. Although there is definitely a strong push to move to a J2EE enterprise type of environment, migrating legacy systems to J2EE is a formidable undertaking.

While this problem can be tackled in a piecemeal manner, one of the main issues in such an environment is the inability to conceptually move outside the box. Two main thoughts float up in any architecture initiatives – EJBs are slow and applets are bad. These opinions are based on some antiquated information, but can also be attributed to slowness on the part of the vendors to support enterprise APIs. Case in point, not all the leading J2EE vendors are EJB 2.0 compliant. And EJB 2.0 is really the first release that makes EJBs worth using in a large enterprise. Alternatives such as JDO have only recently appeared on the horizon.

In the absence of the main mechanisms for synchronous communication, what should you resort to? Messaging, of course. You can achieve every form of integration with a true and tested MOM and, for the most part, synchronous calls can be simulated through messaging. However, there is obviously a price to pay – performance. But if this is now the accepted norm, any new development needs to stay in the same box.

How did it come to this? I'd say J2EE vendors are to blame. The Java platform is oversold in terms of its capabilities and promise of future enhancements. Then it takes a long time for the market to catch up on the promise (we all know about the delays in subsequent releases). In the meantime, the enterprise tries out what currently exists in the platform, makes go/no-go decisions, tables the rest for later, and moves on. Moving on means that after evaluating the alternatives, more in-house development takes place than necessary, and product suites are built with an eye on the future and migration strategies in place. However, the longer it takes for the platform to mature, the more the clients become ensconced in temporary solutions.

At the end, when vendors do come with a richer set of offerings that can address enterprise issues, it's too late to move the customer out of the box in which he or she is now comfortably asleep. As a result, full-fledged J2EE application server environments end up being used for only a fraction of their abilities, such as serving up Web pages.

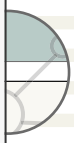
One factor that consolidates the execution and development environment is the right IDE. Disparity in IDEs and their capabilities confuses the issue of the capabilities of J2EE and its execution environment. Fortunately, there are initiatives in the industry for creating a common API for Java development tools. JSR 198 - the Standard Extension API for Integrated Development Environments, recently submitted by Oracle, is an attempt to tackle disparity in IDEs.

ajit@sys-con.com

AUTHOR BIO

Ajit Sagar is the J2EE editor of JDJ and the founding editor of XML-Journal. He is the director of engineering at Controlling Factor, a leading B2B software solutions firm based in Dallas, and is well versed in Java, Web, and XML technologies.

J2EE INDEX



Get beyond metrics.

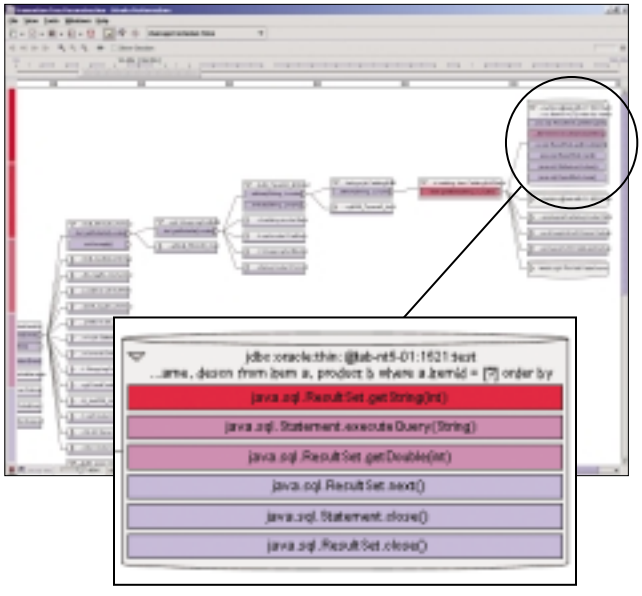
PerformaSure™

Now part of QUEST SOFTWARE

Reach your J2EE performance goals.

Metrics are useful. In fact, they're often the first step in uncovering a performance problem in your J2EE systems. But let's face it, it's not enough to detect the symptoms of a problem. You still need to solve it. That's why PerformaSure correlates all metrics with individual transaction response times. It's the difference between performance intelligence and just plain data.

Our exclusive Tag and Follow technology traces the end-to-end execution path of transactions through each component and server of a distributed J2EE system, with method-level timing captured every step of the way. Hotspots are intuitively color-coded for further drill-down. The result? Faster, more accurate performance analysis so you can reach your performance goals sooner.



The Transaction Tree provides an end-to-end method-level view of any transaction's path through the distributed J2EE system. Clearly see component interactions within the application architecture on a per-transaction basis, with performance hotspots highlighted in red.

Track down J2EE performance problems including:

- inefficient and excessive database calls
- inefficient servlets, JSPs, EJBs, and Java classes
- network misuse including frequent/large object serialization
- application server settings that limit scalability (EJB caching, JDBC pool sizes, etc.)

Take a walkthrough of PerformaSure today at:

www.sitraka.com/performasure/jdj

sitraka

Interview with Borland

JDJ Asks . . . Borland

Tony de la Lama is vice president and general manager of Java solutions for Borland. He is responsible for the strategic and technical direction, business development, engineering, and marketing efforts of Borland's core Java products, including the JBuilder development platform. *JDJ* readers asked him the following questions about Borland and Java.

<john rogers>: **I have been a long-time supporter of Borland, all the way back to the Turbo Pascal days – what a great product! I also love JBuilder, but I'm an independent consultant and I'm having a hard time keeping up with the upgrade costs. There are two problems. One, some of the product features that I need are in the "Enterprise" version, but I'm not a "big enterprise" and find that the price of the enterprise version crushes my less than enterprise budget. The second problem is that full version upgrades are coming out twice a year, and there seems to be little price breaks for your loyal followers who try to upgrade all the time. I understand that license revenues fuel the development of additional features, but I think it would be great to have some sort of subscription (say $500 to $1,000 per year) to ease my small company (just me – president and peon) budget.**

<tony de la lama>: We've heard from a number of customers like you who would like to move toward a subscription model and, of course, we took the feedback to heart. With the release of JBuilder 8, we introduced a software assurance program that includes support and all upgrades for a year for JBuilder Enterprise for $750. This is, of course, renewable. It sounds like this is exactly what you're looking for.

<dan doyle>: **Will there be a forward evolution of JBuilder with TogetherSoft as a complete project management tool? What does Borland view as a complete project management toolset?**

<de la lama>: We're releasing the initial integration of JBuilder and Together JBuilder Edition in the first quarter of 2003. This is a great step forward but only the beginning of the tight integration you will see between these products.

Your second question is very interesting. Borland is committed to delivering a complete application development life-cycle solution that includes design, development, requirements, and configuration management and testing. Our Java development solutions for these activities are Together JBuilder Edition, JBuilder, StarTeam EE, Optimizeit Suite, and Optimizeit ServerTrace. These products support all the major deployment platforms, including BEA WebLogic, Borland Enterprise Server, IBM WebSphere, Oracle, and Sun ONE.

<mileta cekovic>: **JBuilder has been my favorite Java IDE for years (and I also used Turbo Pascal, C++, and Delphi), but despite its six-month release cycle, it seems to me that JBuilder is losing its technical superiority against the competition and is playing catch-up more and more (refactoring, code formatting from IDEA, Struts integration from JDeveloper…). I'm not saying that JBuilder copied particular implementations from other IDEs, but that it's copying ideas from other IDEs. Will JBuilder continue to add original new productivity features and maintain technical leadership or just copy others' ideas ?**

<de la lama>: I can't agree with your assertion that JBuilder is playing catch-up. JBuilder is the number one development environment for the Java platform. It's built by developers, for developers, with their needs at the center of its design. It's clearly the developers' favorite choice for a productive, easy-to-use Java development environment.

Of course, other vendors bring out new features – some are successful; many fall flat. As Borland and other players in the Java industry continue to innovate, the best features will be adopted on a broad basis. However, the industry is moving beyond point features. Now it's about how well products integrate the phases of the application development life cycle and integrate with other products. What good is an IDE if it doesn't integrate well with different application servers? Enterprise Java development now requires performance profiling as a part of unit testing. Why would developers want to leave their IDE to run unit tests and performance profiling? That's really where the differentiation is occurring.

That being said, JBuilder will continue to evolve and deliver the cutting-edge productivity features and ease of use that have made it number one.

<gerard lambert>: **How will you manage the competition of Rational Rose (included in Borland Enterprise Studio) and the modeling tool that will result from the acquisition of TogetherSoft?**

<de la lama>: That's pretty straightforward. Rational Rose has been replaced in Borland Enterprise Studio for Java with what we believe is a far superior product – Together JBuilder Edition.

<m. allen>: **Why would I want to pay such a price for Java tools, when I can find comparable tools at a much lower cost?**

<de la lama>: I love this question. What you're really asking is "Why is JBuilder number one?"

Developers have figured out that JBuilder is the best environment to boost their productivity and to make complex or tedious tasks easier – that's the main reason people buy tools like JBuilder. JBuilder is designed around Java developers and their role, by Java developers. JBuilder supports open, standards-based Java solutions. JBuilder gives you the freedom to choose your deployment platform and Borland will be here to support you tomorrow.

<kurtis williams>: **Product after product, Borland's offerings almost always stand head and shoulders above those produced by other companies. JBuilder is no exception. Some of those companies (most notably one) invest substantially more in both capital and resources. How is Borland able to consistently achieve this level of quality, functionality, and stability?**

<de la lama>: This really comes down to philosophy. Borland is about developers and open standards. We've touched upon this several times. Developers are at the center of design of every Borland product. We don't spend money developing proprietary standards or extensions so that developers are hooked on Borland products. We spend our resources developing best-of-breed solutions that make developers' lives easier and free them from lock-in to stack ven-

dors. Developers continue to buy Borland products – not because they're hooked and switching costs would be staggering – they're not. Developers continue to buy Borland products because they like them and they meet their needs better than any other product.

<matt olsen>: **There has been a recent trend in the Java/XML development tool industry to label products "Enterprise," move some functionality from their other offerings to the Enterprise version, and then charge a premium for that Enterprise edition. Borland has always had an Enterprise edition of JBuilder, but what has been bundled with it has changed over the past year or two. What does "Enterprise" mean to Borland?**

<de la lama>: Well, depending on the context, "Enterprise" means quite a few things. In the case of JBuilder Enterprise Edition, it's directly related to Java 2 Enterprise Edition (J2EE). We, and apparently most developers, believe JBuilder Enterprise Edition is the best development solution to build applications targeting J2EE-compliant application servers.

<sean bates>: **WebGain Studio customers have seen their IDE investment go through two different acquisitions. Since Borland is now the owner of VisualCafé and has accrued some benefit from its acquisition, are they planning to pass this on to WGS customers?**

<de la lama>: Many WebGain customers have already converted to either Together ControlCenter or Borland JBuilder. Migration tools are already available for both of them. This acquisition will simply make it easier for other WebGain customers to migrate to one of these leading application development tools.

<dave weaver>: **What do you see as the migration path for Together users who have adopted ControlCenter as their sole Java IDE? Will it continue as a separate product, or will these users eventually have to switch over to JBuilder?**

<de la lama>: Going forward, Borland plans to invest in both the JBuilder and ControlCenter product lines as each represents a distinct product "personality" (code versus design-centric). JBuilder will not be a substitute for ControlCenter (or vice versa). Therefore, a migration path from ControlCenter is not necessary. However, the company does plan to converge both products onto the same underlying technology platform within the next 12 months and many components used by both product lines will be shared. Examples include UML class diagramming, Web services, and pattern and application server support.

<david lowry>: **What is the planned time frame for integrating the TogetherSoft and JBuilder platforms? What will be the new product and which portion of TogetherSoft will you keep?**

<de la lama>: As mentioned earlier, Borland does plan to converge both products onto the same underlying technology platform within the next 12 months and many components used by both product lines will be shared. But customers won't have to wait that long to benefit from an integrated product. Together JBuilder Edition (TJBE) will be released in the first quarter of 2003. This product delivers the best of TogetherSoft's modeling, audits and metrics, and more, designed to work specifically with Borland's JBuilder.

<noches bellas>: **With your acquisition of TogetherSoft, what will happen now with VisualCafé? Will it get scrapped in favor of JBuilder? If so, will VisualCafé owners get some kind of upgrade deal to JBuilder? Or would you be willing to make VisualCafé open-source software?**

<de la lama>: The WebGain Studio Suite of products was acquired by TogetherSoft and is no longer available for purchase or download. TogetherSoft does continue to offer limited technical support to existing customers with maintenance contracts. WebGain users can already take advantage of migration tools available for both Together ControlCenter and Borland JBuilder. There are currently no plans to make VisualCafé open-source software.

<barry gaunt>: **Now that Borland has acquired TogetherSoft, will we see a Community Edition of Together/J that can actually do something useful?**

<de la lama>: Effective September 30, 2002, TogetherSoft discontinued support for the Together Community Edition product. However, the TogetherSoft Community Web Portal continues to be a key component of TogetherSoft's support for collaboration of our user base. TogetherSoft will continue to foster communication of information through active support of forums; helpful tips and advice for our products and services; and downloads of productivity tools, templates, and interfaces through the Together Community Portal. Customers can enjoy all the features of the Community Edition and much more by purchasing TogetherSoft's Together ControlCenter or Together ControlCenter Solo Edition. *Note:* TogetherJ no longer exists as a product, having been replaced some time ago with Together ControlCenter, now in its sixth generation.

<andre>: **Does Borland plan to fully integrate the functionalities of TCC, JB, and Optimizeit along with increased Web services, XML, and mobile computing support ? If so: How? When?**

<de la lama>: This question goes to the heart of the needs Borland is trying to fill. Developers need more than an IDE – they need a way to easily manage the entire application development life cycle, from requirements, design, coding, and testing to deployment. To answer your question directly, yes, look for Borland to continue to expand its support and integration of the entire application development life cycle in future releases of JBuilder ✎

Remember when coding was easy?

SOFIA does.

SOFIA™ is the Salmon Open Framework for Internet Applications, a new standard in Java development, built by **Salmon LLC**. It is open-source code that you can download for free and put to work today. **SOFIA's** powerful, scalable framework creates an approach to Java Web development that makes programming so easy even a … well, you get the picture. **SOFIA:**

INTEGRATES TOOLS

■ SOFIA empowers J2EE programming with built-in integration of best-of-breed development tools—design tools like **Dreamweaver**, and IDEs like **IntelliJ** and **Eclipse**. SOFIA is anchored by J2EE class and tag libraries that offer more than 40 visual components (Button, Navigation Bar, DataTable) and 20 non-visual ones (DataStore, Internationalization, Task Scheduler).

SIMPLIFIES CODE

■ SOFIA's libraries provide more than **200,000 lines of ready-to-go code**. Based on the Model View Controller design pattern, SOFIA separates Java and HTML/JSP. The standardized approach means **less coding**, easier maintenance and debugging, and a fast learning curve. Instead of tedious, repetitive coding, programmers focus on cost- and time-efficient solutions.

IMPROVES PRODUCTIVITY

■ SOFIA enhances application development and leads to **real cost savings**. Its proven formula has evolved from more than **40 successful projects** led by Salmon LLC, a Java development firm with offices in New York, London and Sydney. This signature framework—battle-tested by clients that include Fortune 1000 companies—sets the new standard for Java development.

SOFIA SETS NEW BENCHMARKS

So, how does SOFIA measure up? We put the SOFIA .Pet to the test against the Sun J2EE Pet Store. The results:

	Sun J2EE Pet Store	SOFIA .Pet
Testing platform	J2EE reference implementation 1.3	Tomcat 4.03
Max throughput	6 pages per second (520,000 hits a day)	30 pages per second (2,600,000 hits a day)
Lines of code	22,221 lines in 250 files	3,563 lines in 50 files

Download SOFIA's open-source code today at salmonllc.com/sofia-jdj and discover why the other frameworks just don't measure up.

salmonLLC

There are myriad approaches to architecting logon and user management in the J2EE environment. This article addresses some alternative J2EE architectures as well as the strategy used by each alternative and the code for implementing each solution. I'll focus on the end user – not the business purpose of many of today's medium- to large-scale Web apps – but my primary focus will be on state-of-the-art solutions.

First, some background information on Struts and MVC frameworks: Struts is on its way to becoming a de facto standard for developing medium- to large-scale Web-based applications on the Java platform. Struts fits nicely into the J2EE technology stack by filling some gaps not addressed by the servlet/JSP standard or the EJB standard. A framework can isolate the developer from the ever-changing J2EE APIs and make it easier to get J2EE applications completed in a shorter time frame. (Although, caveat emptor, Struts is an ever-changing API.) A framework does this by taking care of the low-level plumbing and difficult programmatic challenges involved with building a J2EE application. Basically, a good framework will do the dirty work for you. For more details, see the References section at the end of this article.

Let's begin with the end user at the client in Figure 1 or 2 and work our way toward the server shown in bold outline at the right side of these figures. Figure 1 shows a filters-based design. Filters sit between the end client and the requested resource and are able to intercept the request before the resource sees it. Figure 2 shows another design where front-end processing is incorporated into the application; in the latter case, changes to one component mean changes to the application proper. Struts apps can be built either way.

Filter Strategies

Before launching into filter strategies, here's a brief introduction to filters – a feature introduced in the Servlet 2.3 API. The contents of the filter are written in Java and are thereby flexible and easy to maintain without touching the application code. As shown in Figure 1, filters can be chained and are able to intercept a request before the resource sees it, and can intercept the response on the way back to the client, including generating their own request object for the final resource to see and/or generate their own response to the client.

Filters, like any other Java class, can interact with external resources such as LDAP or database servers. One practical use of filters includes the ability to transform output to suit the presentation needs of the different client devices sending it requests. Whether the app needs to support XML translated to HTML or accept a WAP cell phone that's translated to WML, filters can be used. Filters are pluggable, so you can make changes to them without affecting your application. Another advantage is that they can make decisions about authentication and the like without necessarily burning up CPU cycles running the ServletController, Action, or ActionForm methods of your Struts application.

Filters can be implemented in two ways: the Standard Filter Strategy (see Figure 1) or with the Intercept Filter Design Pattern found in the Struts org.apache.struts.action.RequestProcessor class (see Figure 2). Its processPreprocess() method provides preprocessing and postprocessing of a client Web request (and response). A detailed account of this J2EE pattern is available in *Core J2EE Patterns*, and filters in general in *Professional JSP 2.0* (see References).

The standard filters strategy can be used in front of Struts or any other Web app, while the Struts framework strategy – as its name implies – cannot. In either case, adding the javax.servlet.http.HttpSessionListener interface to the story, as illustrated in Listing 1, helps you deliver login management that runs with browsers that don't have cookies or JavaScript enabled. (Listings 1–3 can be downloaded from www.sys-con.com/java/sourcec.cfm.) Naturally, the latter is not an option when you're using Struts (or other) tags that produce JavaScript that needs to run in the downloaded page. Before the introduction of the HttpSessionListener Interface in the Servlet 2.3 API (J2EE 1.3), you had to write elaborate session managers to keep track of user sessions or to determine when a particular session was invalidated. Now you can use this one minimal piece of code.

A Chain of Pluggable Intercepting Filters

After users are authenticated (Filter2 in Figure 1), but before they and, possibly, their roles are looked up in a DBMS

Windows

Mac OS X

Solaris

Linux

AIX

HP-UX

OS/400

Generic UNIX

InstallShield **MultiPlatform**

MultiPlatform takes flexibility to a new level.

Limitless flexibility for customizing your cross-platform installers.

InstallShield MultiPlatform is the most flexible application installation solution there is. Period. Its extensive customization features and open API let you easily build installers that match your product's branding and meet your every installation requirement, no matter how complex. Whether your software targets Mac OS X, OS/400, Windows, AIX, Solaris, Linux, HP-UX, or any other flavor of UNIX, InstallShield MultiPlatform automatically configures your application to your exact specifications, each and every time. With MultiPlatform's unmatched flexibility and power, it's no wonder major OS vendors like IBM, HP, Sun, PeopleSoft, Siebel, SAS, and J.D. Edwards all standardize on it across their enterprises.

- Unparalleled Flexibility
- Total Platform Support
- Open API
- Extensive Java Support
- Powerful Wizards
- High-Productivity IDE

Experience the unmatched power and flexibility for yourself.

Download a free evaluation copy of InstallShield MultiPlatform today.

www.installshield.com/mpjdj

IBM Business Partner

InstallShield

(Filter4 in Figure 1), the users' sessionID and username are inserted into a Hashtable of active users (filter 3 in Figure 1), unless the users are already there, in which case access to the resources of the app is denied and the users are notified that they are already logged in. The logged-in users are removed from the Hashtable when they log out or are inactive for the duration of the session timeout (typically 30 minutes).

Implementations of HttpSessionListener (see Listing 2) are notified of changes to the list of active sessions in a Web application. To receive notification events, the implementation class must be configured in the deployment descriptor for the Web application. Using this relatively new interface, the onus of keeping track of user sessions and notification is on the container, not code written by the application developer. The session timeout, declared in the Web app's descriptor file (web.xml), is the event used in Listing 2.

The helper class in Listing 3 manages the Hashtable.

To produce the same results in a Struts app as those described above for a filter, the code in Listing 1 is written in a LoginAction or helper class, while Listings 2 and 3 are used unchanged. One final word on filters: just as you must be careful with multiple threads in Java servlets, be careful not to violate any thread-safety practices with filters. The servlet container may send concurrent threads to a single instance of a filter class, and you must ensure that you don't do anything to cause problems between the threads. In other words, there should be no client-specific data stored in instance variables. Local variables are fine, just as they are in Java servlets, because they're stored on the stack rather than the heap.

Authentication and Authorization

Typically, a username and password will be read from a form and compared against server-side values known to your Web app. There are two points of integration: during the login process and when the client requests a resource (usually a URL). At each of these points, the application can defer to Java Authentication and Authorization (JAAS) classes to perform the action. JAAS is a standard extension to the Java 2 SDK v 1.3 and is a part of v 1.4. Traditionally, Java 2 provided code source–based access controls (access controls based on where the code originated from and who signed the code). However, it also lacked the ability to enforce access controls based on who runs the code. JAAS provides a framework that augments the Java 2 security architecture with such support. JAAS authentication is performed in a pluggable fashion that permits Java applications to remain independent from underlying authentication technologies.

Of particular interest to the developer of medium- to large-scale Web apps, moreover, is the direct support for the standard JAAS that Struts 1.1 offers. In Struts 1.1, you can specify security roles on an action-by-action basis as a way to prevent unauthorized users from finding a way to execute an action.

With JAAS, new or updated authentication technologies can be plugged into both Struts and other Web applications without requiring modifications to the application. Applications enable the authentication process by instantiating a LoginContext object, which in turn references a Configuration object to determine the authentication technology, or LoginModule, to be used in performing the authentication. Typical LoginModules may prompt for and verify a username and password or use a smart card reader plugged into a computer's USB port. Others may read and verify a voice or fingerprint sample. Authentication for a particular identity can be provided by a Netware server, an Oracle database, LDAP, Windows .NET, a Unix server, or a simple application server–specific XML file.

Permissions are the heart of authorization; they control access to resources. However, the JAAS permissions are built on top of the existing Java security model. This model is good for controlling access to resources like sockets and files, but has no concept of URLs. Thus, to apply JAAS to a Web application, a new permission class must be created.

If your authentication mechanism changes (say from a database to LDAP) you can change it without modifying your business code. With some servers, simply change an XML file to point to your new JAAS/Authentication module and restart. Depending on your application, you can let the application vender provide a prepackaged JAAS infrastructure where you specify the details of authentication and authorization declaratively using configuration files.

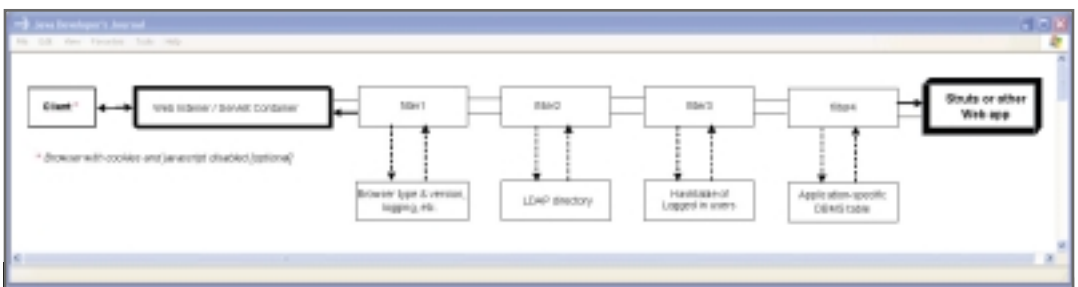


FIGURE 1 Filter chain–based login/user management systems

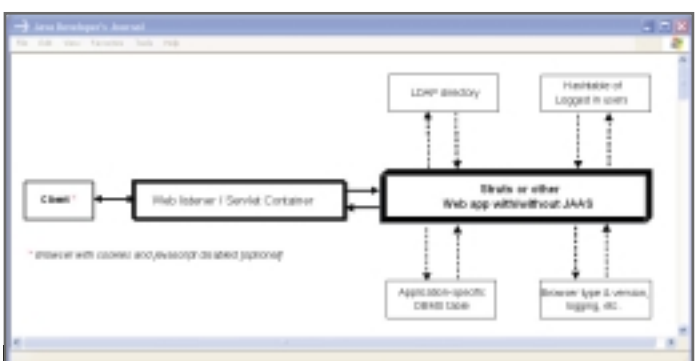


FIGURE 2 Struts and (JAAS)-based login/user management systems

The programmatic security described earlier is useful when declarative security alone is not sufficient to express the security model of your application. The security requirements of your application can also be declared in such a way that security considerations can be satisfied during application configuration. The declarative security mechanisms used in an application are expressed in a declarative syntax in a document called the deployment descriptor (web.xml). An application deployer then employs container-specific tools (or configuration files directly) to map the application requirements that are in the deployment descriptor to security mechanisms that are implemented by J2EE containers.

Last, while beyond the scope of this article, Single Sign On (SSO) is a small step away once you have JAAS and LDAP in place.

Of course, you don't have to use JAAS at all. As Figure 2 suggests, you can simply hand code "old-fashioned" lookups to LDAP and/or database servers. Or, in a Struts environment, you can provide a comma-delimited list of security-role names allowed to request a particular action. These names are then available programmatically with the ActionConfig .getRolesNames() method.

Give your J2EE applications lightspeed performance.

To excel in today's business environment, your J2EE applications need to scream like a bat out of hell. With heavy traffic bottlenecks and crawling end user response times, you're total roadkill. Proactive detection of application performance problems is crucial to rapid resolution, and to taking the detour around a crisis up ahead.

Precise/Indepth for J2EE correlates web, J2EE and database server performance to get to the root cause of performance degradation, from URL to SQL and beyond™.

As Precise/Indepth for J2EE anticipates performance degradation, it instantly notifies your top mechanics for analysis and tuning deep within the middle tier of your web infrastructure and provides automatic drill-down analysis and recommendations. This translates into streamlined J2EE web applications and lightning fast response times.

Turn up the speed limit for your J2EE applications. Talk to your Precise account representative today at 1.800.310.4777, or visit **www.precise.com/jdj** to download a free white paper on J2EE performance management and to register for an upcoming Webinar on J2EE application performance.

Precise

Performance is Our Business

Substituting ADSI and ActiveX

As a Java developer, you may sometimes be able to use some of the functionality found in ubiquitous Microsoft network technology; it can occasionally provide a ready-made and inexpensive solution, particularly in a low-budget intranet environment. First, there's Microsoft's Active Directory Service Interfaces, or ADSI, a programmatic interface to Active Directory domain controllers, as well as to Windows NT and NetWare 3, 4, and later versions. What's of interest here is that almost all access to Active Directory takes place with LDAP. For the Java developer, ADSI offers almost the full range of access to Active Directory from your scripts written in Microsoft's proprietary Windows-limited Java 2.0 SDK, called J/Direct. But the litigious debate between Microsoft and Sun Microsystems will probably limit your interest in using J/Direct. However, the good news is that you have always been able to access a subset of Microsoft's "LDAP server" from code written with Sun's JDK.

As an aside, there's the possibility of getting a user's Windows 2000 public credential using an ActiveX control built into Microsoft's IE. Here's all the code that you need:

```
var WinNet = new ActiveXObject("WScript.Network");
var userName = WinNet.UserName;
```

However, client-side authentication is problematic. A simple way to defeat this ActiveX-based approach is to "view source" in your browser, save it to a text file, and modify the JavaScript to always return the desired user name. However, there's sometimes a simple way around this shortcoming: simply disable access to the browser's menu.

Monitor and Control

You may need to monitor and control incoming requests for Web resources, whether or not you choose to use filters – blocking an authorized user's attempt to submit a duplicate request after he or she has unintentionally pressed a Submit button twice, clicked the Back button and resubmitted a form, or tried to access certain views out of order by returning to previously Bookmarked pages. You could remedy these situations on your own by coding J2EE's Front Controller pattern, Command and Control strategy or, more efficiently, by using an encapsulation of everything you need in two methods of Strut's org.apache.struts.action.Action class – isTokenValid() and saveToken() – as shown in the following snippet:

```
if (isTokenValid(request, true)) {
// your code here
return mapping.findForward(Messages.success);
}
else{
saveToken(request);
return mapping.findForward(Messages.other)
}
```

When this code is run, a unique token, generated using the session ID and the current time, is stored as an attribute in the session, and, in parallel, the JSP responsible for generating the HTML creates a parameter in the request as a hidden form field when you use the Struts <html:form> tag.

The isTokenValid() method determines if there's a token stored in the user's current session, and the value submitted as a request parameter with this action matches it. This method returns false under any of the following circumstances:

- No session associated with this request.
- No token saved in the session.
- No token included as a request parameter.
- The included token value does not match the token in the user's session.

If there's a match, we're certain the request submission is not a duplicate. If the tokens don't match, the request will go through the else block where a new token will be saved in the user's current session, creating a new session if necessary.

In your rush to exploit these elegant solutions, don't forget to consider earlier, sometimes much-simpler techniques that we've "always" had available. For example:

```
    if (username==null && password==null)
    {

((HttpServletResponse)response).sendRedirect("/Login.jsp")
;
    }
```

can eliminate the bookmark problem. And, setting a flag and then disabling a button after first use can eliminate the problem caused by pressing a Submit button twice.

Validation of User Inputs

Finally, no article on user behavior would be complete without at least a brief mention of validating user inputs. Validation is another one of those "growth industries" from which you can pick and choose from a number of possible solutions – client and server side. While a regular user of the former, I'll limit myself here to the subject of pattern matching on the server side. In the past, to pattern match using the Java programming language required the use of the StringTokenizer class with many charAt substring methods. This often led to complex or messy code. But, J2SE version 1.4 contains a new package called java.util.regex, enabling the use of regular expressions. The Apache Software Foundation now provides org.apache.regexp.RE, an efficient lightweight regular expression evaluator/matcher class. It enables sophisticated matching of strings against a pattern and extraction of parts of the match. Then there's what I'll call the "industrial-strength validation alternative" provided for Struts apps, the Struts Validation framework. With it, you can wind up writing a lot of boilerplate XML for every form and for every field of every form. On the other hand, the validator does reduce the amount of validation logic you have to write.

Conclusion

While you have a great many state-of-the-art bells and whistles available to you for consideration in your next medium- to large-scale Web app, you also have some tried, true, and frequently overlooked resources sitting unused in your browsers and at your servers. While I've concentrated on monitoring and controlling the end user, the same philosophy – of always looking for a simpler route – should also be applied to any design aspects of your app.

References

- Turner, J., and Bedell, K. (2002). *Struts Kick Start*. Sams .
- *Struts tutorial:* http://jakarta.apache.org/struts/doc-1.0.2/userGuide/index.html
- Alur, D., et al. (2001). *Core J2EE Patterns*. Prentice Hall.
- *Struts 1.1 API:* http://jakarta.apache.org/struts/api/index.html
- *JAAS in Struts:* www.mooreds.com/jaas.html
- *JAAS tutorial:* http://java.sun.com/products/jaas/index-10.html
- Li, S., et al, (2003). *Professional JSP 2.0*. Wrox Press.

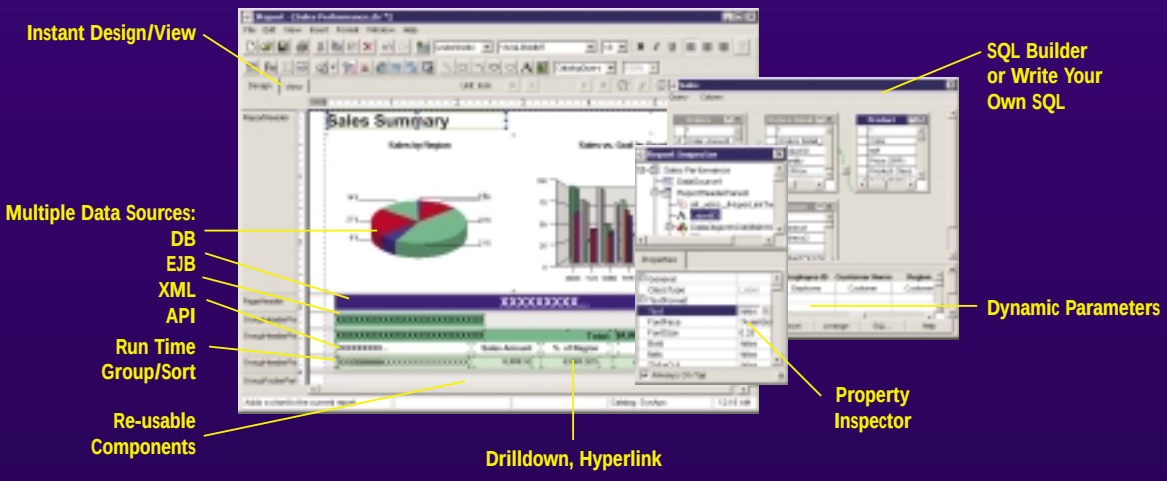
Author Bio

Marcia Gulesian is a senior software engineer and health information analyst at Children's Hospital Boston. She is the author of more than 100 technical articles on distributed applications and the systems that support them.

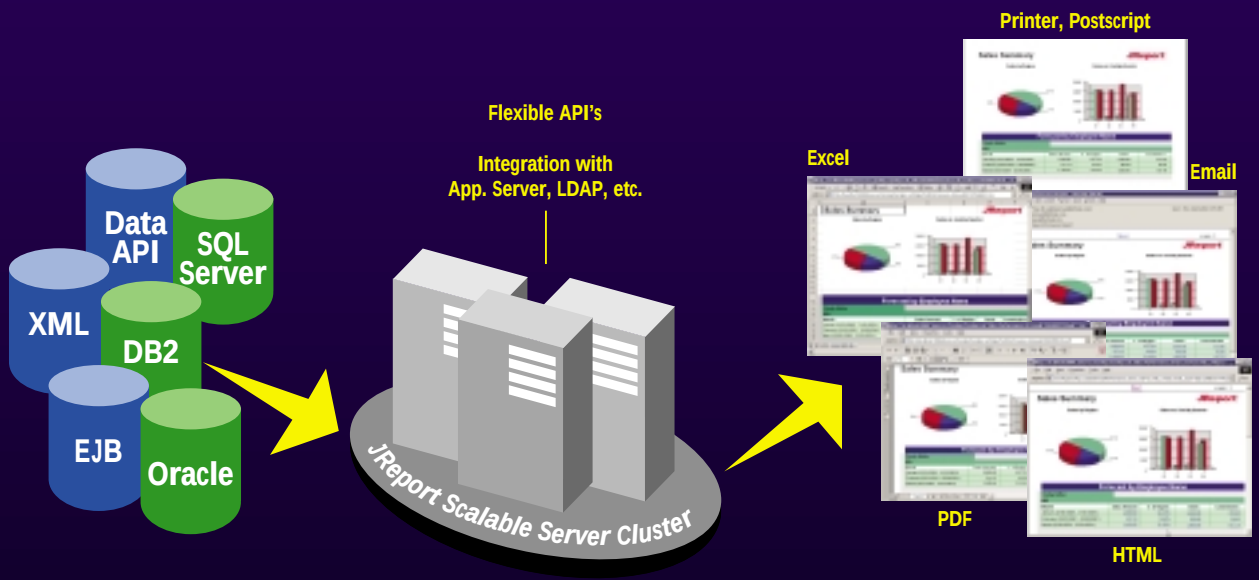
mg@theworld.com

VISIT US AT WEB SERVICES EDGE BOOTH #514

DESIGN ONCE...



REPORT ANYWHERE.



JREPORT™

JReport lets you take your reports anywhere you want. Imagine creating reports that pull together data from virtually anywhere, arranging them any way you wish, and delivering them precisely – whether in pure HTML, PDF, Excel, XML, JSP, email, or your network printer. Imagine having ad hoc reporting ability to create or modify reports on the fly, right from the end user's browser.

And all this is built on 100% J2EE architecture, to provide secure, reliable, scalable performance and easy integration with your enterprise systems. You can count on JReport: any report, any format … anywhere.

JINFONET SOFTWARE

FREE DOWNLOAD! VISIT www.jinfonet.com/j3.htm OR CALL 301-838-5560

More Than Marketing

by Steven Berkowitz

On November 7, 2002, Chutney Technologies sponsored a small get-together at New York City's Marriott Financial Center. When Alan forwarded the invite to me, my first thought was, "Goodie. Nothing about Web services."

As it turns out, that wasn't entirely true, but Web services was not the focus. They just came up as incidental to everything else.

The day started with a presentation by Charles Francois, Sun's chief architect for Sun ONE. Francois talked about the Sun ONE set of products and was followed by Chris Riley, senior technology evangelist from Cape Clear, who spoke about their own CapeConnect software. These were straight marketing presentations. You may well have uses for these products, in which case you should visit their respective Web sites to learn more since such presentations don't leave me with much of my own to say.

The third presentation was given by Dr. Anindya Datta, cofounder and CEO of Chutney Technologies. I was a little concerned that this was going to be another hour of mere marketing. Had that been the case, you wouldn't be reading this now. Yes, Chutney had a product to sell (an out-of-process object storage solution called Apptimizer) and, of course, they would love for us all to buy it. But rather than simply tell us about the product, Dr. Datta presented an in-depth explanation of the problem Apptimizer solves. The slides were largely about the vicissitudes of object creation, object destruction, and garbage collection. Maybe it was his command of the subject matter, maybe his quiet passion for the topic, but Dr. Datta presented a compelling case for external object storage.

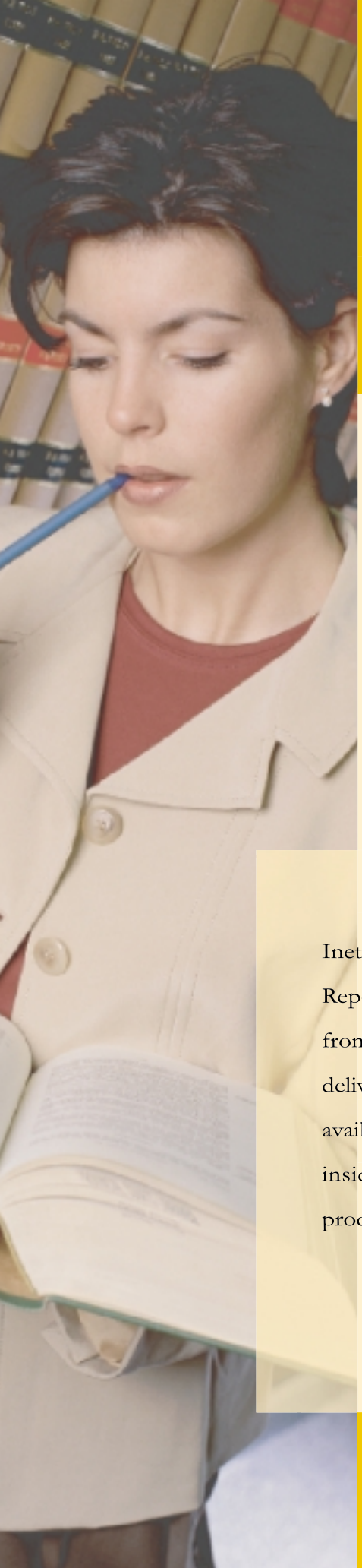
There is a lesson here for marketers. Don't just tell me about your product. Don't just tell me about people who have used it successfully. Show me a problem and then show me how to solve it with your product. Dr. Datta didn't mention his product by name until slide 42 of a 54-slide presentation. Yet, as a marketing tool, his was the most effective of the three presentations.

After lunch, Bijesh Jacob, senior architect at Marsh, Inc., told the tale of how they implemented the portal at Marsh.com. Something fascinating came out during his talk: when trying to scale the portal, Marsh's J2EE server crumbled under the heavy load. Jacob couldn't tell us which server since Marsh had signed a nondisclosure agreement with the vendor. Hey, vendor, whoever you are, shame on you.

After Jacob's presentation there was a panel discussion consisting of Jacob, Riley, Dr. Datta, and Edgar Holcomb from JP Morgan. The real meat of this discussion revolved around Morgan's experiences with implementing their own portal.

A servlet-based application running on WebLogic, Morgan's portal is an example of how Web services are being used right now. This project is serving as Morgan's Web services proof of concept. The business units using the portal are free to write their portlets in whatever language(s) they wish as long as they provide clear SOAP interfaces. However, Holcomb said the portal developers worked very closely with the business units on this project to make sure everything worked the way it had to.

Okay, think about that for a minute. Web services promises interoperability between applications. Morgan acknowledges, even embraces this, in theory. However, in their first actual implementation of Web services, they refused to take

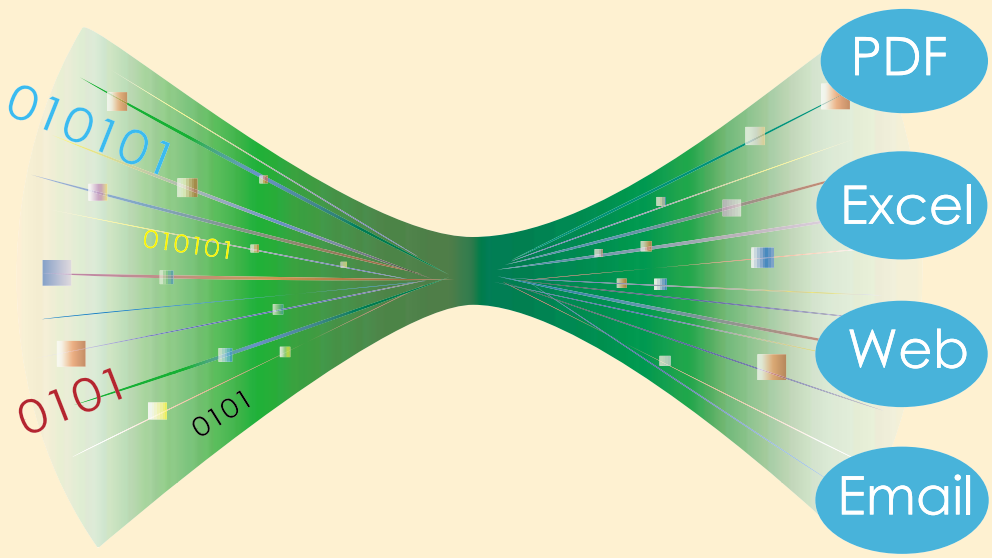


My Enterprise Reporting Solution Must:

(1) be built on open-standards

(2) support end-user ad-hoc queries on the web

(3) have reusable logic/ components



STYLE REPORT

InetSoft provides open standards based, innovative component technologies. Style Report is a 100% Java, integration oriented retrieval solution that aggregates data from any source into intelligent, actionable, decision making information. Flexible delivery channels, such as Web, email, PDF, and Excel ensure that information is available where and when it's needed. Zero client Ad-Hoc web reporting is provided inside a comprehensive framework that maximizes end user's self-service productivity. Style Report instantly becomes a seamless part of any infrastructure.

STYLE REPORT

JDJ special http://www.inetsoft.com/jdj

www.inetsoft.com

InetSoft

the hype on faith. While the business units are said to be free to use whatever technologies they want, the reality was that they were hand-held through this process by the portal group – a cautious and rational approach. They see the promise and want to make sure the technologies can live up to it.

Holcomb says that they are very happy with how things are working and he sees more such projects in the future. As they move forward, the business units will implement things as they see fit. This will be a project to keep an eye on, perhaps even a barometer of the future of Java-based Web services.

Once again, some of the best information presented at this seminar was not on the menu. A little digging turned up some interesting facts about some real-world projects. The advice I gave in "Good New for the Java Universe" (***JDJ***, Vol. 7, issue 11) still holds. Go. Ask. Listen. Learn.

Atlanta Java Software Symposium

by Joey Gibson

I arrived at the Norcross Marriott (which is about 20 yards as the crow flies from my office at BravePoint) at 12:15 on Friday, November 15, the first day of the symposium.

The symposium in question is the Atlanta Java Software Symposium, organized by an outfit out of Colorado called The Complete Programmer Network. They've been putting on a series of these symposia across the country, with Atlanta being the final stop of the year.

Seated at the registration desk was symposium organizer Jay Zimmerman, who greeted me warmly as I introduced myself. I was presented with a conference folder containing an updated schedule, session evaluation forms, and most important, a CD-ROM containing all presentations from all presenters for the entire show in PDF format. This is a very nice touch that more conferences should emulate.

I briefly spoke to Jay, who told me that their method of getting the word out about their symposia is to provide, gratis, big-name speakers at local Java user group meetings who will plug the upcoming shows. Speaking at the Atlanta Java User Group back in September was James Duncan Davidson, creator of Apache Tomcat and Ant.

Sporting an impressive list of speakers including the aforementioned James Duncan Davidson, Erik Hatcher, Grant Holland, Jason Hunter, and Bruce Tate, this symposium proved to be a fun and informational experience. With attendance limited to just 200, there was plenty of room to move around and relax during the sessions. I must admit it seemed a bit odd at first for a conference to run Friday through Sunday, but it hit me how useful this would be for local companies. Since these symposia are being done in several cities, local companies could send entire teams and not lose several man-weeks of productivity. This is by design. And with the cost of attendance just $695 (with group discounts) including five meals, this thing is a steal.

The motto of this symposium series is "No Fluff, Just Stuff" and it absolutely lived up to it.

I've been to JavaOne several times and have walked out of sessions within seconds because they were nothing more than marketing pitches. This didn't happen a single time during this symposium. With the slight exception of the opening night's keynote from Sun (which I'll get to shortly), almost all the material covered was applicable for any product from open source to proprietary, and was free of marketroid-speak. It was about techniques, tips and tricks, and how to best get the job done. No fluff, just stuff.

Most of the sessions were an hour and a half in length, but on Saturday some of them were three hours. Topics included Ant (a personal favorite) and friends including XDoclet and JUnit, Struts, JMS, design patterns, anti patterns, and JDO.

Sessions ranged from introductory to advanced and there were even a few you wouldn't expect at a Java symposium, such as Ruby (another personal favorite) and a session extolling the virtues of Mac OS X.

Opening night featured Daniel Templeton from Sun delivering the keynote address. He gave a sort of roadmap of where Java is going. He spent quite a bit of time talking about Sun's view of Web services and JAX-RPC. It was an interesting talk, even if it did border on marketing a few times. He was heavily pushing JAX-RPC as opposed to other Web services toolkits, but that's to be expected. Oddly, he also talked about using Jini for Web services. Technically speaking, this does fit the Web services definition, but it takes out the interop piece since Jini is Java-only. He also discussed how in the future the J2ME platform would have SOAP access, an interesting thing to say the least. One amusing comment from Templeton (while discussing J2EE 1.4) as he took a friendly swipe at IBM was "IBM asked Sun to delay the release of J2EE 1.4 because WebSphere was so far behind. We politely declined." This was greeted with chuckles from the audience. He also pushed Sun ONE App Server for J2EE saying that it is definitely not iPlanet: "We buried that thing and danced on its grave." He followed this up with "Sun has a history of killing application servers," a reference to Sun's purchase and subsequent offing of NetDynamics, which was, again, met with laughter.

The keynote was followed up by an expert panel round-table discussion with several of the presenters. Jason Hunter, of servlets fame, was one of those. He spoke of how "JSP was created for marketing so Sun could sell something competing with ASP," and how he prefers the Tea (http://opensource.go.com) technology to JSP. (Servlets.com is built using Tea.) I found this interesting and decided to look into Tea some more.

As for the technical sessions, the content was excellent. One of the presenters, Sue Spielman, was stuck in Denver so Erik Hatcher stepped up to the plate to take over her sessions. He was already scheduled to present three or four sessions, so he was certainly the hardest working man that weekend! Dave Thomas was also unable to attend, so Glenn Vanderburg filled in for him. I attended sessions on XDoclet, anti patterns, JDO, Castor, Ruby, EJB, JAAS, and a few others. I started to take notes, but not only did I have the CD-ROM with all the presentations, there were printouts available at the beginning of each session, so I didn't have to write everything down. I could just make annotations as necessary.

What's the takeaway point from all of this? These symposia are extremely affordable, especially if a company were to send a group of employees, and the content is exceptional, making for a great value. I couldn't have been more pleased with how it went. I've been raving about it to colleagues and friends and have been putting to good use several of the things I learned there. I can't wait until next year! I would suggest to anyone who wants to attend a conference next year to see if one of the Complete Programmer Network's symposia is coming to your town. Details about upcoming symposia can be found at www.nofluffjuststuff.com. It will be well worth it.

Author Bios

Steven Berkowitz has done development and project management for Fortune 100 companies, startups, and nonprofit organizations. He is the founder of techniCrafters, which provides Web development services to small businesses and municipalities.

Joey Gibson is a senior consultant and instructor for BravePoint, a consulting company in Atlanta, GA. He is the coauthor of Ant Developer's Handbook published by SAMS.

sjb47@yahoo.com & joey@joeygibson.com

from email to secure credit card transactions, only one component suite does it all!

Microsoft .NET
Microsoft Windows
Pocket PC
Windows CE
.NET Compact Framework
ActiveX/COM/ASP
Cross-Platform
C++Classes
Borland VCL/CLX
Pure Java Beans
Mac OS X
Solaris
Linux
100% Managed .NET Components

Best-Selling Suite of Internet Components

A Comprehensive, No-Compromise Solution

Since 1995 - Excellent 7+ Year Track Record
Professionally Supported
Market-Tested and Market-Proven
Razor-Sharp Performance
Follows Exact RFC Specifications

TCP/IP

IP*Works!

Truly comprehensive suite of components for Internet communications. More than 30 components cover all major Internet Protocols and more!

SMTP POP IMAP NNTP MX HTMLMAIL

FTP HTTP SSL XML SOAP UPLOAD

S/MIME

IP*Works! S/MIME

Components that implement the S/MIME standard for digital security. Key for complying with new Federal Regulations such as HIPAA.

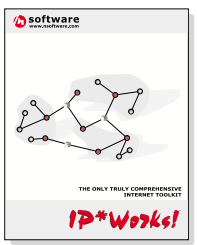
SSL

IP*Works! SSL

Secure communication channels through SSL security and digital certificates. Complete with digital certificate management components.

SNMP LDAP WHOIS RAS PING TRACERT

REXEC RSHELL TELNET RCP TFTP TIME



IM

IP*Works! IM

Suite of Instant Messaging components based on major real time messaging standards. Includes components for AOL, MSN, and Jabber (XML).

ZIP

IP*Works! Zip

Suite of easy to use, fast, effective components for compression/decompression. Supports ZIP, JAR, GZIP, TAR, and streaming operations.

CERTMGR SSL MIME S/MIME

TCP UDP IM NETDIAL ZIP MULTICAST

CC

IP*Works! CC

Real-time secure validation, verification, and authorization of credit cards. Includes components for VISA IPGS and 3D Secure (Verified by Visa).

Certified By Visa International for both IPGS and 3D Secure (Verified By Visa) Compliance

software

JASON BELL J2SE EDITOR

Can the API Docs Be Improved?

The Java Dudes cartoon on the back page of ***JDJ*** has boosted my reputation as someone who likes the API documentation for the core Java language. It's easy to navigate, it's quick, and it answers some of those common Java-related questions. There are a couple of questions that are constantly on my mind. First, with such a rich resource of information, why do programmers (of all abilities) whom I have contact with fail to look at the API docs in the first place?

One theory is that there's a lack of detail about using some of the methods listed. Now, I know of sites like Java Almanac (www.javaalmanac.com) that provide good examples on how certain methods are used, but I do think these should be woven into the general API docs. Beginners would benefit from having a resource on their own system that would also provide general examples on how that class or method should be used without having to sift through the example code (can you remember when you last looked at it, I can't!).

There are small snippets of examples within the main class explanation; my goal would be to have a small code segment for the methods as well as a quick indication that I'm going in the right direction. The more that's added to the API as time goes on, the more that'll have to be documented. Obviously, there's a whole book-writing segment of the community who makes a living from bundling these examples into API reference books. Patrick Chan (and his team) has done an excellent service for the Java community with the *Java Developer's Almanac* and has obviously spent a lot of time looking at all the classes (hey, if you want music MIDI class information, it's in there). The same is true for David Flanagan, who wrote the Java Nutshell series for O'Reilly; he even wrote *Java Examples in a Nutshell* as the API reference was so large it was pushing examples out.

Apart from increasing the size of the download of the documentation, I don't see why Sun can't improve the example usage of methods with all the APIs regardless of whether it's J2SE, J2EE, or J2ME. The API docs should be the first point of reference for the programmer to help solve the problems. The more people I talk to, the more I'm reduced to pointing to the API docs (mainly on IRC). Now it's either down to plain laziness or the information that's presented is not up to the job. I agree that there are a number of Web sites with more information, but it becomes a major task to search these sites and get the required information. I'm finding that students in teaching establishments tend to ask questions without consulting these sites.

If anyone from Sun Microsystems is reading this, their blood pressure is probably rising on the simple issue of time management and what to include and what not to include, if any of my small wishes come true. What we could do is pick a couple of methods and write an easy example. These would then be checked and verified by Sun (because we don't want anything going into the API docs) and then it could be released. Now I do know that this means changing the JavaDoc statements within the actual class code, but most people install Java with src.zip installed, so I think it's worth thinking about.

I've looked at many open-source projects and documentation is the area where most things fall apart. We have to look at the whole picture regardless of how big the application is; even if it's a demo I want to know how it works. The SourceForge projects I'm involved in are pretty weak on documentation and I try to rally the troops to properly write about what they're doing and thinking within their code. It's like trying to land a plane and asking, "What does that dial over there mean?" "Well, Jase, it doesn't say anything, apart from the fact that it's being written at the moment." We can do better; we can do better.

jasonbell@sys-con.com

AUTHOR BIO

Jason Bell is a programmer and chief technical officer for a B2B Web portal in York, England. He has been involved in numerous Web projects over the past five years, the last two of which have been servlet-based.

J2SE INDEX

DARE TO COMPARE?

RIP OUT THIS FEATURE LIST AND SEE HOW YOUR SERVER STACKS UP AGAINST MACROMEDIA® JRUN™ 4 SERVER

NEW AND ENHANCED FEATURES OF JRUN 4:	JRUN 4	
Certified J2EE 1.3 Compatible	✓	
High performance web container with JSP 1.2 and servlet 2.3 support	✓	
Advanced EJB 2.0 support including local interfaces, message-driven beans, EJB-QL, and CMP 2.0	✓	
Additional Java® 2 APIs -- JMS 1.0.2, JTA 1.0, JAAS 1.0, JCA 1.0, JAXP 1.1,JavaMail 1.1, JDBC 2.0, JNDI 1.2, RMI/IIOP 1.0	✓	
Support for XML, SOAP, WSDL, and UDDI for web services	✓	
Built-in production quality HTTP server	✓	
Hot modification and auto deployment of applications	✓	
Integrated XDoclet support for simplified component deployment	✓	
Built-in Macromedia® Flash® MX Remoting services for high impact user interfaces	✓	
Type IV JDBC drivers included for Oracle®, MS SQL Server, IBM® DB2, Sybase®, and Informix®	✓	
Highly customizable and extensible JMX-based service-based architecture	✓	
JMX-enabled web-based management console	✓	
Advanced multi-tier server clustering enabled by Jini® technology.	✓	
Leading OS platforms, including Unix, Linux®, and Windows®	✓	
FULL-FEATURED PRODUCTION DEPLOYMENT	**$899/CPU**	

Java Compatible™ Enterprise Edition

We've packed JRun 4 with features to make it faster, easier, or more affordable than any other J2EE server you can find. Don't just trust what you read, try it out yourself. You'll see why over 10,000 leading organizations deploy their J2EE applications on JRun.

Our FREE non-expiring developer version will get you started. Download JRun 4 today for FREE at:

www.macromedia.com/go/jrun4jdj

Go ahead....we dare you.

macromedia® JRUN™4

Java Data Object

Works transparently on any data store

WRITTEN BY
TERESA LAU

Java Data Object (JDO) is a standard API generically used to store, retrieve, and query user-written object classes to and from a data store.

What makes JDO stand out among other persistence options is that it's easy to use and flexible.

JDO provides transparent persistence so it's easy for developers to persist objects without doing any extra work. The tedious and routine persistence work is offloaded to the JDO vendor, leaving developers with time to concentrate on the business logic. In addition, JDO is flexible because it can work on any data store. While JDBC provides persistence only for relational databases, JDO is more generic, providing persistence for any data store, for example, relational databases, files, XML and object databases, etc., making applications very portable.

Overview

Metadata and Enhancer

In JDO, any object class to be persisted needs to be PersistenceCapable, while any class that references a persistence-capable object needs to be PersistenceAware. The good news is that with JDO transparent persistence, you don't have to program your class to implement PersistenceCapable or PersistenceAware. Just write your object class as usual, and the JDO vendor implementation will provide an Enhancer that will make your object class PersistenceCapable based on the metadata you provide. The only extra work you need to do is to write a metadata file in XML for your object. Listing 1 shows the metadata that I'll be using later in my code example. (Listings 1–7 and the code examples for this article can be downloaded from www.sys-con.com/java/sourcec.cfm.)

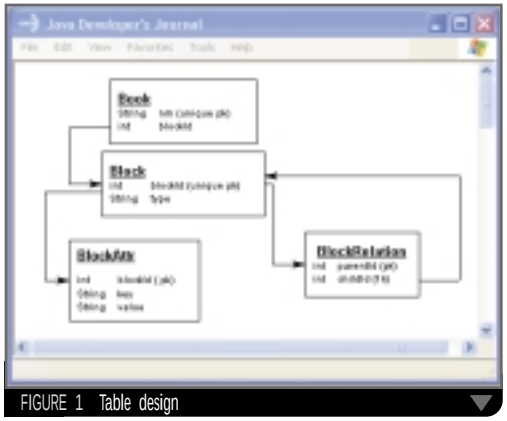


FIGURE 1 Table design

The metadata is usually short and not hard to write because by default, JDO already derives a lot of information from the object class. Specify information in the metadata only when:

- You need to override JDO default behavior, e.g., making a field nonpersistent even though it's not transient.
- There's information JDO can't derive from the class definition, e.g., which field is the primary key or what kind of object is inside a Collection.

PersistenceManager

With object classes enhanced, you can then persist the object by using a PersistenceManager. To get a PersistenceManager, first specify a Property object, which usually contains:

- Data store connectivity information
- JDO vendor class name
- Default settings for the PersistenceManager

Lines 2–3 in Listing 3 show how you can get a PersistenceManager from a JDOPersistenceManagerFactory by specifying a Property object. Once you have a PersistenceManager, you can use it to add, update, delete, and query objects (which I'll discuss in the next section). When you're done, close the PersistenceManager to free up its resources at the end.

Listing 3 shows code fragments of how you can persist and query objects using JDO. With a PersistenceManager pm, you can add a new object to a data store by makePersistent (Lines 6–8). An object only needs to be made persistent the first time it's known; once an object is already makePersistent, you can update the object directly by referencing its fields. All changes to that object will be saved to persistence storage when the transaction commits. If you don't like those changes, roll back to undo them (Lines 15–17). Similarly, you can delete an object with deletePersistent (Line 26).

To access objects in the data store, iterate through an Extent, which is the logical representation of all persistent instances of a given persistence-capable class (Lines 12–15).

However, if you want to be more selective and get only a subset of instances of a given class, create a query. To do this, pass a Candidate object and a Filter to the method newQuery. The Candidate object is a set of objects to select an instance from; it can be a collection of objects or an extent. The filter is a string written in JDO Query Language (JDOQL). Once you create the query, execute it and get back a collection of instances that match (Lines 22–26). JDOQL is the query language for JDO; it's somewhat similar to SQL but has a Java syntax. The example here is a simple one; with JDOQL, your Filter string can be much more sophisticated. In addition, if you declare parameters to act as placeholders in the filter string, you can write a single query and then execute it multiple times, supplying new values each time. There's a lot more to JDOQL that you can read up on; please refer to the links in the Resources section.

A unique thing about JDO's query capability is that once you get an object, you can navigate to any other object referenced by that object. Frequently, all

PROPERTIES FOR JDO

Listing 2 provides the Property file that I'll use later. I'm using a relational data store and Lines 1–4 contain JDBC connectivity information. Line 6 contains the name of the JDO vendor class I'm using. Lines 8–10 are the default settings I want for the PersistenceManager. It specifies that I'm using optimistic transaction, and that values in the cache should be restored on a transaction rollback, and should not be retained on a commit. There are many more details on how you can use different options for transactions; read the JDO API to find out what they all mean and when to use them.

WebAppCabaret™

J2EE Web Hosting

www.webappcabaret.com

Quality Web Hosting at a reasonable price...

<JAVA WEB HOSTING AND OUTSOURCING>

You have developed the coolest mission-critical application. Now you need to deploy it.

Outsource your hosting and infrastructure requirements with WebAppCabaret so you can save time and money and concentrate on other important things. WebAppCabaret is the leading **JAVA J2EE** Web Hosting Service Provider. From shared hosting to complex multi-dedicated server hosting, WebAppCabaret has the right solution for you. **30 Day Money Back Guarantee.** WebAppCabaret offers the latest Standards based Servlet containers, EJB servers, and JVMs. We provide options such as e-Commerce, **EJB 2.x**, Failover, and Clustering. Our **Tier 1** Data Center ensures the best in availability and performance.

OUTSOURCNG:

Do you really need an IT department for your web applications, mail systems, and data backups when we can perform the same functions more efficiently at a fraction of the cost - with the right technical expertise and redundant hosting facilities.

J2EE HOSTING:

Below is a partial price list of our standard hosting plans. (**Reseller accounts also available**). For more details and for $25 off the total price of your order please log on to **http://www.webappcabaret.com/jdj.jsp**

Features	Basic	Professional	Enterprise	Dedicated
Monthly Cost	**$9**	**$17**	**$34**	**$191**
Servlet 2.3	✓	✓	✓	✓
JSP 1.2	✓	✓	✓	✓
EJB 1.1	✓	✓	✓	✓
EJB 2.x			✓	✓
Private JVM	✓	✓	✓	✓
Database	✓	✓	✓	✓
e-Commerce		✓	✓	✓
Tier 1 Center	✓	✓	✓	✓
Accounts/Server	100	100	25	1
Diskspace	30MB	200MB	900MB	40GB
Bandwidth/Month	3GB	10GB	15GB	35GB
Backup	✓	✓	✓	✓
Domains	1	2	5	Unlimited
Email Aliases	2	20	100	Unlimited
Servlet Contexts	1	1	10	Unlimited
Control Panel	✓	✓	✓	✓
FTP	✓	✓	✓	✓
Telnet/SSH		✓	✓	✓
Web Mail	✓	✓	✓	✓
Web Stats		✓	✓	✓
Perl/PHP		✓	✓	✓
Failover			$27/month	$25/month
Engine Choices	✓	✓	✓	✓
WAR/EAR	✓	✓	✓	✓
Tomcat	3.x-4.0.3	3.x-4.0.3	3.x-4.1.x	3.x-4.1.x
JBoss	2.4.1	2.4.1	-3.x	-3.x
Cocoon	1.8.x	2.x	2.x	2.x
RMI	✓	✓	✓	✓

Prices, Plans, and Terms subject to change without notice. Please log on to our website for the latest Prices and Terms.

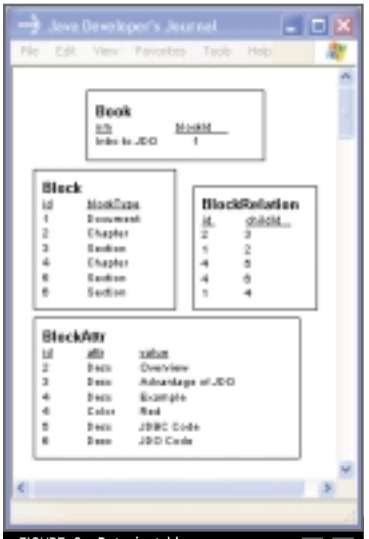


FIGURE 2 Data in table

FIGURE 3 JDO implementation test result

you need is to get a starting point object, and you can already get to any object related to it without having to run another query.

An Object Persistence Example

To find out if JDO is as good as promised, I'll write some code using JDO and JDBC to persist a Book object that I created (see Listing 4). This Book object contains a name and a Block object. To make things interesting, a Book has a constraint that each book is uniquely defined by its name, meaning that you're not allowed to add two books with the same name.

A Block is a building block for a Book. It can be of type Document, Chapter, or Section. The root Block is of type Document and can contain any number of Chapter Blocks. Each Chapter Block can also contain any number of Section Blocks, so there's a recursive relationship here for Blocks. Within each Block, there's a HashMap that may store any number of attribute value pairs for that Block.

Listing 5 shows a test Book I created for my example. This Book contains two chapters: Chapter 1 has one section and Chapter 2, two. In particular, Chapter 2 has an attribute Color=Red.

Using this Book class, I want to implement some common persistence features as follows:

- ***Add:*** See if I can successfully add two books to a data store, and that when I add a third book with the same name, an exception is thrown because the integrity constraint is violated for the unique book name.
- ***Update:*** See if I can update a Book by adding an attribute "Comment" to its root Block. When I commit, the change should be saved, and if I roll back, the change should be discarded.
- ***Delete:*** See if I can look up a book by a query and delete it from the data store.

Without JDO, my usual way to implement this would be to design relational database tables to store all the data contained in a Book, then use SQL and JDBC to store/retrieve that data to/from the tables. Due to space constraints, I won't show you my JDBC implementation here, but you can download it from the ***JDJ*** Web site if you're interested. Note that to implement the above features in JDBC/SQL, I have to write quite a lot of code (480 lines!). What I'm going to show you now is a much shorter way to address the same problem using JDO.

Persisting a Book Object Using JDO

To persist a Book object in JDO, although I'm using exactly the same object class as I would use if I implemented this in JDBC, the ID field in the Block object is now unnecessary. If I implement this in JDBC, the ID field would be needed to internally reference a different Block from the database table. However, using JDO, I don't have to worry about populating this field since JDO will handle that internally.

To persist my Book object, I create metadata for both a Book and a Block (see Listing 1). In the metadata for Block, I specify that the object in the Collection children is of type Block (Lines 10–11), while the key and value for HashMap attributes are of type String (Lines 12–14). Also, since the ID field is not really needed for the Block object, I specify in the metadata that there's no need to persist it (Line 8). In the metadata for Book, I specify that nm is the primary key of Book (Line 5), and that the Book object should use my user-defined Application Identity BookKey as the object identity class (Line 4). The code for the class BookKey can be found in Listing 6.

In this example, the JDO Vendor implementation I use is Kodo JDO (which uses a relational database). There are many JDO implementations in the market; you can choose to use any of them, and your application code doesn't need to be changed. For the data store, I use Enhydra InstantDB (a relational database included with the Kodo distribution). The essence of JDO is that the developer does not need to know how the vendors persist data to a database, so I don't need to design any table here even though we are using a rela-

JDBC IMPLEMENTATION

Here I'll briefly describe how I implement the persistence of Book using JDBC. By knowing how much work is involved in this, you can better appreciate how much JDO does for you.

To persist Book to a relational database, I created four tables (see Figure 1). Based on data integrity, the nm field in the Book table is defined as a unique key. To trace the relation between each Block to its children and attributes, I assign a blockId to each Block. This blockId is generated (by incrementing 1 to the largest blockId in the Block table) every time a new Block is added.

Adding a Book object involves denormalizing the information within a Book object into four tables: Book, Block, BlockRelation, and BlockAttr. In particular, a blockId has to be generated for each Block. Furthermore, the tedious part is that Blocks are recursive, and I have to write code that recursively inserts the Block data.

For the example Book created in Listing 5, the tables will be populated as shown in Figure 2. As you can see , one Book is translated into many rows in four tables, so all inserts have to be wrapped in a transaction so that a Book is added all or none, never partially. Similarly, deleting a Book involves finding the appropriate rows to delete in each of the four tables, while wrapping all deletes in a transaction so that a Book is deleted all or none.

For better performance, I don't want to query four tables to recursively generate the Book object every time someone asks for a Book. Instead I created a BookCache that I populated at the beginning by generating all Book and Block objects from the four tables. As I add, delete, and update Books in the database, my code ensures that the BookCache is kept in sync. As a result of all this work done in maintaining a cache, to get a Book is as easy as looking up the cache by its name.

Fiorano vs. IBM and BEA

Integration Middleware

Features	IBM	BEA	Fiorano
Dynamically Change Business Processes	○	○	✓
Compose Applications With Coarse-Grained Components	○	○	✓
Selectively Deploy/Configure Services Across the Network	○	○	✓
Debug Multiple Services Remotely	○	○	✓
Use Multiple Languages and Scripts for Service Development	○	○	✓
Scale Smoothly with a Super-Peer Architecture	○	○	✓
Optimize business processes by exploiting data-parallelism	○	○	✓
Support Component Reusability and Team Development	○	○	✓
Benefit from a Low Total Cost of Ownership	○	○	✓

Fiorano is #1 in Standards based integration

Fiorano

Enabling Change at the Speed of Thought™

Download Free Evaluation Software today at www.fiorano.com

tional database behind the scenes. The vendor Kodo provides a tool called schematool to help me create those tables based on my metadata. All I need to do now is run the following to prepare the database for my object.

```
schematool –action refresh Book
schematool –action refresh Block
```

Next I compile my object classes as usual, then using Kodo's enhancer tool jdoc, I enhance my class file by running:

```
jdoc.Book
jdoc.Block
jdoc.BookPersistJDO
```

Here, as long as I put the unenhanced class files (Book.class, BlockPersist.class, BookPersistJDO.class) and the metadata file in a location where jdoc can find it, jdoc will then modify the bytecode of these classes to add methods necessary to make them PersistenceCapable or PersistenceAware. Classes with metadata will be enhanced to PersistenceCapable, while classes without metadata will be enhanced to PersistenceAware. In this example, Book.class and Block.class are enhanced to be PersistenceCapable while BookPersistJDO.class is enhanced to be PersistenceAware.

Once I've enhanced my code, any persistence work for my object can be done via the PersistenceManager. Using the code I showed you previously, I can easily get a PersistenceManager pm and then add, delete, or update a book using it. Listing 7 shows fragments of my code BookPersistJDO.java. The method addBook (Line 3) shows how I add a Book in JDO, and the method deleteBook (Line 13) shows how I delete a book.

To get a Book with a given name, I create a query using a Filter written with JDOQL. Executing the query, I get back a Collection of Book object that matches this query (Lines 25–29). Once I get a Book object, I directly update its field and then commit the changes.

Figure 3 shows the results of running my test on this implementation. The results are as I expected. First, I successfully added books to the data store, and when I add a book with the same name, it gives me a JDOUserException, showing that the unique book name integrity is violated. Next, I'm able to update a book, then keep the changes by committing, or discard the changes by rolling back. Last, I'm able to query the data store to get a book by its name, and then delete the book from the data store.

Author Bio

Teresa Lau has been an independent Java consultant for over five years, with an emphasis on financial systems. She holds an MS in computer science and currently works in New York.

NOT YET PERFECT

Despite all its advantages, there are still areas where JDO may not be perfect yet:

- It's good for new development, but to convert existing schema in a relational database to use JDO requires a bit of mapping work.
- As developers, we no longer deal with lower-level database access when using JDO, so it may be hard for us to tune performance. Since JDO implementation has to do a lot of extra work tracking the fields that are changed or synchronizing cache internally, etc., how well the JDO vendor implements it will be critical to performance.
- JDOQL does not have an aggregate function such as max, min, and sum like SQL does.
- It would be nice if there were better checking to catch bad JDOQL at compile time. For example, in a Filter, when you specify the field name in the class via a string, you can easily have specified a bad field name resulting in a JDOQL that will compile, but fail at execute time.
- Some people thought that JDO's advantage is that you don't have to write SQL anymore; the truth is now you have to learn to write JDOQL instead!

Comparison of Implementations

By using JDO and JDBC to tackle the same problem of persisting a Book object, I observed the following:

1. Using JDO, I'm able to achieve the same things I can achieve with JDBC. I can query objects using JDOQL; maintain data integrity by specifying the nm of a Book as a unique primary key; and add, delete, and update my object.
2. JDO makes my transaction handling easier. In my JDBC implementation, because one Book object actually translates to many rows in four different relational tables, I have to ensure that all inserts or deletes to tables are done in a transaction. On the contrary, JDO saves or deletes the whole object to the database in one operation, and I don't need to use transactions to maintain the atomicity of the action.
3. The fact that BookPersistJDO.java (140 lines) is so much shorter than BookPersistJDBC.java (480 lines) shows that JDO simplifies my code a lot. This is especially so given the recursive nature of my object and how complicated it is to represent it in relational tables. In my JDBC implementation, I have to put a lot of thought into the design of my tables so I can store and retrieve the recursive data. I have to generate an ID for each Block to use as a link for the child/parent relationship. In the JDO implementation, I don't have to think about any of that, and everything is already persisted correctly.
4. The effort I put into maintaining a cache for performance in my JDBC implementation is not needed in JDO, because the JDO vendors are the ones who would implement data caching for performance improvement. That saves me a lot of work because I don't have to worry about keeping my cache in sync with the database all the time.

Behind the scenes, the JDO vendor's implementation and my JDBC implementation are probably not much different. For example, this JDO vendor, using a relational database, may also have implemented it with a similar table design and ID generation scheme, and used JDBC to persist the data. However, the important point is I don't have to know about these implementation details: they're all offloaded to the JDO vendor who has expertise in that area, and who would likely implement it better. In addition, the vendor is also free to implement it with any other kind of data store like object databases and files, giving us more flexibility and choices on where to store the data.

Conclusion

JDO offers a lot of advantages for developers:

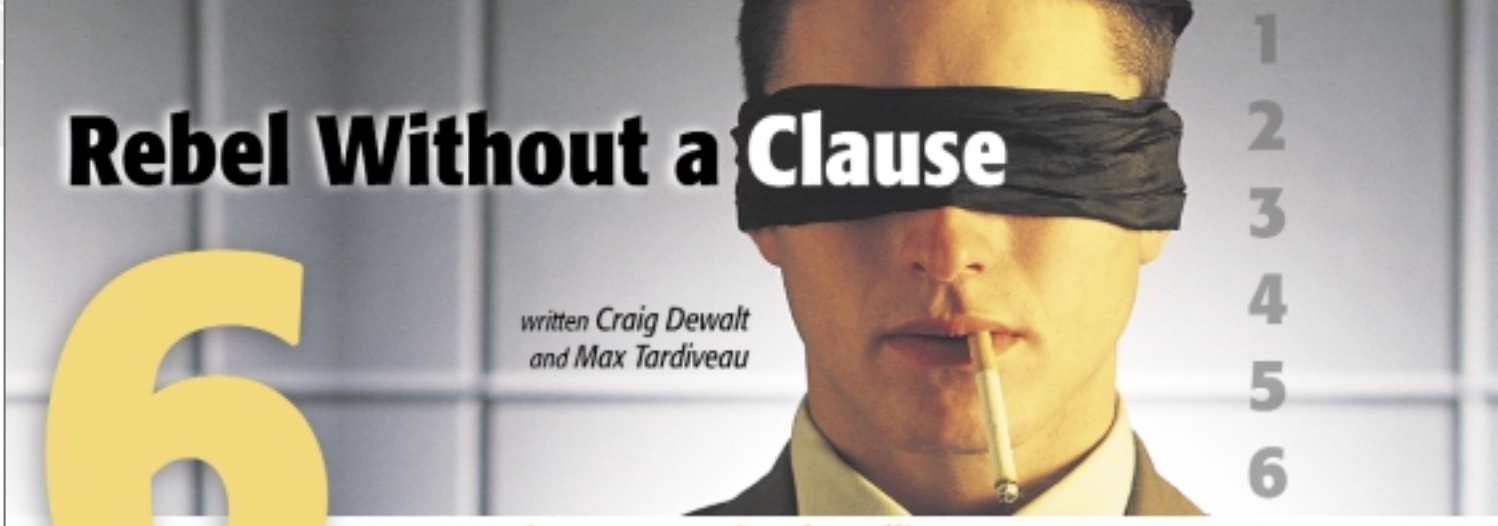
- It has all the basic functionalities needed for data persistence: add, delete, update, transaction, data integrity, and data caching.
- It takes over a lot of tedious work from the developer, making code easy and maintainable.
- It's vendor independent, preventing vendor lock in.
- Although my example doesn't show it, it can work on any data store, making development flexible and portable.

JDO is a technology that's worth exploring. This article is a starting point for you; for more information see the resources section.

Resources

- *The One-Stop Site for JDO:* www.jdocentral.com
- *The Specification:* http://access1.sun.com/jdo/
- Roos, R. (2002). *Java Data Objects*. Addison Wesley: www.OgilviePartners.com
- *The JDO Vendor I used in my example: SolarMetric:* www.solarmetric.com/Software/Kodo_JDO

ttylau@yahoo.com



6 ways to misuse exception handling

written Craig Dewalt and Max Tardiveau

Do you consider yourself a Java expert? Think you know everything about exception handling? Can you quickly spot the six exception handling problems below?

```
 1: OutputStreamWriter out = ...
 2: java.sql.Connection conn = ...
 3: try {    5
 4:   Statement stat = conn.createStatement();
 5:   ResultSet rs = stat.executeQuery(
 6:                 "select uid, name from user");
 7:   while (rs.next())
 8:   {
 9:      out.println("User ID : " + rs.getString("uid") + 6
10:        ", name : " + rs.getString("name"));
11:   }
12:   conn.close();            3
13:   out.close();
14: }
15: catch(Exception ex)        2
16: {
17:   ex.printStackTrace();  1-4
18: }
```

Every Java developer should be able to spot at least two. If you can't spot all six, read on.

Rather than provide general guidelines (most of which are well known), we decided to reveal what we call anti-patterns: (unfortunately) common bad programming practices that we've seen time and again in Java code. Our purpose is to familiarize you with these counterexamples so you can quickly spot them and avoid them.

Now for our hall of shame – the six most common misuses and abuses of exception handling.

- **ANTI-PATTERN #1: *try-catch-bury***

```
15: catch(Exception ex)
16: {
17:   ex.printStackTrace();
18: }
```

This is the bane of Java programming – catching an exception and not doing anything about it. In terms of frequency and severity, this is probably comparable to the infamous unchecked buffer problem in C and C++. If you see this anti-pattern, you can be 99% sure that it's wrong (there are a few cases where it might make sense, but they should be carefully commented to make it clear to the maintenance developer).

This is wrong because an exception (almost) always means that something bad (or at least unexpected) has happened, yet we choose to ignore and silence that cry for help. Calling printStackTrace does not qualify as "handling an exception" – it's okay for debugging but should not be present past that initial step.

This problem is frighteningly pervasive. If you look at the documentation for the JDK class ThreadDeath, you'll see the following comment: "The class ThreadDeath is specifically a subclass of Error rather than Exception, even though it's a 'normal occurrence,' because many applications catch all occurrences of Exception and then discard the exception." This poor programming practice is so common that, in an unhealthy feedback loop, it has affected the design of Java itself. Grunt.

What should you do instead? You basically have four options:

1. ***Handle the exception:*** Do something about it. Correct the problem, notify someone, or do some different processing, whatever makes sense in this particular situation. Once again, calling printStackTrace does not qualify as "handling the exception."
2. ***Rethrow the exception:*** This is not uncommon if your exception handling code examines the exception for additional information, and decides that it can't handle it after all.
3. ***Translate the exception into another exception:*** Most often this is used to translate a low-level exception into an application-level one.
4. ***Don't catch the exception:*** If you're not going to do anything about it, why bother catching it? Let it go (and, if necessary, declare it in the signature of your method).

Solution 1: *If you catch an exception, do something about it. Don't bury it.*

- **ANTI-PATTERN #2: *Pokémon – gotta catch 'em all***

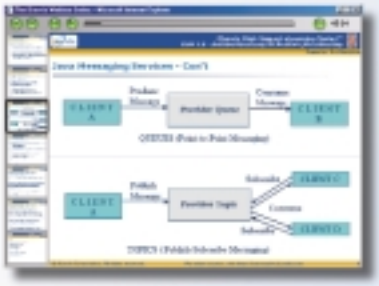
```
15: catch(Exception ex)
```

It's often tempting to have a general catch statement. The most common is undoubtedly catch(Exception ex). In almost all cases, that's a bad idea. Why?

ASK YOUR MANAGER

"Can we purchase these courses for our developers? They are short, high-impact, developed by industry experts, and **just $29 each!**"

Self-service purchase, instant access ... visit http://community.isavvix.com today!



How It Works!

The iSavvix High-Impact eLearning Series™ is designed to deliver online training in the most efficient manner possible. Each course is approximately one to two hours in length with no "homework" assignments. The course slides/audio can be viewed/heard online on our web site in Macromedia Flash format. In addition, the course slides can be downloaded in PDF format for printing.

Partial List of Courses:

The Struts Framework

Struts is an open source framework useful in building web applications with Java Servlet and JavaServer Pages (JSP) technology. If you haven't used it yet, here's your chance to see why you should. This course focuses on how to use the Jakarta Struts project in your application development. Based on the Model-View-Controller pattern, the framework brings a significant advantage to your application development -- which explains the rapid growth in popularity of the Struts project.

Getting Started with XSLT

Over the last several years, XML has gained acceptance in a wide variety of business applications-but XML itself is not enough. XSLT, eXtensible Formatting Language Transformations, is one of the keys to bringing XML to life. It is a rich and versatile language that enables you to create HTML on the fly or transform business data from one XML "dialect" to another. This course will give you the essential knowledge you need to get started with XSLT.

J2EE Features and Functionality

This course will provide a summary of the components within the J2EE API. It is designed as an introduction to the extended features of the Enterprise Edition, and perfect for those already familiar with Java who want to understand more about Enterprise Application Development. Concentration will be placed on both client and middle tiers, including Servlets, JSPs, EJBs and JMS, first reviewing the fundamentals then providing code examples for each. An overview of those technologies new to J2EE, including JTA, JCA and Message-Driven Enterprise Java Beans will also be included.

Java Best Practices

Take your J2SE, J2EE, and J2ME skills to the next level with this informative, high-impact presentation of Java Best Practices from a noted author, mentor, and trainer.

Java has become a tremendously popular programming language in the last few years. As is the case with any new language, once the initial hype has died down and the excitement of the language's "newness" subsides, performance and efficiency become key.

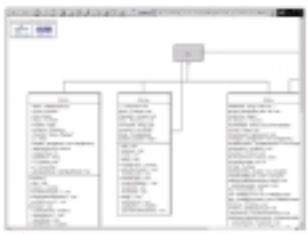
Java Performance Tuning

Developing with Java has many advantages. One of the key advantages is the capability to rapidly develop working applications. This ease of application development often comes at the expense of optimization. Developed applications are not always optimized for maximum speed and the most efficient use of memory. Over time many optimization techniques have been developed to optimize the performance of Java applications.

In this course you will learn many of the Java performance tuning techniques that are applied daily in the application development world. Once you become familiar with these techniques you will begin to use them instinctively as you write additional applications. Your reward will be applications that perform substantially more efficiently than un-optimized systems.

For more information, visit http://community.isavvix.com or contact us today!

PLUS ... lots of FREE tools/resources for you!



My UML Diagrams
Class diagrams on-the-fly from you Java code!

My Dev Space
Free JSP Hosting, XML/XSL, J2SE 1.4, tag libs...

Many more:
Discussion forums, white papers, bookmarks, secure file storage, download links, code sharing, and much more...

About iSavvix

iSavvix is an information-technology consulting and services company that provides custom solutions based on Enterprise Java™, XML and related technologies. Since its inception in 1996, iSavvix has built robust, secure, user-friendly, and cross-platform enterprise applications for many Fortune 1000 and other leading companies.

iSavvix
Delivering Java Technology Solutions for your eBusiness

iSavvix Corp. Herndon, VA, +1-866-iSavvix, info@isavvix.com

To understand why, we need to step back and consider the purpose of a catch statement. You use a catch statement to indicate that you anticipate certain exceptions and that you're willing to handle them. The class of the exception(s) is how you tell the Java compiler which exceptions you want to handle. Since the vast majority of exceptions inherit directly or indirectly from java.lang.Exception, specifying that in your catch statement effectively says you want to handle almost any exception.

Let's look at the code sample again. What kind of exceptions are we likely to catch? The most obvious one is SQLException, quite likely to happen any time you deal with JDBC. IOException is another possibility – we're dealing with a stream writer. You can already see the problem: it doesn't make sense to handle these two (very different) types of errors in the same catch block. It would make a lot more sense to have two catch blocks, one for SQLException and one for IOException.

In addition, a large number of other exceptions could occur. What if, for some obscure reason, executeQuery returns null? You'll get a NullPointerException in the next line, yet that (unexpected) exception will be ignored (unless you happen to be looking at the console for your program – and even then, unless you wrote that code yourself, what good does that do you?).

The better approach is to be more specific. In this case, we should have two catch blocks, one for SQLException, the other for IOException. This makes it clear to the next reader of this code that you have thought about these scenarios. But what about all the other exceptions? Let them go. Don't handle them (unless you have a reason to). You cannot (and in fact should not) try to handle all possible exceptions – let them bubble up; someone else will deal with them (the JVM if nothing else).

There are some instances where catching Exception is a good idea, especially when testing or debugging. Once you have isolated the cause of the problem, you need to remove the catch Exception and replace it with the appropriate kind of Exception(s).

Solution 2: *Be as specific as possible in your catch statements and use multiple catch statements if necessary. Don't try to handle all possible exceptions.*

- **ANTI-PATTERN #3:** ***The forgotten bathroom key***

```
 3: try {
 4:   Statement stat = conn.createStatement();
 5:   ResultSet rs = stat.executeQuery(
 6:                 "select uid, name from user");
 7:   while (rs.next())
 8:   {
 9:      out.println("User ID : " + rs.getString("uid") +
10:        ", name : " + rs.getString("name"));
11:   }
12:   conn.close();
13:   out.close();
14: }
```

"Finally is a **wonderful thing**; it allows you to **guarantee** that your **cleanup code** will be **executed** before **the end** of the **try/catch/finally** block"

One of us used to work in a small office with only one bathroom and you had to use a key. One programmer was notorious for neglecting to return the key to its rightful place, thereby inconveniencing the rest of the office. Often this was because he would get interrupted while coming back to his desk and would forget to return the valuable resource.

Similarly, when an exception occurs, it affects the execution path of your program. It's easy to overlook that simple fact. If you use resources such as files, sockets, JDBC connections, etc., you need to make sure they're properly closed and released even if an exception occurs. Java has a mechanism designed for such a thing: finally.

Finally is a wonderful thing; it allows you to guarantee that your cleanup code will be executed before the end of the try/catch/finally block, regardless of whether or not an exception is being thrown. Think of it as a string on your finger that reminds you to return the bathroom key, even if something distracts you. Yet finally is rarely used, even by intermediate programmers.

Of course, finally blocks should be written with great care. In particular, you should be careful about exceptions being thrown in a finally block – this is your final chance to clean things up; don't let it slip. In some cases, it may be acceptable to bury an exception that's thrown in a finally block. Think of it as a best effort. Regardless, use your best judgment, or better yet, ask someone more experienced.

Solution 3: *Make sure all resources are properly released. Use finally liberally.*

- **ANTI-PATTERN #4:** ***If you don't know why I am mad, I won't tell you***

```
 3: try {
 4:   Statement stat = conn.createStatement();
 5:   ResultSet rs = stat.executeQuery(
 6:                 "select uid, name from user");
 7:   while (rs.next())
 8:   {
 9:      out.println("User ID : " + rs.getString("uid") +
10:        ", name : " + rs.getString("name"));
11:   }
12:   conn.close();
13:   out.close();
14: }
15: catch(Exception ex)
16: {
17:   ex.printStackTrace();
18: }
```

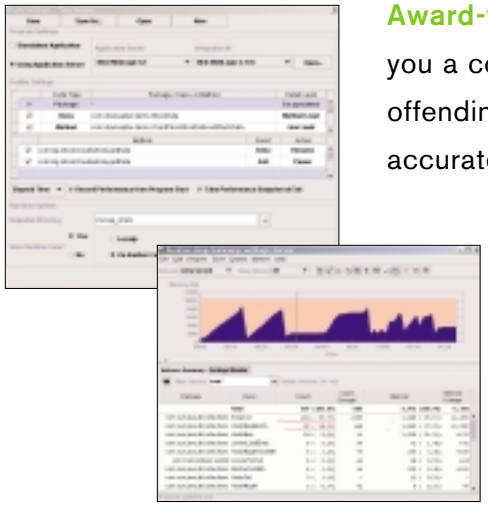
Anyone who has been married for a number of years can relate to this situation. Look at the code again: what happens if an exception occurs during the execution of the loop? Will we get information that can tell us what causes the loop to fail? Not really. All we'll get is an indicator that something is wrong in the area of the class that's doing the processing, but we may not get any input as to what caused the problem.

The basic "stack trace" that shows the path of execution to the class that caused the exception is cryptic and not easily parsed. It also causes any tester without a Java development background to report application problems with a very general description such as "encountered an ugly Java problem." If such an exception is wrapped to display a message in plain

Ensure high-performing Java™ code, wherever it runs

JProbe®

Now part of QUEST SOFTWARE



Award-winning JProbe provides deep J2EE diagnosis tools that give you a complete picture of your Java application, right down to the offending line of code. JProbe includes everything you need for fast, accurate analysis of your application servlet, JSP and EJB code.

Track down inefficient algorithms, memory leaks, threading problems and untested code. JProbe works virtually everywhere with unrivaled application server, JDK and operating system support.

JProbe Suite

JProbe Profiler

JProbe Memory Debugger

JProbe Threadalyzer

For more info and a free eval, visit:
www.sitraka.com/jprobe/jdj

sitraka

English, testers are more likely to repeat the specific message displayed to them. Not everyone who tests business applications is experienced in the delicate art of stack trace interpretation.

In addition to displaying a more user-friendly message, there's great benefit in providing a little extra data such as the Class, Method, and a text message. While it's true this information can be obtained from the stack trace, it's much easier to read when it's isolated. Also, taking the extra time to describe the behavior when you're creating the code will greatly expedite resolving the problem later.

One solution is to embed a snippet like the following one wherever exceptions get logged in the application. You can use the this.getClass().getName() method, and insert the method named and a text message every time the program reports a checked exception. This practice makes exceptions easy to read and to parse.

```
this.getClass().getName(), "mymethod", "some message"
```

One caveat to this approach is that with a static method call you need to manually insert the class name because the "this" object reference does not have a this to refer to. Simply replace the this.getClass().getName()with your class name "myClass".

Solution 4: *Report a reasonable amount of data in a way that's easy to read.*

- **ANTI-PATTERN #5:** ***Overzealous try***

```
 3: try {
 4:   Statement stat = conn.createStatement();
 5:   ResultSet rs = stat.executeQuery(
 6:                 "select uid, name from user");
 7:   while (rs.next())
 8:   {
 9:      out.println("User ID : " + rs.getString("uid") +
10:        ", name : " + rs.getString("name"));
11:   }
12:   conn.close();
13:   out.close();
14: }
```

Putting too much activity in a single try block is a bad programming practice, even though it's common. The reason it's common is that it takes extra time to isolate what could go wrong in a particular block and what exceptions could get created as a result of this processing. Wrapping too many statements in a giant catch is like preparing for a move by packing your household goods in refrigerator-sized boxes. Sure, all your goods are in one place, but imagine the sorting task you'll have in the near future. For the inexperienced developer, it's easier to put a bunch of statements in a try block and wrap it up in a generic catch Exception than to isolate the statements. This practice makes troubleshooting Exceptions generated during program execution that much more difficult because there are more variations to check to find out what caused the Exception.

The code example doesn't really illustrate this fully because there's not enough space to show a complete example, but this is a common problem.

Solution 5: *Keep try blocks as small as possible, but no smaller.*

- **ANTI-PATTERN #6:** ***Incomplete execution***

```
7:   while (rs.next())
8:   {
9:      out.println("User ID : " + rs.getString("uid") +
10:       ", name : " + rs.getString("name"));
11:  }
```

This is the silent killer of Java systems. Look at the code again and imagine what happens if an exception is thrown in the middle of the loop. The execution of the loop will be interrupted, the catch block will be executed, and that's about it. What about the data that we're writing out? It will be silently incomplete. Whoever or whatever is supposed to use this data will receive incomplete (and hence incorrect) data, but will probably have no idea that it is incomplete. For some systems, that's a problem far more serious than any crash.

A better approach here would be to attempt to write a message to the output, signaling that the data could not be completely written. Another possibility would be to buffer the output (if possible) and write it out once we have it ready to go.

Solution 6: *Consider all likely exceptions and how they'll affect the flow of execution.*

Example (Rewritten)

Given these facts, Listing 1 shows what the same code should look like. (Listing 1 can be downloaded from www.sys-con.com/java/sourcec.cfm.) Note that it's quite a bit more verbose. That's not a bad thing – good code often includes a lot of error handling.

Conclusion

All the anti-patterns in this article were inspired by actual code written by professional programmers. Before you snicker, ask yourself whether your code is really free from these poor practices. Even the most experienced programmers sometimes fall back into them, simply because they're easy (we certainly do). Think of them as bad habits – they are notoriously difficult to shake off, but just trying makes you a better person.

Of course, nothing in this article should be taken as gospel. Use common sense and your experience. For each anti-pattern described here, you could certainly come up with counterexamples. As long as the rules are broken willingly and thoughtfully, you have our blessing, but we do beg for one favor: if what you do is not obvious, please write a nice comment. You'll thank yourself later. Also, share your wealth of knowledge with others on your team; extra time spent on training is a small price to pay in comparison to a massive refactoring effort at the end of the development cycle.

References

- Haggar, P. (2000). *Practical Java: Programming Language Guide*. Addison-Wesley.
- Ambler, S.W., et al. (2000). *The Elements of Java Style*. Cambridge University Press.
- *The Sun Java online tutorial:* http://java.sun.com/docs/books/tutorial/essential/exceptions
- Bloch, J. (2001). *Effective Java: Programming Language Guide*. Addison-Wesley.

Author Bios

Craig Dewalt is a surfer who likes to lead Java development teams.

Max Tardiveau is the founder of Integrity Logic.

max@tardiveau.com

goflyr@yahoo.com

ARE YOU READY FOR THE FUTURE OF TECHNOLOGY?

PRICEWATERHOUSECOOPERS

A shared IT infrastructure...smart handhelds that are powerful enough to be useful...networked cars with easy-to-use interfaces... reliable IP telephony at the desktop...multimedia messaging on mobile phones...self-healing computer systems. What technologies should your enterprises be prepared for?

The PricewaterhouseCoopers Global Technology Centre is pleased to announce the release of the anticipated second volume of ***Technology Forecast: 2002–2004. Emerging Patterns of Internet Computing*** discusses the changes underway in IT and forecasts significant developments in technology over the next three years. The book is divided into three major sections, each highlighting a different area of computing and communications, that together comprise 12 chapters with detailed coverage of specific technologies, including Processors and Platforms, Communications, and Web Application Management. In addition, the book features interviews with four leading figures in IT. Take advantage of Technology Thought Leadership at its best with a **Special *Sys-Con.com* discount offer at www.pwcglobal.com/tech-forecast_syscon**. Visit the PricewaterhouseCoopers Global Technology Centre website at www.pwcglobal.com/techcentre.

JASON R. BRIGGS J2ME EDITOR

Spring . . . A Time of Change

This will be my last outing as J2ME Editor for ***JDJ***. It's been an interesting 22 issues, with big changes within both the Java and the J2ME spaces. Over the past two years, the number of JSRs related in some way to J2ME has increased (almost exponentially), an assortment of competitors have emerged challenging the dominance of both the Java language and the various editions of the platform, and new technologies have come…and just as quickly gone.

The number of J2ME devices, specifically MIDP, has increased as expected, but there still seems to be a lack of brand awareness among the nontechnical public. Java's steaming coffee cup might be instantly recognizable to those reading this magazine, but there's a major "Huh?" factor if someone outside the technical community sees it on a phone. Maybe it makes sense to differentiate the various configuration/profile combinations by giving them their own individual brands (and a better name than MIDP would be a good start), and marketing material to go along with them would be helpful. John and Jane Q. Public aren't going to know what the hell MIDP is unless there's a nice glossy brochure included in the box with their phone, perhaps with a few color screenshots of games, instructions on how to download more, where to find other applications, etc., etc., etc.

I recently took a moment to look at back issues of *JDJ* and pick out some of my favorite articles from the past two years.

Tom Sloper's "Freedom Through Constraints" (Vol. 6, issue 9) stands out near the top of my list. Tom has been a designer and producer of games since the Dark Ages, and gave his unique perspective on designing games for restrictive environments – MIDP in a nutshell. Some of the fundamental ideas presented in that article are worth considering if, as a MIDP developer, you find you also have to wear the designer's hat.

"Architecting Mobile/Wireless" by James White (Vol. 7, issue 4) was another good primer for those entering the wireless development space and included such topics as managing user expectations, device familiarity, and requirements gathering; all useful stuff if you're just getting started.

Rounding out my top three, and more recent in the back list, was Bill Ray's series "Whole House Audio from the Palm of Your Hand" (Vol. 7, issues 6, 9, and 10), a dissertation in the best tradition of mad scientists, Radio Shack, and DIY.

Taking over the reins of the J2ME section is Glen Cordrey, who has appeared before within the pages of this venerable tome. He is a senior architect – funnily enough, involved in the very technology this section is about – has spoken at JavaOne, authored Nextel's J2ME Developer's Guide, and is a member of the MIDP Next Generation Expert Group – the ideal candidate to carry *JDJ*'s J2ME coverage forward. I wish him the best of luck.

One final note: rumors that I am leaving *JDJ* to write an exposé about the secret sordid lives of a development magazine's editorial staff are completely unfounded. First, I'm not leaving (I'm just going to wear a contributing editor's hat instead), and second, it's not an exposé…

…it's a groundbreaking fusion of epic poetry and gangsta rap, translated into Old English by an underpaid postgrad and performed live by a Scottish troupe of double-jointed acrobats with a penchant for g-strings and gumboots.

jasonbriggs@sys-con.com

AUTHOR BIO

As well as being a contributing editor for Java Developer's Journal, Jason R. Briggs is a Java programmer and development manager for a wireless technology company, based in Auckland, New Zealand.

J2ME INDEX

QUALCOMM

DEVELOP AN APP. DEVELOP A RELATIONSHIP.

WITH WIRELESS CARRIERS, WHO ARE CONNECTED TO MILLIONS OF USERS.

brew™ 2003

April 28 - 30

San Diego, California

BREW™ 2003. It could be the beginning of something beautiful. And a great way for you to build relationships with the world's leading wireless carriers and millions of their subscribers. All you need to do is register now for the BREW 2003 Developers Conference. There are technical tracks, guest speakers, business sessions and more. You never know what might develop. Register at www.brew2003.com.

BREW 2003 DEVELOPERS CONFERENCE

Register Now:

www.brew2003.com

The Mighty WAP Strikes Out!

And J2ME is at bat

WRITTEN BY
CHUCK GAUTNEY

Somewhere in the conglomerate of sponsor companies and forum management, the Wireless Application Protocol (WAP) specification committees lost track of their objectives. If you look at the challenges faced by developers of wireless applications, you'll find that WAP does not address the main problems.

First, we don't have 100% wireless coverage by any carrier and most likely we never will. One of the design constraints a wireless application must address is a disconnected mode of operation. WAP's protocol is a connectionless protocol; however, WAP does not run in a disconnected mode of operation. *Strike one!*

The WAP specification describes the user interface components; however, it does not define implementation details. This causes applications to work differently based on the phone's WAP browser. For example, a simple select list functions differently on an OpenWave browser than it does on a Nokia browser. Nokia Select lists are a three-screen process (see Figures 1–3). The OpenWave Select list is a single screen (see Figure 4). This causes lots of implementation issues; especially when trying to write an application that will work in the United States and Europe. *Ball one.*

As mobile networks increase speed, bandwidth, and coverage, mobile applications must be adaptable to take advantage of these features. While WAP will run faster in these networks, it doesn't have the ability to take advantage of the networks' increased bandwidth. For example, let's say I have a wireless PDA device and I'm downloading a 2MB spreadsheet. If I'm on a 3G, the download request should be split into multiple downloads over multiple downlink channels to increase throughput and decrease the download time. In a WAP environment this is done with a single channel in a serial manner. *Strike two!*

A WAP microbrowser is a software application so it's always being enhanced with new capabilities. It would be nice to be able to update the browser on the phone to the newest release and not have to buy a new phone. I've been told there are phones that can be upgraded but I have yet to find one. *Ball two.*

New devices with increased functionality, memory, processing power, communication channels, and graphical capabilities are rapidly being released. When writing a mobile or wireless application, it's extremely beneficial to be able to use these new features to allocate memory and storage, and to take advantage of the increased graphics capabilities of the device. Unfortunately, WAP only addresses communication down the carrier network and does not provide a way to adapt to the device's increased capabilities. *Strike three!*

I can continue, but in my book three strikes and you're out. WAP is out! It's no surprise that the adoption rates (the percentage of users who use an available application on a regular basis) for deployed WAP applications fall below 3% – and I didn't even go into the problems of usability with WAP's list-based application design. So what options do you have for wireless application development? In one word: Java.

J2ME

What Java did for the world of Web-based applications, it's now doing for the world of wireless applications. Java provides storage capabilities, multiple network channel interfaces, adaptable components, and advanced graphical capabilities, making it far superior to other languages.

Storage

How does J2ME address the lack of coverage? By providing Java components for persistent storage known as the Record Management System (RMS). RMS allows a developer to create single or multiple data stores for the application, allowing applications to be run without a network connection. A simple example is mail.

In J2ME I can write a mail application that will allow me to create draft e-mails, save them to storage, review and modify them, and not use a single minute of wireless time or a single byte of data traffic. Try doing this with a WAP solution.

The following example demonstrates how you can achieve localized storage using WAP. Normally, if you wanted to save user information between decks (WML is organized into decks and cards where a deck consists of one or more cards), you would pass the information in the parameters section of an HTTP Post request. However, you can save a variable and reference that variable in subsequent decks. Be careful not to initialize the variable in a subsequent deck because you'll lose the value. *Note:* If one of the incoming decks performs a newcontext, the current variables will be cleared.

Listing 1 defines how storage might be done in a J2ME application. (Listings 1–3 can be downloaded from www.sys-con.com/java/sourcec.cfm.)In addition, J2ME provides components for filtering, comparing, enumerating, and listening for record modification events.

Communication

In a J2ME architecture, the Mobile

Premiering
June 2003
at
JavaOne

www.sys-con.com

Millions of Linux Users One Magazine

Linux Business and Technology

There is no escaping the penetration of Linux into the corporate world. Traditional models are being turned on their head as the open-for-everyone Linux bandwagon rolls forward.

Linux is an operating system that is traditionally held in the highest esteem by the hardcore or geek developers of the world. With its roots firmly seeded in the open-source model, Linux is very much born from the "if it's broke, then fix it yourself" attitude.

Major corporations including IBM, Oracle, Sun, and Dell have all committed significant resources and money to ensure their strategy for the future involves Linux. Linux has arrived at the boardroom.

Yet until now, no title has existed that explicitly addresses this new hunger for information from the corporate arena. *Linux Business & Technology* is aimed squarely at providing this group with the knowledge and background that will allow them to make decisions to utilize the Linux operating system.

Look for all the strategic information required to better inform the community on how powerful an alternative Linux can be. *Linux Business & Technology* will not feature low-level code snippets but will focus instead on the higher logistical level, providing advice on hardware, to software, through to the recruiting of trained personnel required to successfully deploy a Linux-based solution. Each month will see a different focus, allowing a detailed analysis of all the components that make up the greater Linux landscape.

Regular features will include:

- *Advice on Linux Infrastructure*
- *Detailed Software Reviews*
- *Migration Advice*
- *Hardware Advice*
- *CEO Guest Editorials*
- *Recruiting/Certification Advice*
- *Latest News That Matters*
- *Case Studies*

SAVE 30% OFF!

REGULAR ANNUAL COVER PRICE $71.76

YOU PAY ONLY

$49.99

12 ISSUES/YR

**OFFER SUBJECT TO CHANGE WITHOUT NOTICE*

SUBSCRIBE TODAY!

WWW.SYS-CON.COM
OR CALL
1-888-303-5282

LINUX EDGE conference&expo

June 3–5 .....LONDON
June 24–26 .....BERLIN
September ..HONG KONG
October .....CALIFORNIA

FOR ADVERTISING INFORMATION:
CALL 201 802.3020 OR
VISIT WWW.SYS-CON.COM

SYS-CON MEDIA
The World's Leading i-Technology Publisher

FIGURE 1 Select list to modify

FIGURE 2 Select option

FIGURE 3 Choose selection

FIGURE 4 Select list

Information Device Profile (MIDP) sits on top of the Connected Limited Device Configuration (CLDC). Among other things, the CLDC provides an interface to the device's I/O channels. These channels can be for the wireless connection, serial connection, or other I/O channels handled by the device and KVM. Not only does a developer have a choice of channels, but he or she can also choose the type of communication such as HTTP(S), Datagram, and even socket protocol.

Note: The MIDP 1.0 specification does not require a socket protocol, so it's not guaranteed to be there. However, HTTP is a socket-based protocol so it seems logical that the socket protocol would be available. So far all my testing has found that the socket protocol is available. Socket communication means that you now have the ability to provide an always-on, two-way connection. Why is this significant? It allows an application to have data pushed from the server to the application. For example, a developer could add functionality to the e-mail program to allow for new e-mail to be pushed to the device as soon as it's received on the server. No more clicking a button and asking the server for data.

Interfaces

Now that the devices may have a Bluetooth and 802.11(x) card built in, it's desirable to take advantage of these interfaces. Good luck doing this with WAP! Not a problem with Java. Because Java has an abstraction layer for communication, your program will work the same whether you're using the mobile operator's communication channel or the onboard local wireless channel. This also opens the door to using the mobile device as a gateway and sharing the mobile operator wireless channel with other devices like a PDA, telematics system, or laptop. Just think, you can use your laptop to communicate with your phone via a Bluetooth connection. If the connection seems too slow, turn on a second phone, make it available to the laptop, and now you've doubled your bandwidth.

The following code demonstrates how to establish and read from different types of protocols.

```
String connectionString =
"socket://servername.company.com:port"
;
StreamConnection sc =
(StreamConnection)Connector.open(
connectionString );

read = sc.read( readBuf , 0 , readMax
);

connectionString = "serial://comm:0";
StreamConnection sc2 =
(StreamConnection)Connector.open(
connectionString );

Read2 = sc2.read( readBuf2 , 0 ,
readMax2 );
```

By using the Connector class you simply provide the connection string and you can access any channel on the device that's accessible from the KVM. The connection strings vary by device vendor so you'll need to check with your device's users guide to determine which interfaces are available and the proper connection string properties.

Want to take advantage of next-generation networks and the enhanced power of the mobile device? You can do this with Java's threading capabilities and the ability to create multiple connection objects. The most advantageous is creating multiple download channels so data can be collected in parallel rather than in a serial manner, making the download much faster. This is very similar to how download accelerators work on the Internet.

Do you currently pass your business card to others using an infrared port? Using J2ME you can write a simple Web server and pass your business card using HTTP via a Bluetooth or live Internet connection. It's all possible in Java.

The most significant difference that Java has over WAP is the graphical user interface. The graphical interface capabilities of Java is the main reason for Java's high level of adoption. The one drawback is that the graphical capabilities of Java are not exploited by the standard components, which are actually very WAP-like. One reason the adoption rate of WAP applications is so low is the nature of list-based user interfaces. It takes time to learn the navigation paths and requires a lot of unnecessary user interaction to get to the information a user might want.

It's also easy to get lost within the lists. Java provides a canvas component, so with a little bit of imagination, some coding, and a lot of testing you can develop an application that functions much like a desktop application. A canvas works well for creating screens to select items from the screen, but due to midlet size restrictions it's not well suited for text entry. Under MIDP 1.0, you're stuck with the standard item–based components that don't provide methods for color, font, or orientation.

Good news: this has been addressed in MIDP 2.0 by the CustomItem component. This component can be extended to provide an almost canvas-like functionality to a single item that can be appended to a form component. Listing 2 provides a sample of what could be used to draw a map or other picture (see Figure 5).

FIGURE 5 Street map

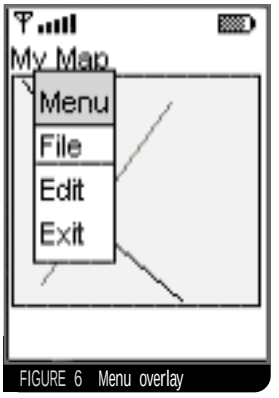


FIGURE 6 Menu overlay

Listing 2 demonstrates the drawing capabilities of a canvas. The canvas also has an event listener that listens for the pressing of a key or the touching of the screen. Listing 3 demonstrates how you would listen for the menu key to be selected, creates a pop-up menu component, and finally determines which menu option was selected (see Figure 6).

Take this code to the next level and try building pop-up toolbars, drop-down menus, graphical buttons, and many more components to which users are accustomed. It's this type of functionality that will make the transition from desktops to smaller mobile devices possible. No more learning a complex list scheme that changes at a moment's notice. Now wireless devices can use common desktop components that you already know how to use.

Goodbye WAP, we hardly knew ya.

AUTHOR BIO

Chuck Gautney is chief technology officer and vice president of product development for Defywire, a leading provider of wireless enterprise software solutions. By utilizing Java, Defywire's solutions are device- and network-agnostic, allowing enterprises to gain a competitive advantage by retaining and leveraging their current IT investments.

cgautney@defywire.com

SaturdaySessions

We understand the pressures of work and how difficult it can be to get time off. That is why we have designed this workshop to be held in one day and, as a special bonus, on the weekend, so no days off from work. **Your boss will be happy!**

Alan Williamson
JDJ Editor-in-Chief

JDJ Workshop with Alan Williamson

M	T	W	T	F	S	S

Coming to you...

April:
NEW YORK
WASHINGTON, DC

May:
BOSTON
TORONTO

June:

Performance > Efficiency > Reliability

This one-day intensive workshop is designed for developers who wish to increase the efficiency and reliability of their code development.

1) The day will begin by looking at the various hints and tips you can utilize at the code level to improve the quality and reduce the number of bugs you have to contend with.

2) The next part will look at Apache's Ant and how you can use this freely available tool for your own development, irrespective of your IDE.

3) Last, and most important, as the old saying goes: "You can never do enough testing." This session will look at JUnit and show you how to start building test harnesses for your code so you can begin your testing strategy.

>Performance

Java is a powerful language. While it offers a rich array of tools, the fundamentals mustn't be overlooked. Improving your code at the core layer will result in great improvements in efficiency and produce (hopefully) less bugs. We'll look at the do's and don'ts of programming and learn many hints and tips that will accelerate your Java coding.

>Efficiency with Ant

Apache's Ant is a powerful scripting tool that enables developers to define and execute routine software development tasks using the simplicity and extensibility of XML. Ant provides a comprehensive mechanism for managing software development projects, including compilation, deployment, testing, and execution. In addition, it is compatible with any IDE or operating system.

> Reliability with JUnit

A critical measure of the success of software is whether or not it executes properly. Equally important, however, is whether that software does what it was intended to do. JUnit is an open-source testing framework that provides a simple way for developers to define how their software should work. JUnit then provides test runners that process your intentions and verify that your code performs as intended. The result is software that not only works, but works in the correct way.

What you will receive...

- ✓ *INTENSIVE ONE-DAY SESSION*
- ✓ *DETAILED COURSE NOTES AND EXCLUSIVE ONLINE RESOURCES*
- ✓ *JDJ CD ARCHIVE*

ONLY $295*
*JDJ subscribers ($395 non-subscribers)
*GROUP DISCOUNTS AVAILABLE

To Register

www.sys-con.com/education

Call 201 802-3058

SPONSORED BY
JAVA DEVELOPER'S JOURNAL

PRODUCED BY
SYS-CON EVENTS

PRESENTED BY
SYS-CON TECHNOLOGY EDUCATION

CORDA Leads Data Visualization Industry with OptiMap

(*Lindon, Utah*) – CORDA Technologies, Inc., has introduced a new product called OptiMap. It's a charting solution for creating dynamic Web-based maps. The resulting maps can integrate and display data from multiple databases.

OptiMap is fully compatible with the PopChart family of charting and graphing solutions. The product can be integrated with PopChart for implementations that require both mapping and traditional Web charts and graphs.

www.corda.com

ReportMill 6 Builds on Java App Reporting Success

(*Dallas, TX*) – ReportMill Software, Inc., has announced the release of ReportMill 6, a Java application reporting tool. The new version offers new XML-based design features, new Crosstab style display options, significant performance improvements, and many other new features.

www.reportmill.com

Borland Announces Java Development Tools

Running with its recent acquisition of TogetherSoft, Borland has announced a pair of products – Together Edition for JBuilder and Enterprise Studio 5 for Java – to put new tools in the hands of enterprise developers creating Java applications.

Together Edition for JBuilder integrates with Borland's own JBuilder development environment, while Enterprise Studio 5 – a suite of five components, including Together Edition, JBuilder, Optimizeit Suite, Enterprise Server, and JDataStore – offers an end-to-end development and deployment platform for enterprise Java.

Borland Enterprise Studio 5 will ship in March.

www.borland.com

Motorola to Launch Linux and Java-Based Phone

(*Libertyville, IL*) – Motorola, Inc., has announced the Motorola A760, the world's first handset that combines a Linux operating system and Java technology, with full multimedia PDA functionality.

The Motorola A760 combines the features of a mobile phone with the capabilities of a personal digital assistant (PDA), digital camera, video player, MP3 player, speakerphone, advanced messaging, instant Internet access, and Bluetooth technology.

www.motorola.com

SYS-CON MEDIA ANNOUNCES SIXTH ANNUAL *JDJ* READERS' CHOICE AWARDS

(*Montvale, NJ*) – SYS-CON Media's Sixth Annual ***Java Developer's Journal*** Readers' Choice Awards, also known as the "Oscars of the software industry," are open for voting. The *JDJ* Readers' Choice Awards program has become the most respected industry competition of its kind.

This year, *JDJ* added six new award categories including "best Web caching for J2EE" and "best Java persistence architecture."

JDJ readers will be casting their votes through August 30, 2003, and the finalists and winners will be announced at JDJEdge 2003 West in Santa Clara, CA, Oct. 19–22.

www.sys-con.com

THE LARGEST WEB SERVICES, JAVA, XML AND .NET CONFERENCE AND EXPO IN THE WORLD!

Boston 2003 | London 2003 | Berlin 2003 | Hong Kong 2003

JDJ EDGE conference&expo
web services EDGE conference&expo
.NET EDGE conference&expo
XML EDGE conference&expo

Register by February 14th SAVE UP TO $400
Register by March 14th SAVE UP TO $200

3rd Annual

EAST Web Services Edge Conference & Exposition

FINAL PROGRAM

Connecting the Enterprise with Web Services, Java, XML, & .NET

March 18–20, 2003
Hynes Convention Center
Boston

CALL TODAY TO REGISTER
201-802-3058
OR REGISTER ONLINE AT
www.sys-con.com

Event Sponsors

Microsoft · Sun microsystems · SYBASE · IONA · DIGITAL EVOLUTION · COMPUWARE · ORACLE · hp invent · Rational the e-development company · ALTOVA

Media Sponsors

JAVA DEVELOPER'S JOURNAL · JavaWorld · WebServices JOURNAL · LINUX BUSINESS WEEK · XML JOURNAL · SAMS · BASIS · Perl.com DEVELOPER'S JOURNAL · .NET DEVELOPER'S JOURNAL · SD Times · asp.netPRO · WebSphere DEVELOPER'S JOURNAL · WebLogic DEVELOPER'S JOURNAL · wireless · CF Advisor · COLDFUSION Developer's Journal · PowerBuilder Developer's Journal

OWNED BY SYS-CON MEDIA

PRODUCED BY SYS-CON EVENTS

web services EDGE conference&expo

JDJ EDGE conference&expo

.NET EDGE conference&expo

XML EDGE conference&expo

THE LARGEST WEB SERVICES CONFERENCE & EXPO

FEATURES & ATTRACTIONS

- **3 Days Packed with Education and Training**
- **4 Keynotes & 3 Panel Discussions**
- **60 Hard-Hitting and Current Seminars**
- **FREE .NET Tutorial with Russ' Tool Shed**
- **Web Services & XML Tutorials**
- **Java University Certification Training**
- **HOT** Industry-Leading Certification Programs
- **1 Day Mobile .NET Tutorial**
- **INFORMATIVE** Round Table Discussions
- Opening Day Welcome Reception
- SAMS Meet the Authors Hot Topics Lounge
- **COMPELLING** Case Studies & Best Practices
- **FEATURED** Product Demonstrations on the Show Floor
- **RIVETING** Real-time SYS-CON Radio Interviews

WHO SHOULD ATTEND

- **Software Developer**
- **Software Engineer**
- **Development Manager**
- **Application Developer**
- **Technical Director**
- **Analyst/Programmer**
- **IT Manager**
- **Technical Architect**
- **Team Leader**
- **Software Consultant**

Keynotes & Highlighted Speakers

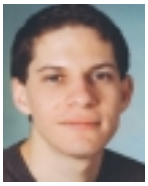
KEYNOTE SPEAKERS

John Magee
Vice President, Oracle9i

John Magee is vice president, Oracle9*i*, at Oracle. He has more than 14 years' experience in the enterprise software industry and has held positions in product development, product management, and product marketing. In his current role, Magee manages technical product marketing for Oracle's application server and development tools products, and is responsible for evangelizing Oracle technology initiatives around J2EE, XML, and Web services.

Mark Herring
Director Java, Web Services & Tools Business

Mark Herring is responsible for helping to define, set, and drive Sun Microsystems' product direction in the Java, Web Services & Tools Business. Prior to his current role, Herring was director of corporate strategy & planning, looking after Sun's interest in the Project Liberty Alliance and Network Identity. Herring joined Sun Microsystems in October 1999 as a result of Sun's acquisition of Forte Software. Forte Software was a leading provider of enterprise-class development and integration products. During his four years at the company, he ran several aspects of Forte's marketing organization, including product marketing and the Web channel.



Miguel de Icaza
Cofounder and CTO

As the founder and leader of the GNOME Foundation, Miguel de Icaza is one of the foremost luminaries in the Linux development community. With his seemingly boundless energy, de Icaza has galvanized the effort to make Linux accessible and available to the average computer user. He brings this same excitement to his role as CTO of Ximian. de Icaza was instrumental in porting Linux to the SPARC architecture and led development of the Midnight Commander file manager and the Gnumeric spreadsheet. He is also a primary author of the design of the Bonobo component model, which leads the way in the development of large-scale applications in GNOME.

Mark Hapner
Distinguished Engineer, Sun Microsystems

Mark Hapner is a Sun Distinguished Engineer and is currently lead architect for Java™ 2 Platform, Enterprise Edition (J2EE™). He has guided the overall architecture for J2EE 1.2, 1.3, and now the upcoming 1.4 release. In March of 1996, he joined Sun's JavaSoftware Division to participate in the development of the Java database connectivity API (JDBC). Following that, he was co-spec lead of the Enterprise JavaBeans specification and spec lead of the Java Message Service specification.

Simon Phipps
Chief Technology Evangelist, Sun Microsystems

Simon Phipps, currently chief technology evangelist at Sun Microsystems, speaks frequently at industry conferences on the subject of technology trends and futures. He was previously involved in OSI standards in the 1980s, in the earliest collaborative conferencing software in the early 1990s, and in introducing Java and XML to IBM.

Dave Chappell
VP, Chief Technology Evangelist, Sonic Software

Dave Chappell is the vice president and chief technology evangelist for Sonic Software. He has more than 18 years of industry experience building software tools and infrastructure for application developers, spanning all aspects of R&D, sales, marketing, and support services. Chappell has published in numerous technical journals, and is currently writing a series of contributed articles for *Java Developer's Journal*.

Eric Newcomer
Chief Technology Officer, IONA

In the role of chief technology officer at IONA, Eric Newcomer is responsible for IONA's technology roadmap and the direction of IONA's Orbix E2A e-Business Platforms as relates to standards adoption, architecture, and product design. Newcomer joined IONA in November 1999, and most recently served as IONA's vice president of engineering, Web Services Integration Products. He is a member of the XML Protocols and Web Services Architecture working groups at the W3C and IONA's Advisory Committee representative to UDDI.org.

Dean Guida
CEO and President, Infragistics

Dean Guida is CEO and president of Infragistics and was CEO and a cofounder of ProtoView Development Corporation. Mr. Guida has over 15 years of experience in the technical industry and oversees all aspects of the company's business operations and corporate direction. He is also responsible for cultivating strategic alliances and other external relationships, as well as managing corporate financial affairs.

Conference Advisory Board

Sean Rhody
Editor in Chief,
Web Services Journal
Partner, CSC

Alan Williamson
Editor in Chief,
Java Developer's Journal
Chief Technology Officer, n-ary

Derek Ferguson
Editor in Chief,
.NET Developer's Journal
Chief Technology Evangelist, Expand Beyond Corp.

Bob Familiar
.NET Architect,
Microsoft
New England

Thomas Robbins
Senior Technology Specialist,
Microsoft
New England

Hitesh Seth
Editor in Chief,
XML-Journal
Chief Technology Officer, ikigo

J.P. Morgenthal
Chief Services Architect,
Software AG

Conference at-a-Glance

THE LARGEST AND THE MOST

		JAVA	WEB SERVICES	.NET
TUESDAY MARCH 18	8:00AM – 4:00PM	Registration Open		
	9:00AM – 9:50AM	(JV1) Squeezing the Best Out of Java Alan Williamson, Java Developer's Journal	(WS1) Web Services Infrastructure Carl Sjogreen, BEA	(NT1) .NET Framework Overview Bob Familiar, Microsoft
	10:00AM – 10:50AM	Web Services Keynote: John Magee, Oracle		
	11:00AM – 11:50AM	(JV2) Testing Your Java Using JUnit Kyle Gabhart, LearningPatterns	(WS2) Web Services Management James Phillips, Actional	(NT2) Introduction to ASP.NET Russ Fustino, Microsoft
	1:00PM – 1:50PM	WS-I Panel: "A Road Map for Web Services Standards" - Moderated by Rob Cheng, WS-I		
	2:00PM – 2:50PM	.NET Keynote: "The MONO Project" - Miguel de Icaza, Ximian		
	3:00PM – 3:50PM	(JV3) Building/Deploying the Ant Way Kyle Gabhart, LearningPatterns	(WS3) Strategies for Using Databases in a World of Web Services Mike Lehmann, Oracle	(NT3) Introduction to VB.NET Russ Fustino, Microsoft
	4:00PM – 4:50PM	(JV4) Unlocking the Secrets of JDK1.4 Raghavan Srinivas, Sun Microsystems	(WS4) Using Web Services to Integrate J2EE and .NET Enterprise Applications - Odysseas Pentakalos, SYSNET International	(NT4) How to Develop an End-to End .NET Connected Appilication Allan da Costa Pinto, Microsoft
WEDNESDAY MARCH 19	8:00AM – 4:00PM	Registration Open		
	9:00AM – 9:50AM	(JV5) Java APIs for Web Services Security Standards Sang Shin, Sun Microsystems	(WS5) Combining BPM and BRM Technologies: A Major Step Towards Corporate Agility Henry Bowers, ILOG	(NT5) .NET: The Virtualized Execution Engine Yahya Mirz, Aurora Borealis
	10:00AM – 10:50AM	Java Keynote: Mark Herring, Sun Microsystems		
	11:00AM – 6:00PM	EXPO OPEN 11:00 a.m. - 6:00 p.m.		
	11:00AM – 11:50AM	(JV6)	(WS6) Web Services for Real-Time Data Access in an Industrial Setting Stephan Van Dijck, ABB/SKYVA	(NT6) Introduction to DotGNU Barry Fitzgerald, DotGNU
	12:00PM – 2:00PM	BREAK & EXPO		
	2:00PM – 2:50PM	.NET Panel Discussion - Moderated by Derek Ferguson, .NET Developer's Journal		
	3:00PM – 3:50PM	(JV7) Unlocking the Power of XML Hitesh Seth, ikigo	(WS7) Web Services Architecture: The Next Big Spec. from the Mouths of the W3C Eric Newcomer, IONA (moderator)	(NT7) Introduction to SSCLI Yahya Mirz, Aurora Borealis
	4:00PM – 4:50PM	(JV8) Java and .NET Derek Ferguson, Expand Beyond	(WS8) Web Services: Next Steps After the Hype Claire Dessaux, Oracle	(NT8) Mobile Development with the Compact Framework Brad Mccabe, Infragistics
THURSDAY MARCH 20	8:00AM – 4:00PM	Registration Open		
	9:00AM – 9:50AM	(JV9) Writing SOAP Services Nigel Thomas, SpiritSoft	(WS9) Web Services Best Practices Chris Peltz, HP	(NT9) Best Practices for .NET Development Joe Stagner, Microsoft
	10:00AM – 10:50AM	.NET Keynote - Jesse Liberty, Liberty Associates		
	11:00AM – 4:00PM	EXPO OPEN 11:00 a.m. - 4:00 p.m.		
	11:00AM – 11:50AM	(JV10) Working with Data the JDO Way Patrick Linsky, SolarMetric	(WS10) Web Services Startups: Telltales of the Future Simeon Simeonov, Polaris Venture Partners	(NT10) Best Practices for ADO.NET Development Thom Robbins, Microsoft
	12:00PM – 2:00PM	BREAK & EXPO		
	2:00PM – 2:50PM	Java Panel - "The Future of Java", Moderated by Alan Williamson, Java Developer's Journal		
	3:00PM – 3:50PM	(JV11) Enterprise: The Next Generation Mark Hapner, Sun Microsystems	(WS11) Open Standards for Web Services Messaging Dave Chappell, Sonic Software	(NT11) How to Debug with .NET Tony Denbow, STAR Information Technology
	4:00PM – 4:50PM	(JV12) Overcoming the Challenges of J2ME Dr. Jeff Capone, Aligo	(WS12) Web Services Security Marc Chanliau, Netegrity	(NT12) XML and Web-Enabling Legacy Applications Using BizTalk Mike Cramer, Microsoft

XML	VENDOR
(XM1) XML - A Manager's Guide JP Morgenthal, Software AG	Visit www.sys-con.com for details
(XM2) OASIS Standards Update Karl Best, OASIS	(VN2) The XMLSPY 5 Enterprise Edition Development Environment Trace Galloway, Altova
(XM3) A Definitive Introduction to XML Schemas Aaron Skonnard, DevelopMentor	(VN3) SOAP and Java: Marrying Them Off Skip Marler, Parasoft
(XM4) XML in Print - XSL:FO Frank Neugebauer, IBM	Visit www.sys-con.com for details
(XM5) XML Security Integration Challenges Phil Steitz, American Express	(VN5) Process-Centric Enterprises Eric Pulier, Digital Evolution
(XM6) Case Study: XML in Life Sciences Tim Matthews, Ipedo	(VN6) Pattern Driven Application Development Tom Shore, Compuware
(XM7) Using XML for EAI - Best Practices Dan Enache, TIBCO	(VN7) Managing the Developer Relationship Mike Bellissimo, Sun Microsystems
(XM8) Take XML with You: XML and Mobile Computing - Hitesh Seth, ikigo	(VN8) Web Services Diagnostics Dave Seidel, Mindreef
(XM9) XML, Ontologies and the Semantic Web - Ayesha Malik, Object Machines	Visit www.sys-con.com for details
(XM10) X Query Mike Champion, Software AG	(VN10) Model Driven Development of Web Services in UML for the J2ME Bill Graham, Rational Software
(XM11) XPath & XSLT 2.0 BEA Kurt Cagle, Cagle Communications	(VN11) Why Web Services Management? Jon Atkins, HP
(XM12) Third Generation XML Tools Michael Leventhal, Commerce One	Visit www.sys-con.com for details

JAVA UNIVERSITY℠ PROGRAM

Sun microsystems

9:00AM – 5:00PM

Web Services Programming Using Java™ Technology and XML

This one-day seminar provides in-depth knowledge on Web services and shows how to develop Web services using the Java programming language and XML, the technologies of portable code and portable data respectively.

Sun microsystems

9:00AM – 5:00PM

Java 2 Platform Programmer Certification Fast Path

This session, developed and delivered by Philip Heller, author of the two leading Java technology certification preparation manuals, helps to prepare you for the Sun Certified Programmer for the Java 2 Platform exam. Philip provides code-level, detailed review of the skills and knowledge needed to confidently approach the exam.

Sun microsystems

9:00AM – 5:00PM

Java 2 Platform Architect Certification Fast Path

This intense one-day session helps prepare attendees to pass the Sun Certified Enterprise Architect for J2EE Technology exam. This session provides an overview of the components comprising the J2EE architecture as a whole, emphasizes the incorporation of J2EE technology into an architecture, and reviews each of the certification exam's testing objectives.

FAST TRACKS & TUTORIALS

XML EDGE conference&expo

9:00AM – 5:00PM

XML Certified Developer Fast Path

This tutorial is for programmers who have some knowledge of XML and related technologies and would like to pass the IBM Certified Developer Test 141 on XML and Related Technologies.

Microsoft®

9:00AM – 5:00PM

Russ' Tool Shed

Join Russ as he shows you how to use Visual Studio.NET.

9:00-12:15 - Introduction to Web Services Using VS.NET

1:00-2:30 - Advanced Web Services Using ASP.NET

2:45-4:15 - .NET Remoting Essentials

RUSS' TOOLSHED TINKERING WITH VISUAL STUDIO

Microsoft .net

9:00AM – 5:00PM

Mobile .NET

In this session, Derek Ferguson, editor-in-chief of .NET Developer's Journal, will give you a thorough introduction to the use of .NET with all manner of mobile computing devices.

Java Technology Track

The Java track has been specifically designed to allow you to squeeze as much information out of each session as possible. This track is designed for the Java developer who wishes to catch up on the latest techniques and APIs and will be led by industry-leading speakers and authors.

The Java track has been designed with you, the more experienced Java developer, in mind. We know you don't have a lot of spare time, and we've designed the track to ensure that your time is maximized and you are armed with all the necessary tools to take your development to the next level.

(JV1) Squeezing the Best Out of Java

ALAN WILLIAMSON, JAVA DEVELOPER'S JOURNAL

Tuesday March 18, 2003 9:00 A.M. - 9:50 A.M.

Java is a very powerful language, and while it offers the developer a rich array of tools, the fundamentals should not be overlooked. Improving your code at the core layer will result in great improvements in efficiency and fewer bugs. We'll look at the dos and don'ts of programming and learn lots of hints and tips that will accelerate your Java coding.

BIO: Alan Williamson is editor-in-chief of *Java Developer's Journal*. In his spare time, he holds the post of chief technical officer @ n-ary (consulting) Ltd, one of the first companies in the UK to specialize in Java at the server side. Reach him at alan@n-ary.com (http://www.n-ary.com). Rumor has it he welcomes all suggestions and comments!

(JV2) Testing Your Java the JUnit Way

KYLE GABHART, LEARNINGPATTERNS

Tuesday March 18, 2003 11:00 A.M. - 11:50 A.M.

A critical measure of the success of software can be found in whether or not it executes successfully. Equally important, however, is whether or not that software does what it was intended to do. JUnit is an open-source testing framework that provides a simple means for developers to define their intentions for how their software should work. JUnit then provides test runners that process your intentions and verify that your code performs as intended. The result is software that not only works, but works in the correct way.

BIO: Kyle Gabhart is a senior mentor for LearningPatterns, a dynamic knowledge company providing consulting, training, and mentoring in emerging technologies. He is a prolific writer, with more than two dozen technical articles and books to his name. Kyle is highly regarded as a dynamic and enthusiastic public speaker with an innovative perspective on technology.

(JV3) Building/Deploying the Ant Way

KYLE GABHART, LEARNINGPATTERNS

Tuesday March 18, 2003 3:00 P.M. - 3:50 P.M.

A defined and easily repeatable process is one of the most necessary but often least-used aspects of good software development. A defined build process ensures that your project's software is built, deployed, and tested identically each time. Without this type of control and predictability, valuable time is often lost chasing down bugs that don't exist or rejecting solutions that were only partially implemented.

Apache's Ant is a powerful scripting tool that enables developers to define and execute routine software development tasks using the simplicity and extensibility of XML. Ant provides a comprehensive mechanism for managing software development projects, including compilation, deployment, testing and execution. Additionally, it is compatible with any IDE or operating system.

BIO: Kyle Gabhart is a senior mentor for LearningPatterns, a dynamic knowledge company providing consulting, training, and mentoring in emerging technologies. He is a prolific writer, with more than two dozen technical articles and books to his name. Kyle is highly regarded as a dynamic and enthusiastic public speaker with an innovative perspective on technology.

(JV4) Unlocking the Secrets of JDK 1.4

RAGHAVAN SRINIVAS, SUN MICROSYSTEMS

Tuesday March 18, 2003 4:00 P.M. - 4:50 P.M.

With the release of JDK 1.4, a number of new features were added to the core API, such as nonblocking IO, regular expressions, assertions, and XML. This session will take you through the major additions and demonstrate where you might use them.

BIO: Raghavan Srinivas is a Java technology evangelist at Sun Microsystems who specializes in Java and distributed systems. He has spoken on a variety of technical topics at conferences around the world, and brings with him more than 15 years of software development experience. Prior to joining Sun, Raghavan worked for Digital Equipment Corporation. He has worked in several technology areas, including internals of VMS, UNIX, and NT.

(JV5) Java APIs for Web Services Security Standards

SANG SHIN, JAVA TECHNOLOGY EVANGELIST, SUN MICROSYSTEMS

Wednesday March 19, 2003 9:00 A.M. - 9:50 A.M.

Everybody is talking about Web services as a way to perform business transactions over the Web in ways never done before. Yet, security is the most critical piece that still needs to be addressed before the promise of Web services can be realized. This session introduces the various Web services security standards, such as XML signature, XML encryption, XKMS (XML Key Management Services), XACML (eXtensible Access Control Markup Language), SAML (Security Assertion Markup Language), WS-Security, and Liberty First and their corresponding Java APIs, especially the standards APIs that are currently being defined through the Java Community Process (JCP). Wherever possible, example code will be presented.

BIO: Sang Shin has been with Sun Microsystems for over 12 years, working in various research and engineering projects mostly in data communication, networking, Internet, and Java-related areas. Prior to Sun, he worked in several startup companies in various engineering and managerial capacities. He currently teaches two graduate-level software engineering courses (XML, Distributed programming using Jini networking technology) in Brandeis University's continuing education program in Massachusetts.

(JV6) To Not Swing Is to SWT! The Swing Alternative

IBM CORE ENGINEER

Wednesday March 19, 2003 11:00 A.M. - 11:50 A.M.

With the release of Eclipse, IBM has been quietly promoting the power and performance benefit of SWT over and above Swing. Discover what all the noise is about SWT and how it can accelerate your client experience.

(JV7) Unlocking the Power of XML

HITESH SETH, ikigo

Wednesday March 19, 2003 3:00 P.M. - 3:50 P.M.

There is more to XML than just one block of String. Understand the difference between a DTD and a schema and the APIs you can utilize within Java that will bring the power of XML to your Java development.

BIO: Hitesh Seth is the chief technology officer of ikigo, Inc., a provider of XML-based Web services monitoring and management software. A freelance author and well-known speaker, he regularly writes for technology publications on VoiceXML, Web services, J2EE and Microsoft .NET, wireless computing, and enterprise/B2B integration. He is also the editor-in-chief of *XML-Journal*.

(JV8) Integrating Java and .NET

DEREK FERGUSON, EXPAND BEYOND CORPORATION

Wednesday March 19, 2003 4:00 p.m. - 4:50 p.m.

Two technologies that aren't often mentioned in the same breath are Java and Microsoft. However, it is the rare developer who is able to completely avoid either of these two worlds nowadays. In this presentation, we will examine several tools both free and commercial that can be used to bring these two development platforms together. Some knowledge of Java and Windows development is advisable.

BIO: Derek Ferguson is chief technology evangelist for Expand Beyond Corporation (www.xb.com), the worldwide leader in mobile software for enterprise management. He is also editor-in-chief of *.NET Developer's Journal* and author of the book *Mobile .NET*.

(JV9) Writing SOAP Services

NIGEL THOMAS, SPIRITSOFT, INC.

Thursday March 20, 2003 9:00 A.M. - 9:50 A.M.

J2EE 1.4 mandates the use of JMX to manage compliant products. Early adopters of JMX mostly use protocols like RMI and HTTP to communicate between the management application and the agents it is managing. This presentation describes how JMS is utilized to manage large deployments of managed agents in the Enterprise and optimize the delivery of alerts and notifications in complex environments. The processing of management alerts, using open source components (such as Jelly) to provide an Event-Condition Action (ECA) framework, will also be discussed.

BIO: Nigel Thomas joined SpiritSoft as director of product marketing in April 2001. Prior to SpiritSoft, Nigel spent five years with EAI pioneer Constellar, serving in consulting, support, sales support, and development roles. He became product architect and then director of product management for the flagship Constellar Hub product. Nigel spent over eight years at Oracle, architecting and delivering Oracle's Accounting products and then moving on to worldwide performance consulting and CASE development assignments.

(JV10) Working with Data the JDO Way

PATRICK LINSKEY, SOLARMETRIC

Thursday March 20, 2003 11:00 A.M. - 11:50 A.M.

Java Data Objects is an alternative way of looking at your data compared to JDBC. Looking at your data in an object-oriented way offers many advantages over the sequential manner of JDBC. Learn how JDO can be adopted for your own requirements through practical examples.

BIO: Patrick Linskey manages and drives SolarMetric's technology development as vice president of Engineering. Patrick has been intimately working with JDO for nearly two years and has been involved in object/relational mapping for over four years. Over the past year, Patrick has evangelized the JDO specification at local Java User Groups and software symposiums throughout the world.

(JV11) Enterprise: The Next Generation

MARK HAPNER, SUN MICROSYSTEMS

Thursday March 20, 2003 3:00 P.M. - 3:50 P.M.

With the latest release of the J2EE 1.4 framework, a whole new suite of APIs have been added to this already comprehensive edition. Chances are, there are goodies lurking in there you didn't even know about. This session will take a look at unearthing some of the gems of the J2EE framework.

BIO: Mark Hapner is a Sun Distinguished Engineer and is currently lead architect for Java™ 2 Platform, Enterprise Edition (J2EE™). He has guided the overall architecture for J2EE 1.2, 1.3 and now the upcoming 1.4 release. In March of 1996, he joined Sun's JavaSoftware Division to participate in the development of the Java database connectivity API (JDBC). Following that he was co spec lead of the Enterprise JavaBeans specification and spec lead of the Java Message Service specification.

Prior to his work on Java enterprise APIs, Mark was a member of Sun's Object Services Group were he wrote several of Sun's initial CORBA object services submissions and worked on the integration of object oriented and relational databases with Sun's ORB.

(JV12) Overcoming the Challenges of J2ME

DR. JEFF CAPONE, ALIGO

Thursday March 20, 2003 4:00 P.M. - 4:50 P.M.

J2ME has brought the power of Java to the mobile space. However, it is fair to note that not all the JDK is available to you. Discover what is and what isn't available to you and how you can potentially work around some of what seems to be "must have" tools.

BIO: Dr. Jeff Capone has devoted his career to researching wireless and wireline networks and applications. As Aligo's CTO, Jeff leads the technology development and is the principal architect of the innovative M-1 Server. Prior to leading Aligo's engineering team, he was an assistant professor at Arizona State University and director of the Network Engineering and Wireless Telecom Lab.

Web Services Track

The Web Services track focuses on issues and topics that are at the forefront of development efforts in Web services. Although the current specifications provide a minimum set of protocols, issues such as security, transaction management, service management and coordination remain in flux. This track presents some of the leading authorities in the field on these urgent topics and addresses all of the questions that currently concern designers, developers and consumers of Web services

(WS1) Web Services Infrastructure

CARL SJOGREEN, BEA

Tuesday March 18, 2003 9:00 A.M. - 9:50 A.M.

Web services have evolved from an over-hyped vision of an interconnected world to a set of real standards and technologies that can solve real-world problems in the enterprise. Building, deploying, and managing Web services in an enterprise-class environment, however, still raises many questions about the infrastructure on which those Web services are deployed.

This session will introduce several real-world Web services case studies, the requirements placed on Web services infrastructure, and several hands-on examples of enterprise-class Web services implementations that address the issues raised above.

BIO: Carl Sjogreen is product manager for BEA WebLogic Workshop, BEA's latest Java innovation and an integrated development environment for building Web services. He has been involved with XML, Web services, and developer tools since 1998, when he founded Transformis, a software startup specializing in XML tools. Passionate about the power of XML and bringing new technologies to the masses, he is a key contributor to growing the BEA WebLogic development community.

(WS2) Web Services Management

JAMES PHILLIPS, ACTIONAL

Tuesday March 18, 2003 11:00 A.M. - 11:50 A.M.

Service-oriented architectures (SOAs) have been held out for years as a substantially more cost-effective and flexible approach to architecting enterprise software systems than historical strategies such as monolithic system design or tightly coupled client/server approaches. Many customers and industry observers believe Web services technology finally makes possible the widespread adoption of the SOA approach. But while Web services and SOAs substantially ease the application development and integration burden, they bring with them a new collection of management challenges. In this session, you will learn about the essential management criteria for growing and sustaining a "mission-critical" service-oriented architecture.

BIO: In his role at Actional, James has worldwide responsibility for Actional's product and market strategy and market execution. Prior to joining Actional, he served as CSO and vice president of product marketing and business development with Ensim Corporation. James is a frequent speaker and editorial contributor on Web services–related issues and serves on the international advisory board of *Web Services Journal*.

(WS3) Strategies for Using Databases in a World of Web Services

MIKE LEHMANN, ORACLE

Tuesday March 18, 2003 3:00 P.M. - 3:50 P.M.

Databases continue to be at the core of most IT infrastructures yet the knowledge of how they play in the world of SOAP-based Web services is less well understood. This presentation covers strategies for publishing database components as Web services and, as important, techniques for consuming Web services within databases. Find out how to plug your database infrastructure into the world of Web services.

BIO: Mike Lehmann has worked in the IT industry for over 12 years as a developer, consultant, and project manager in emerging technologies. His current areas of focus include J2EE and Web services. Mike frequently authors articles and papers on Web services and speaks regularly at industry events.

(WS4) Using Web Services to Integrate J2EE and .NET Enterprise Applications

ODYSSEAS PENTAKALOS, PH.D., SYSNET INTERNATIONAL, INC.

Tuesday March 18, 2003 4:00 P.M. - 4:50 P.M.

The Web services phenomenon promises to resolve all interoperability issues through an open architecture that is based on widely accepted industry standards such as SOAP, WSDL, and HTTP. This session will explore component reuse across the two major enterprise application platforms, J2EE and .NET, using Web services as the medium of interaction. Through examples, this tutorial will cover the current state of interoperability between J2EE and .NET and will focus on best practices and issues that arise. The Axis SOAP implementation will be used in this session as the Web services platform for exposing J2EE components.

BIO: Odysseas Pentakalos is vice president of SYSNET International, Inc., where he focuses on architecture, design, and development of large distributed systems that utilize Java and J2EE technologies. He holds a Ph.D. in computer science, is the author of the *Windows 2000 Performance Guide*, has published over two dozen papers in conference proceedings and journals, and is a frequent speaker at industry conferences.

(WS5) Combining BPM and BRM Technologies: A Major Step Towards Corporate Agility

HENRY BOWERS, ILOG

Wednesday March 19, 2003 9:00 A.M. - 9:50 A.M.

Corporate agility: the ability to quickly respond to unexpected change inside and outside the corporation, is a coveted quality of the modern enterprise. This presentation discusses how corporate agility is driven by technical agility. It introduces business rule management (BRM), business process management (BPM), and Web Services technologies, and explains how together these technologies provide an enabling foundation for technical agility.

BIO: Henry Bowers has spent more than 15 years in the high-tech sector, building and managing software products for both private industry and government. He has more than 7 years' experience working with rules-based systems and business rules in general. Henry is currently a product manager for business rules at ILOG.

(WS6) Web Services for Real-Time Data Access in an Industrial Setting

STEPHAN VAN DIJCK, ABB/SKYVA

Wednesday March 19, 2003 11:00 A.M. - 11:50 A.M.

Real-time processes deliver and require data in order to participate in business transactions. We will present an application under development at ABB for linking real-time process control with business processes via Web services, and explore how plant floor control can be a consumer and producer of Web services. We will use solutions from ABB, IBM WebSphere, and Microsoft .NET.

BIO: Stephan Van Dijck holds a master's degree in engineering mechanics from K.U. Leuven, Belgium, and a degree in business management from I.A.G. U.C., Louvain, Belgium. He has worked as a process engineer at the EXXON facility in Antwerp, Belgium, where he supervised logistics planning and optimization of loading and unloading operations with Honeywell Europe as an application and software development manager, product line marketing manager for Batch control systems, and marketing manager for the chemicals and pharmaceuticals business unit Europe. In 1998 he joined SKYVA, a provider of e-manufacturing solutions by making use of Web services.

(WS7) Web Services Architecture: The Next Big Spec, from the Mouths of the W3C Authors

ERIC NEWCOMER, IONA (MODERATOR)

Wednesday March 19, 2003 3:00 P.M. - 3:50 P.M.

The World Wide Web Consortium (W3C) was created to develop interoperable technolo-

gies and to provide an open forum for discussion about the future of the Web. A significant effort currently underway within the W3C's Web Services Activity is the development of a Web Services Architecture Specification to help guide the future direction of Web services.

This panel session will discuss the role of the W3C in the development of Web services standards through this effort. The panel includes cochairs of the working group and editors of the spec, with representatives from BEA Systems, Contivo, IBM, IONA, and Software AG. Providing conference attendees with an opportunity to learn more about what the W3C is doing with regard to Web services, this panel will demonstrate the benefits and examine the challenges of working together to develop an open standard architecture.

BIO: In the role of chief technology officer at IONA, Eric is responsible for IONA's technology roadmap and the direction of IONA's Orbix E2A e-Business Platforms as relates to standards adoption, architecture, and product design. Eric joined IONA in November 1999, and most recently served as IONA's vice president of engineering, Web Services Integration Products. Eric is a member of the XML Protocols and Web Services Architecture working groups at the W3C and IONA's Advisory Committee representative to UDDI.org.

(WS8) – Web Services: The Next Steps After the Hype

CLAIRE DESSAUX, ORACLE

Wednesday March 19, 2003 4:00 P.M. - 4:50 P.M.

Because Web services are still very new, many companies have yet to understand what Web services mean for their line of business and how they can make the most of this evolutionary technology. This session will highlight real-life examples where Web services have been successfully implemented and examines where services make sense, especially as they relate to integration. It will conclude with recommendations on how to best plan for a Web service strategy.

BIO: Claire Dessaux joined Oracle Alliances in 1994 with a main focus on helping partners implementing Oracle technology. Since then she has worked in various capacities on the incorporation of J2EE, XML and Web services into Oracle's product lines.

(WS9) Best Practices for Web Services Development

CHRIS PELTZ, HP

Thursday March 20, 2003 9:00 A.M. - 9:50 A.M.

There has been a fair amount of hype around Web services and the benefits they can bring to an organization. For many, it is difficult to determine how to best get started with Web services. This talk will outline a number of first steps that can be taken to begin planning a Web services pilot. It will also address a series of design guidelines, patterns, and architectural recommendations to enable an organization to build robust, flexible, and secure services. The talk will conclude with a look at tips and techniques for developing, testing, and managing Web services.

BIO: Chris Peltz is a senior software consultant within HP's Developer Resources Organization. He provides technical and architectural consulting to enterprise customers on J2EE, Web services, and mobile development. Chris has over 10 years of software experience in object-oriented technologies, 4GL development, GIS, and Web applications design.

(WS10) Web Services Startups: Telltales of the Future

SIMEON SIMEONOV, POLARIS VENTURE PARTNERS

Thursday March 20, 2003 11:00 A.M. - 11:50 A.M.

You must have seen them; they're everywhere. Web services startups are popping up like mushrooms after rain. Or has the Web services hype created a microcosm of startup activity that is going to mirror the boom and bust cycle of the late '90s? As a Web services technologist, where should you focus your energies? As a customer, how should you choose your vendor? As an investor, where should you put your money to work? In this presentation you'll get an overview of startup activity in the Web services space within the context of emerging industry dynamics and evolving customer needs. We will cover Web services tools, appliances, runtimes, integration, security, testing, and management.

BIO: Simeon Simeonov is a principal at Polaris Venture Partners, a leading early-stage venture firm, where he focuses on investments in information technology. Prior to joining Polaris, Sim was chief architect and vice president of emerging technologies at Macromedia, where he led the development of Web services technologies and platform infrastructure for next-generation Internet applications. Prior to that, he was a founding member and chief architect at Allaire, where he was responsible for the ColdFusion application server and cross-product technology strategy.

(WS11) Open Standards for Web Services Messaging

DAVE CHAPPELL, SONIC SOFTWARE

Thursday March 20, 2003 3:00 P.M. - 3:50 P.M.

Web services hold the promise of driving down the cost and complexity of application integration both between internal systems and between business partners. But unless Web services communications are made reliable, organizations will not be able to trust them for mission-critical operations, such as complex business-to-business transactions or real-time enterprise integration.

In this session, Dave Chappell, a coauthor of the WS-Reliability specification, will examine the emerging Web services reliability standards, including a detailed discussion on WS-Reliability, a new specification for open Web services messaging.

BIO: Dave Chappell, vice president and chief technology evangelist for Sonic Software, has over 18 years of experience in the software industry covering a broad range of roles including R&D, code-slinger, sales, support, and marketing. Dave has a strong passion for shaping the future of technology and enjoys sharing his knowledge and experience with others.

(WS12) – Web Services Security

MARC CHANLIAU, NETEGRITY

Thursday March 20, 2003 4:00 P.M. - 4:50 P.M.

Web services deployments typically use transport-level security for authentication and application-based access control for authorization. This presentation shows the limitations of transport-level security and introduces the XML technologies that complement the transport-level approach to provide a secure authentication solution. This presentation also covers the issues involved in providing access control in back-end applications and suggests a better, centralized approach to abstract authorization information out of back-end applications and into a single point of control using XML-based query technologies.

BIO: Marc Chanliau is a product manager for Netegrity, Inc. He has been in the software industry for over 20 years in many different capacities. Marc started the OASIS Security Services Technical Committee which culminated in the adoption of SAML as an official OASIS standard in November 2002. He holds an MS in linguistics from the University of Paris-Jussieu, France.

Microsoft .NET Track

Microsoft .NET represents a major evolution in how applications are developed, deployed, and managed on the Microsoft platform. The .NET Framework gives developers an object-oriented development environment for building all types of applications, including desktop, client/server, dynamic Web page, wireless devices, server-based as well as complete support for XML Web services and the related XML standards. The sessions in the .NET Track will give you a broad as well as deep understanding of the capabilities in the .NET Framework and how applications built on .NET are easily integrated with applications running in heterogeneous environments, including mainframe, UNIX, and J2EE platforms.

(NT1) .NET Framework Overview

BOB FAMILIAR, MICROSOFT

Tuesday March 18, 2003 9:00 A.M. - 9:50 A.M.

This session will introduce the architecture and technologies within the .NET Framework, including the Common Language Runtime, ASP.NET, and ADO.NET, as well as XML and SOAP support. Integration with COM and COM+ services will be covered, as well as a discussion of the .NET Framework SDK.

BIO: Bob Familiar is a Microsoft Architectural Engineer and Certified Microsoft Solution Developer with over 14 years of experience in software engineering. He has developed solutions in C, C++, Java, SQL, and Visual Basic, and has over 7 years of experience using Microsoft Development Tools. Bob holds a patent for technology that maps relational database tables to object-oriented software components. His current areas of interest include object oriented analysis and design of distributed object models and distributed computing using COM+.

(NT2) Introduction to ASP.NET

RUSS FUSTINO, MICROSOFT

Tuesday March 18, 2003 11:00 A.M. - 11:50 A.M.

We will look at the next version of Active Server Pages, ASP.NET, a major upgrade to the current version of ASP. Xcopy deployment; control-based encapsulation; clean separation of code from HTML; strongly typed, compiled languages; and event-based page processing will change the way you develop UI for server-based Web applications. This session covers the ASP.NET Page Framework from the ground up: architecture; ASP.NET syntax; server controls; control families: intrinsic controls, list controls, and rich controls. Finally, this session will cover business objects, Web services, and migration issues.

BIO: Russ Fustino is a Microsoft Principal Technology Specialist and a Microsoft Certified Professional with over 20 years of software development experience. He has an expertise in developing Visual Basic and Web-based solutions using Microsoft tools. Prior to Microsoft, Russ was a VB instructor, headed up a development department and created several client/server application and system software products. Russ's specialties include development with VB.NET, XML Web services, ASP.NET, and debugging.

(NT3) Introduction to VB.NET

RUSS FUSTINO, MICROSOFT

Tuesday March 18, 2003 3:00 P.M. - 3:50 P.M.

Looking to learn the latest release of Visual Basic, VB.NET? Wait no longer and jump right in! See first hand why VB is the language of choice for developers. Whether you are changing from another language or just re-tooling, make sure you hit this session. You won't regret it! We will cover the Visual Studio Integrated Development Environment, Win Forms, Web forms and ASP.NET, classes and objects, XML Web services, ADO.NET introduction for data access and debugging.

BIO: Russ Fustino is a Microsoft Principal Technology Specialist and a Microsoft Certified Professional with over 20 years of software development experience. He has an expertise in developing Visual Basic and Web-based solutions using Microsoft tools. Prior to Microsoft, Russ was a VB instructor, headed up a development department, and created several client/server application and system software products. Russ's specialties include development with VB.NET, XML Web services, ASP.NET, and debugging.

(NT4) How to Develop an End-to-End .NET-Connected Application

ALLAN DE COSTA PINTO, MICROSOFT

Tuesday March 18, 2003 4:00 P.M. - 4:50 P.M.

This session will show you how to design and create a sample application using multiple Microsoft .NET Enterprise Server products. We will show you how to integrate .NET technologies into an effective solution. The following products and technologies will be covered in this session: VS.NET, ASP.NET, VB.NET, C#, XML Web services, BizTalk, and SQL Server 2000. (Note: The demos in this session have been updated for VS.NET RTM version.)

BIO: Allan da Costa Pinto is a Microsoft Certified Application Developer for .NET and works for Microsoft Consulting in the Connecticut Area. Allan focuses on architecting and building solutions using Microsoft Visual Studio® .NET and XML Web services.

(NT5) .NET, the Virtualzed Execution Engine

YAHYA MIRZ, AURORA BOREALIS

Wednesday March 19, 2003 9:00 A.M. - 9:50 A.M.

With .NET, Microsoft has introduced a major evolution in their computing platform. At the core of .NET, is a language agnostic runtime, currently being standardized by ECMA. This effort is called the Common Language Infrastructure or the CLI. The objective of this presentation will be to provide insight into the design decisions that led to the CLI's Execution Engine and their rationale. Additionally, I will explain through an example, how a component works it's way through the Virtualized Execution Engine of the CLI.

BIO: Yahya Mirza is striving to balance commercial development with component-based language research. Since 1999, Mr. Mirza has been working on .NET projects at Microsoft, Source Dynamics and Safeco Life. His passion lies in language design for music and computer animation.

(NT6) Introduction to DotGNU

BARRY FITZGERALD, DOTGNU

Wednesday March 19, 2003 11:00 A.M. - 11:50 A.M.

This session will feature a brief overview of the many GNU projects currently implementing and extending ECMA CLI standards. These projects include SEE, phpGroupWare, Portable.NET, Web Services, and Virtual Identities.

BIO: Barry Fitzgerald is one of the cofounders of the DotGNU Free Software Project to create a 100% open source GNU implementation of the ECMA Common Language Infrastructure (CLI). He is also a member of the Steering Committee for DotGNU.

(NT7) Intro to SSCLI

YAHYA MIRZ, AURORA BOREALIS

Wednesday March 19, 2003 3:00 P.M. - 3:50 P.M.

In early 2002, Microsoft released a "Shared Source" implementation of the .NET

Common Language Infrastructure available on BSD UNIX, Linux, Mac OSX, and the Windows platform codenamed "Rotor". For enthusiasts, Rotor provides an opportunity to understand the .NET technology at a deeper level. For language designers, Rotor can serve as an effective runtime core for experimentation at the language feature level. For compiler and virtual machine researchers, Rotor provides a context for applied research into alternative object representations, method dispatch, garbage collectors, JIT compilers, etc. My goal will be to provide an introduction into the Rotor code base.

BIO: Yahya Mirza is striving to balance commercial development with component-based language research. Since 1999, He has been working on .NET projects at Microsoft, Source Dynamics and Safeco Life. His passion lies in language design for music and computer animation.

(NT8) Mobile Development with the Compact Framework

BRAD MCCABE, INFRAGISTICS

Wednesday March 19, 2003 4:00 P.M. - 4:50 P.M.

With the release of the Compact Framework, Microsoft has brought mobile development to the masses. In this session we will look at some of the differences and similarities between the .NET Framework and the Compact Framework. We will also examine the consideration that must be factored into the architecture and development of mobile application such as dealing with user interface considerations and effective mobile data strategies

BIO: Prior to joining Infragistics, Brad McCabe served as systems architect for the network solutions development team at Verizon Communications. Concurrently, Brad held the position of lead .NET Evangelist within Ajilon Consulting and was responsible for content and delivery of material for the national Inside .NET tour. Brad has been working as a senior developer and a software engineer, and his current responsibilities include developing reference applications and working with enterprise customers on project implementation.

(NT9) Best Practices for .NET Development

JOE STAGNER, MICROSOFT

Thursday March 20, 2003 9:00 A.M. - 9:50 A.M.

This advanced session covers the wide array of best practices for the most productive .NET development topics. We'll start with an overview of design guidelines for .NET, ensuring that developers write consistent, predictable code that integrates well between languages. We will cover memory management and the garbage collector as well as the best methods for cleaning up unmanaged resources. A section will cover how to best use ADO.NET to access relational data, and how to assimilate that data with the .NET XML classes. We'll look at tips for creating both components and controls, how to best use the System.NET classes to access HTTP responses, the .NET threading model, and key security concepts will also be examined.

BIO: Joe Stagner is a technical evangelist of Developer Technologies at Microsoft, and has been developing software for 25 years, on Microsoft platforms since DOS 1.0. Joe currently focuses on helping Microsoft's Independent Software Vendors make the most of .NET Developer technologies and also works with medium business developers and the academic community in New England.

(NT10) Best Practices for ADO.NET Development

THOM ROBBINS, MICROSOFT

Thursday March 20, 2003 11:00 A.M. - 11:50 A.M.

One of the biggest changes in data access recently is that common clients and servers on the Internet work in a disconnected, stateless fashion. ADO.NET provides an optimized, XML-based framework for data access in a disconnected environment. With the advent of XML, programming for data access and manipulation, the mechanism is changing from a relational to a hierarchical form. ADO.NET classes read and write XML at their core. The ADO.NET framework fully supports disconnected reads and writes. and we'll discuss the performance implications of this as well as how to use different types of objects in their various states. ADO.NET also has classes that provide optimized performance with SQL Server or other OLE DB data sources. This session covers the best practices on how to handle data access for best performance, error handling, transaction support, and security. We'll discuss the best practices for retrieving, single item, single row and multiple rows of data as well as transaction handling, and look at examples of the performance differences in using DataReaders versus DataSets This session will also cover the best ways to cache data from data sources and the transformation to XML.

BIO: Thom Robbins is a senior technology specialist with Microsoft. He is a frequent contributor to various magazines include *.NET*, *Visual Studio.NET* and the *Web Services Journal*. Thom is also a frequent speaker at a variety of events that include VS Live and others. When not writing code and helping customers, he spends his time with his wife at their home in New Hampshire.

(NT11) How to Debug with .NET

TOBY DENBOW, STAR IT

Thursday March 20, 2003 3:00 P.M. - 3:50 P.M.

This session shows how the rules for debugging have completely changed with the advent of Microsoft .NET Framework. It will cover the core debugging concepts using the Microsoft .NET Framework. In addition, this session will discuss many advanced features that allow you to write better diagnostic and error-handling code.

BIO: Toby Denbow is VP of technology at STAR Information Technology. He has been a featured speaker at several Microsoft and industry trade shows. Toby has been working with .NET for over a year and was trained directly by the .NET developers in Redmond. He works with a wide variety of customers in various emerging technologies and has personally trained over 500 developers on Visual Studio.NET.

(NT12) XML and Web-Enabling Legacy Applications Using BizTalk

MIKE CRAMER, SENIOR PRINCIPAL TECHNOLOGY SPECIALIST, MICROSOFT

Thursday March 20, 2003 4:00 P.M. - 4:50 P.M.

This session examines how to integrate legacy line-of-business applications using BizTalk 2000 Server. It will examine BizTalk Server tools that allow you to create the components necessary to interface to legacy systems. This includes a scenario with four phases that demonstrates integration by using industry-standard XML and EDI file formats, delimited and positional files, and COM bridges.

BIO: As a member of the New England BSG Team and focusing on integrating heterogeneous applications, Mike Cramer works with existing and prospective Microsoft customers in New England on adopting the .NET platform. Mike joined Microsoft during the 1995 acquisition of Netwise Inc. (Boulder, CO). Prior to the acquisition, Mike worked for Netwise for approximately three years as a consultant and later consulting manager.

XML Technology Track

Whether you're looking to understand different XML standards, application techniques, or development tools; or using XML to develop the next generation of Web applications and services, the XML Track is your ultimate training, collaboration, and innovation ground. Sessions include fast-track, in-depth training on XML Schemas and XSL-FO. We will update you on standards development and offer a comprehensive review of the various technologies related to XML that are essential for today's IT manager. The XML Track is armed with real-world applications of XML in financial services, life sciences, enterprise and B2B integration, and mobile computing. We will discuss new developments around XForms, a recent W3C Standard which marks another era of standards-based application development; XPath and XSLT 2.0 XML; and Query.

The XML Track explores the technology and standards, real-world applications, and trends which will set the course for the future.

(XM1) XML: A Manager's Guide

JP MORGENTHAL, SOFTWARE AG

Tuesday March 18, 2003 9:00 A.M. - 9:50 A.M.

This session will provide an essential introduction to XML from a manager's perspective. As more and more IT projects utilize XML and its derivatives as fundamental technologies, it is key for today's manager to be aware of the various ingredients of XML. From core XML processing, transformation, metadata definition and schemas, applications in Web, wireless and speech applications, Web services, industry-standard vocabularies, and more, the session will offer a comprehensive review of the various technologies related to XML that today's IT Manager must be aware of.

BIO: JP Morgenthal serves as the chief services architect for Software AG, Inc. He is an internationally prominent authority on XML with more than 15 years of experience designing, developing, and analyzing software and technology. In his role as chief services architect, JP will explore and manage the design of complete professional services solutions based on Software AG technology and partner products in existing and emerging industries.

(XM2) OASIS Standards Update

KARL F. BEST, OASIS

Tuesday March 18, 2003 11:00 A.M. - 11:50 A.M.

OASIS is a not-for-profit, global consortium that drives the development, convergence, and adoption of e-business standards. Members of OASIS are providers, users, and specialists in standards-based technologies, and include organizations, individuals, and industry groups. The OASIS standards process can best be described as open, lightweight, and independent.

This session will address, OASIS Initiatives, current TC status,OASIS Technical Agenda, collaborative work at OASIS, EbXML, ISO/IEC/ITU/ECE Memorandum of Understanding (MoU) for electronic business, standards, liaison memberships in various ISO TCs and ISO/IEC JTC1 SCs and more ongoing, sponsor of Interoperability Summit, vendors submit specs to OASIS, dot-orgs move to OASIS, convergence at OASIS, and current Technical Committees,

BIO: Karl F. Best is the director of technical operations for OASIS, where he is responsible for managing the consortium's industry standards efforts. He is a former chief strategy officer and board member of the consortium, and has been involved in the XML/SGML industry since the early 1990s. Karl has been a member of a number of industry standards committees for SGML, XML, and associated standards, and a speaker at many industry conferences. He was previously employed by Novell, Adobe, and Sun Microsystems, designing and implementing electronic documentation systems.

(XM3) A Definitive Introduction to XML Schemas

AARON SKONNARD, DEVELOPMENTOR

Tuesday March 18, 2003 3:00 P.M. - 3:50 P.M.

XML Schema adds type information to XML-based data and goes beyond the functionality of traditional DTDs. This session starts with an introduction to XML Schema basics including data types – defining both simple types and basic complex types. We will explore the more advanced features in the XML Schema definition language, including how to derive complex types by extension or restriction and how to take advantage of type-based substitution. Also, we'll preview how XML Schemas are used in today's XML infrastructure.

BIO: Aaron Skonnard is a developer, instructor, and course author at DevelopMentor, where he focuses on the XML and Web services curriculum. He coauthored *Essential XML Quick Reference* and *Essential XML* (both published by Addison Wesley). Aaron also writes the "XML Files" for *MSDN Magazine*. Other writing projects include DevelopMentor's online XML tutorial as well as Microsoft's XML Resource Kit CD.

(XM4) XML in Print: XSL-FO

FRANK NEUGEBAUER, IBM

Tuesday March 18, 2003 4:00 P.M. - 4:50 P.M.

Today developers frequently use XSLT to convert XML into markup languages such as HTML. XSL Formatting Objects (XSL-FO) promises to abstract the details of rendering and allow developers to specify the layout and semantic properties of presentation regardless of rendering. This presentation will provide a thorough introduction to XSL-FO and how it relates to the other XML processing standards and will highlight the benefits of XSL-FO in XML application development. Using demonstrations, the session will highlight the features that XSL-FO provides for creating an open standards–based print process and its applications.

BIO: Frank Neugebauer is a consultant in the Insurance Solutions division of IBM Global Services, specializing in distributed Java solutions based on IBM's Insurance Applications Architecture (IAA). He is also a freelance writer and has contributed several articles to leading industry publications.

(XM5) XML in Financial Services

PHIL STEITZ, AMERICAN EXPRESS

Wednesday March 19, 2003 9:00 A.M. - 9:50 A.M.

This session will highlight the key security integration challenges faced by application teams developing enterprise solutions using loosely coupled, XML-based interfaces and service-oriented architectures. We will discuss how emerging standards and technologies address the practical security problems faced by development teams, the gaps that still remain, and the tradeoffs and compromises that architects and developers need to make to implement secure solutions today.

BIO: Phil Steitz is vice president, e-commerce applications development, at American Express. He has over 20 years of experience as a developer, architect, and technology leader involved in distributed systems development. Before joining American Express, Phil served as a middleware architecture consultant, designing large-scale distributed systems for enterprise customers. He holds a PhD in mathematics from the University of Maryland.

(XM6) Case Study: XML in the Life Sciences

TIM MATTHEWS, IPEDO

Wednesday March 19, 2003 11:00 A.M. - 11:50 A.M.

The importance of XML-based information in the health care and biotech industries has grown tremendously over the last two years, from R&D to clinical trials to manufacturing. Life sciences companies today are required to transfer and share huge quantities of information among the myriad of researchers and partners involved in the product development life cycle. The future of the life sciences market will be influenced by how well companies acquire, share, and apply knowledge to exploit the wealth of new opportunities while minimizing the deluge of new risks and costs. This session will provide a case study of how one life sciences company is implementing XML for a competitive advantage. It will also discuss how XML Management technology was used to provide scientists and analytic applications with the ability to efficiently search and analyze the data using sophisticated queries.

BIO: Tim Matthews has extensive experience in high-tech engineering, marketing, and sales. Prior to cofounding Ipedo in 2000, he was director of product marketing at RSA Security, where he oversaw a line of developer security products and a line of security infrastructure servers. Previously, Tim worked in international sales and business development at Digital Equipment Corporation in Tokyo and Irvine, California.

(XM7) Using XML for EAI: Best Practices

DAN ENACHE, TIBCO SOFTWARE

Wednesday March 19, 2003 3:00 P.M. - 3:50 P.M.

According to Gartner Group, EAI is the hottest IT market. Even in a slow economy, the EAI market is expected to grow at a steady pace, faster than most of the other sectors. How can you take advantage of EAI and help your company reap the benefits? What are the best practices in using XML to implement large EAI systems? What are the pros and cons in using XML as a "lingua franca"? How are people in the trenches using XML and EAI to build systems that work?

BIO: Dan Enache is a senior software architect for TIBCO Software. He is an expert in large integrations both in the EAI space and on the Web, as well as large portals and Single Sign-On integration solutions. Dan has extensive experience with high volume/high availability transactional/financial systems, and a great deal of expertise in implementing large security systems. He is a J2EE developer and Sun Java Architect

(XM8) Take XML with You: XML and Mobile Computing

HITESH SETH

Wednesday March 19, 2003 4:00 P.M. - 4:50 P.M.

Since its inception, XML has been used as the basis for an array of standards to catalyze mobile application development. This session will review some of the key standards in the wireless/speech applications area, and the design strategies involved in extending Web services and applications to the world of wireless, interactive speech recognition, and mobile computing.

BIO: Hitesh Seth is the chief technology officer of ikigo, Inc., a provider of XML-based Web services monitoring and management software. A freelance author and well-known speaker, he regularly writes for technology publications on VoiceXML, Web services, J2EE and Microsoft .NET, wireless computing, and enterprise/B2B integration. He is also the editor-in-chief of *XML-Journal*.

(XM9) XML, Ontologies & the Semantic Web

AYESHA MALIK, OBJECT MACHINES

Thursday March 20, 2003 9:00 A.M. - 9:50 A.M.

The Semantic Web has generated much talk ever since Tim Berners-Lee, the inventor of the World Wide Web, first mentioned it a few years ago. Get the architecture details behind a Semantic Web. In particular, the session links the study of ontologies for modeling knowledge representation with the requirements of a Semantic Web. Track W3C's standardization activity in building XML standards for the Semantic Web including and RDF and OWL (Web Ontology Language).

BIO: Ayesha Malik is a senior consultant for Object Machines, a software engineering firm providing Java technology and XML solutions to businesses. Ayesha has worked extensively on large XML and messaging systems for companies such as Deutsche Bank and American International Group (AIG). Most recently, she has been researching new ways to make schemas extensible and object oriented.

(XM10) XML Query

MIKE CHAMPION, RESEARCH AND DEVELOPMENT SPECIALIST, SOFTWARE AG

Thursday March 20, 2003 11:00 A.M. - 11:50 A.M.

As the ubiquitous data description and encapsulation standard, XML has quickly evolved into a container for all kinds of data. It is imperative that a standardized and flexible query and processing language be available to utilize the immense wealth of data that XML stores represent. Currently, even though established standards such as XSLT/XPath are available for transforming XML documents, the development around XQuery language has demonstrated the need for a flexible language for extracting data from XML documents. This session provides an introduction to XQuery language and illustrates its application through real-world scenarios.

BIO: Michael Champion is a research and development specialist at Software AG, working out of Ann Arbor, Michigan. He has been a software developer in the USA for 20 years, working primarily in the area of middleware for client/server document and image management systems. He has been active in the W3C's Document Object Model (DOM) Working Group for more than three years and was an editor of the core XML portion of the DOM Level 1 Recommendation. He is now cochair of the Web Services Architecture Working Group.

(XM11) XPath & XSLT 2.0

KURT CAGLE, CAGLE COMMUNICATIONS

Thursday March 20, 2003 3:00 P.M. - 3:50 P.M.

XPath and XSLT 1.0 are about to get a face-lift. Most of the improvements to the languages center on support for XML Schema, XML's official type system, although there are other compelling improvements that make the languages more usable as well. We'll walk you through "what's new" in both XPath and XSLT 2.0 and provide several examples using a reference implementation.

BIO: Kurt Cagle is the president of Cagle Communications, a consulting firm specializing in XML-related technologies, and is the author of 14 books on XML, XSLT, XQuery, and SVG. He is a columnist for *XML Magazine*, and publishes an e-newsletter that can be subscribed to from The Metaphorical Web.

(XM12) Third-Generation XML Tools

MICHAEL LEVENTHAL

Thursday March 20, 2003 4:00 P.M. - 4:50 P.M.

XML has become the ubiquitous infrastructure for Web services and a host of other software applications. The tools for building XML applications have progressed from the first generation of "hackerware" to a mature second generation of public and private domain tools providing SAX and DOM programming interfaces, robust parsing, well-formed and validation checking, and transformation with XSLT. Is there anything more to come? This presentation looks at two areas where interesting, third-generation tools are beginning to emerge: XML programming objects and streaming. With XML programming objects developers deal directly with document-specific classes derived from XML Schemas rather than generic document structures, as in the DOM or document events in SAX. JAXB reference implementation and Castor are two tools in this area, but there are also interesting developments coming that tightly mesh XML objects into programming languages. Streaming is based on the event model of XML parsing but goes beyond SAX with sophisticated techniques for analysis and processing of XML documents with ultra-low memory usage and high throughput. Streaming is being used in SOAP processors, search engines, entity resolvers, and transformation tools. Examples include the STX and XST transformation engines, Apache AXIS, and sequential XPATH implementations. At the end of this session we'll discuss ideas for next-generation XML tools

BIO: Michael Leventhal led the team that architected and developed a document-style SOAP framework for Commerce One. He has led numerous projects in the area of Web applications and infrastructure and XML (and SGML) over the last 10 years and wrote the first book on XML software development for the Internet in 1998.

(VN2) The XMLSPY 5 Enterprise Edition Development Environment

TRACE GALLOWAY, CORPORATE SALES MANAGER, ALTOVA

Tuesday March 18, 2003 11:00 A.M. - 11:50 A.M.

XML-related technologies have begun to reach critical mass in many areas of business today. From e-commerce solutions to data integration initiatives to content authoring and publishing, XML related technologies are being used to meet many of the present and future business challenges. Altova™'s XMLSPY 5 Enterprise Edition Development Environment is ideally suited to meet the needs of developers, Web designers, and line of business users that are required to develop and work with XML related technologies. XMLSPY 5 Enterprise Edition is the industry-standard XML Development Environment for designing, editing, and debugging enterprise-class applications involving XML, XML Schema, XSL/XSLT, SOAP, WSDL and Web Services technologies. It is the ultimate productivity enhancer for J2EE, .NET and database developers. In this presentation, attendees will be introduced to many of the features available in the Development Environment.

BIO: Trace Galloway is the corporate sales manager at Altova, Inc, creators of XMLSPY, the award-winning and industry-leading tool suite for XML. Prior to joining Altova, Trace served as the chief evangelist for Infoteria Corporation, a global technology company specializing in the development of B2B-centric, XML-based servers and components. He has presented at numerous industry conferences including Web Services Edge New York, XML Conference Baltimore, and ASP.NET & XML Web Services Solutions Conference. He was co-author of a chapter entitled "Lead Tracking by Web and Email" in the *XML Handbook*" Third Edition.

(VN3) SOAP and Java: Marrying Them Off

ALEXANDER MARLER, PARASOFT

Tuesday March 18, 2003 3:00 P.M. - 3:50 P.M.

SOAP is a lightweight, XML-based protocol for exchanging structured and typed information between peers in a decentralized, distributed environment. Although SOAP strives to be agnostic with respect to programming languages, some languages facilitate working with SOAP better than others. The combination of Java's strong typing system and its reflection API make Java especially conducive to implementing SOAP-based Web services. The presentation will explore how Java facilitates the automation of activities such as WSDL (Web Services Description Language) generation and SOAP deployment. It will also discuss how these features are influencing the development of Java-based SOAP tools.

BIO: Alexander Marler, software technical consultant, joined Parasoft to provide technical pre and post sales support along with business development for specific product lines. He has over 15 years of sales and technical expertise in the high tech industry. He has been responsible for product and business development at Sybase Inc., Charles Schwab, and Hunt-Wesson Foods. Marler received his Bachelor of Science in Management Information Systems from Washington State University.

(VN5) Process-Centric Enterprises: The Coming Revolution in Web Services–Driven Business Analytics

ERIC PULIER, CHAIRMAN AND CEO, DIGITAL EVOLUTION

Wednesday March 19, 2003 9:00 A.M. - 9:50 A.M.

As major companies transition to Web services and the Service Oriented Architecture (SOA), they are beginning to tap into the SOA's ability to provide greater visibility into business operations in real time. This presentation will explore how exposing the IT functions of a given business process as Web services makes it possible to monitor the activities of that process, even if the process occurs across multiple lines of business and IT systems. The result is what Mr. Pulier terms the "Process-centric" enterprise, which benefits from the functionality of integrated applications and systems without the rigid, time-consuming, and costly process of actual application integration. This session will address these issues and others as he lays out his vision of where enterprise computing is heading.

BIO: Recently named one of 30 e-Visionaries by VAR Business, Eric Pulier is a popular speaker at many elite technology conferences. As CEO and founder of Digital Evolution, he drives the operations and strategic vision of a company that is making the service-oriented architecture revolution a reality. Pulier has been a pioneer in the interactive industry for over 15 years. In 1997, the Presidential Inaugural Committee selected Mr. Pulier to create and execute the Presidential Technology Exhibition in Washington, D.C. He is a graduate of Harvard University.

(VN6) Pattern-Driven Application Development

TOM SHORE, SENIOR PRODUCT CONSULTANT, COMPUWARE

Wednesday March 19, 2003 11:00 A.M. - 11:50 A.M.

OMG's model-driven architecure (MDA) allows organizations to build platform and language neutral models and specifications of functionality. This approach will improve the stability, durability, and reuse of models, as they are not bound to any specific technology. Furthermore, it will boost developer productivity by increasing the code generation capabilities of development tools. As models are translated from a platform independent model (PIM) to a platform specific model (PSM), and further to an implementation (code) model, intelligent code generation engines are able to produce more and better code. Compuware's OptimalJ J2EE development tool is the only implementation of the OMG MDA so far. This presentation discusses how OptimalJ implements OMG's MDA.

BIO: Thomas S. Shore is a senior product consultant with Compuware Corporation's Application Development & Portal Solutions Software Division. Thomas joined Compuware in 1993 and held various positions before focusing on J2EE and related technologies. He has also held various software engineering and consulting positions in the manufacturing, oil & gas exploration and database software markets.

(VN7) Managing the Developer Relationship

MIKE BELLISSIMO, SUN MICROSYSTEMS

Wednesday March 19, 2003 3:00 P.M. - 3:50 P.M.

More and more vendors are developing extensive programs to capture developer interest and loyalty. These programs must adopt a philosophy of managing and enhancing the individual developer's entire experience through the life cycle of the relationship. This includes managing the developer's experience in all places where it touches the vendor. Mike Bellissimo, senior director of Sun Microsystems Software Developer Marketing and Management, will discuss how he believes developers can and should be supported with programs that help them learn, plan, evaluate, and develop their products and services.

BIO: In over a decade at Sun, Mike Bellissimo has managed sales operations for iPlanet and JavaSoft, software training and services for SunSoft, and developer programs and strategy in Sun's market development organization. Previously he managed product training for field and reseller organizations.

(VN10) Model Driven Development of Web Services in UML for the J2ME Platform

BILL GRAHAM, RATIONAL SOFTWARE

Thursday March 20, 2003 11:00 A.M. - 11:50 A.M.

Mobile and wireless clients are an integral part of the vision for Web services. The hardware computing and memory limitations of handheld and wireless devices require the use of lean-and-mean utilities to make Web services practical. This presentation looks at some of the possible solutions in the context of a typical J2ME platform. Models of possible architectures for J2ME applications are explored through the use of UML. Using models to generate code and therefore applications through Model Driven Development (MDD) are also introduced.

BIO: Bill Graham is the embedded Java evangelist at Rational Software. He has over 14 years of experience in working with real-time and embedded systems. He has presented at JavaOne, the Rational Users Conference, and the IEEE International Performance, Computing, and Communications Conference (IPCCC). Bill has a B. Eng. and a M. Eng. from Carleton University, Ottawa.

(VN11) Why Web Services Management?

JON ATKINS, HP

Thursday March 20, 2003 3:00 P.M. - 3:50 P.M.

The popularity of Web services continues to grow because they reduce integration costs and enable greater flexibility and ease in exposing applications as new sources of revenue. However, this benefit is achieved with less secure, less reliable communications. To get the most out of Web services, you must be able to manage and control the new risks that come with them. This lively and informative presentation will answer these questions and reveal the importance of developing Web services with manageability in mind.

BIO: Jon Atkins is the product manager for HP's Web Service Management Platform. He brings 10 years of marketing, sales and advertising experience, primarily in high technology.

Java University℠ Program: Aggressive, code-level training courses for experienced developers using Java™ technology, brought to you by Sun Microsystems, Inc. Attend seminars designed by industry luminaries and recognized experts. Sessions cover Sun certification and Web services technology. Whether you're a beginner or a veteran developer, architect, or software engineer, you'll benefit from these value-packed full-day courses. Register now. Seating is limited.

The Java University℠ program complements this year's Web Services Edge conference by offering 3 full-day training lectures for experienced software developers, architects, and engineers.

Java University℠ Program Take-Aways:

- Training designed and presented by expert Java technology engineers
- Student guides full of source code, examples, references and copies of instructors' materials
- Free Web-based training courses from Sun Educational Services

Tuesday, March 18, 2003

Web Services Using Java™ Technology and XML

SANG SHIN, SUN MICROSYSTEMS, INC.

Who Should Attend

Web services designers and programmers, application developers, and programmers using the Java programming language who have experience using the Java™ 2 Platform, Enterprise Edition (J2EE™).

Prerequisites

Experience using the Java programming language and basic knowledge of XML

Overview

This one-day seminar provides in-depth knowledge on Web services and shows how to develop Web services using the Java programming language and XML, the technologies of portable code and portable data respectively.

The session will start with an introduction on fundamental concepts and characteristics of Web services. This will be followed by a detailed explanation of how to implement, describe, register, discover, and invoke Web services using core Web services standards - Simple Object Access Protocol (SOAP); Web Services Description Language (WSDL); and Universal Description, Discovery, and Integration (UDDI). In addition, the ebXML standard, which defines the framework for the global electronic marketplace will be talked about in detail. Also, the tools for building and deploying Web services will be discussed. Each topic will be presented with concrete examples and demonstrations when possible.

Attendees will also learn how to use standard Java APIs for Web services, mainly Java API for XML Messaging (JAXM), Java technology API for XML-based RPC (JAX-RPC), and Java technology API for XML Registries (JAXR) for developing and deploying Web services.

Benefits

- Learn the fundamental concepts and characteristics of Web services. Gain detailed understanding on core Web services standards: SOAP, WSDL, UDDI.
- Gain a detailed understanding of ebXML, the standard framework for electronic business.
- Learn Java programming language APIs for Web services – JAXM, JAX-RPC, JAXR

Wednesday, March 19, 2003

Java™ 2 Platform: Programmer Certification Fast Path

PHILIP HELLER, PRESIDENT, HELLER ASSOCIATES

Who Should Attend

This session is designed for programmers who have some exposure to the Java™ programming language, and are ready to prepare for the Sun Certified Programmer for Java 2 Platform exam.

Prerequisites

Object-oriented software development experience and familiarity with the syntax and structure of Java technology-based development.

Overview

The development community recognizes that competency developing solutions using Java technology is vital to productivity, reaffirms your value to your organization, and increases your career advancement opportunities. This session, developed and delivered by Philip Heller, author of the two leading Java technology certification preparation manuals, helps to prepare you for the Sun Certified Programmer for the Java 2 Platform exam. Philip provides code-level, detailed review of the skills and knowledge needed to confidently approach the exam.

Benefits

- Receive an intensive review of the advanced topics covered on the Sun Certified Programmer for the Java 2 Platform Exam
- Increase your understanding and knowledge of Java programming language syntax and structure
- Prepare for the exam by reviewing practice tests and questions
- Gain a strong understanding of Java fundamentals

Thursday, March 20, 2003

Java™ 2 Platform: Architect Certification Fast Path

SIMON ROBERTS, TECHNOLOGY EXPERT AND COURSE DEVELOPER, SUN MICROSYSTEMS, INC.

Who Should Attend

This session is designed for enterprise application architects, system analysts, experienced technologists, and developers using Java™ technology seeking certification as an architect for the Java™ 2 Platform, Enterprise Edition (J2EE™).

Prerequisites

Understand the benefits of Java technology solutions; experience with object-oriented analysis and design; familiarity with concepts of distributed computing.

Overview

Many of the solutions in today's "Net economy" are, or soon will be, developed using the Java 2 Platform, Enterprise Edition (J2EE) architecture. Gaining recognized competency architecting J2EE platform-based solutions is vital to your success as an architect, reaffirms your value, and increases your career opportunities.

Developed and presented by Mark Cade, this intense one-day session helps prepare attendees to pass the Sun Certified Enterprise Architect for J2EE Technology exam. This session provides an overview of the components comprising the J2EE architecture as a whole, emphasizes the incorporation of J2EE technology into an architecture, and reviews each of the certification exam's testing objectives. Multiple real-world case studies are used to demonstrate correctly architected J2EE technology–based solutions and pinpoint key topics presented within the architect exam.

Additionally, you will learn how to interpret exam objectives, what each of the three exam phases contains, and clear guidelines and resources to use after the course.

Benefits

- Receive an intensive review of the topics covered on the Sun Certified Enterprise Architect for the Java 2 Platform, Enterprise Edition Exam
- Increase your understanding and knowledge of successfully architecting solutions using J2EE technology
- Understand the system qualities: scalability, availability, extensibility, performance, and security
- Understand trade-offs of different architectural choices as they pertain to system qualities.
- Describe the benefits and weaknesses of potential J2EE technology–based architectures
- State benefits and costs of persistence management strategies
- Review real-world case studies of J2EE technology–based architecture
- Prepare for the exam by reviewing practice tests and questions

XML Certified Developer *Fast Path*

Tuesday, March 18, 2003
9:00 am - 5:00 pm

Audience
This tutorial is for programmers who have some knowledge of XML and related technologies and would like to pass the IBM Certified Developer Test 141 on XML and Related Technologies

Prerequisites
Background in object-oriented programming and knowledge of Hypertext Markup Language (HTML). Exposure to XML and related technologies.

Overview
XML is the foundation of two important emerging technologies: Web services and the Semantic Web. XML expertise and certification is critical for developers who want to remain competitive in the current tight IT job market. The practice tests and questions in this course are specially designed to teach you XML essentials and the key concepts to successfully pass IBM® Test 141 on XML and related technologies.

Outline
- Well formed XML documents
- XML Infoset
- XML namespaces
- Document analysis and modeling
- Document Type Definitions (DTDs)
- XML Schemas
- The SAX API
- The DOM API
- XPath and XSLT
- XSL Formatting Objects (XSL FOs)
- Formatting XML with CSS
- XLink and XPointer
- XML Encryption
- XML Signatures
- SOAP, UDDI, and WSDL
- XML architectures based on business and technical considerations
- Optimization and testing of XML applications

Presenter Bio
Joel Amoussou is the founder and chief learning architect of XMLMentor. Joel is the author of the first XML training course specially designed to prepare developers for IBM® Test 141 on XML and related technologies. He has created XML content management applications for the aerospace, pharmaceutical, and publishing industries.

Microsoft® FREE .NET Web Services Tutorial

Russ' Tool Shed

Wednesday, March 19, 2003
9:00 a.m. – 5:00 p.m.

Join Russ as he shows you how to use Visual Studio .NET

9-12:15 Intro to Web Services Using VS.NET by Russ Fustino
One of the key ideas behind the .NET strategy is the concept of software as a service, or in short, Web services. This session will explain what a Web service is and provide an overview of its related technologies like XML, SOAP and UDDI. We will demonstrate how the .NET Framework makes it easy to implement them for new and existing applications. This session will also provide concrete best practices for building XML Web services using Visual Studio .NET. We'll answer many common questions like: How will my Web service scale? How can my XML Web services enable interoperability with Web services from other vendors as well as within my own organization? We'll delve into building highly reliable and secure Web services. Also, we will discuss issues such as dealing with complex data types using WSDL (Web Services Description Language), as well as securing SOAP messages using encryption. We'll see how developers can use enterprise-level XML Web services to simplify customer solutions.

1-2:30 - Advanced Web Services Using ASP .NET by Thom Robbins
This session will explore some of the more advanced areas of SOAP in ASP.NET's support for Web services. ASP.NET Web services are the preferred way for Web developers to expose Web services on the Internet. The goal is quick, easy, and high-performing SOAP services. We will look at how to use the SOAP extension classes to create some very interesting applications on top of the core SOAP architecture found within the .NET Framework. For instance, you can implement an encryption algorithm or screen scraping on top of the Web service call. We'll dig into more advanced topics, explore the SOAP headers, and see ways to ensure security in our Web services.

2:45-4:15 - .NET Remoting Essentials
2:45-4:15 - .NET Remoting Essentials
Microsoft .NET Remoting is the .NET technology that allows you to easily and quickly build distributed applications. All of the application components can be on one computer or they can be on multiple computers around the world. .NET Remoting allows client applications to use objects in other processes on the same computer or on any other computer to which it can connect over its network. During this presentation we will discuss what you will need to know to get started with .NET Remoting. We will talk about how .NET Remoting compares with DCOM, how to host remoted objects in a variety of applications, how to call remoted objects from a client application,

To learn more, visit www.sys-con.com

Mobile .NET

Thursday, March 20, 2003
9:00 am - 5:00 pm

Overview
In this session, Derek Ferguson, editor-in-chief of *.NET Developer's Journal*, will give you a thorough introduction to the use of .NET with all manner of mobile computing devices.

The morning will begin with a comprehensive survey of the five most popular mobile computing platforms: Pocket PC, Palm OS, WAP, i-Mode, and J2ME. It will conclude with a thorough examination of how the Mobile Internet Toolkit (a.k.a. "the MIT"), a key part of Microsoft's mobile .NET strategy, can be leveraged to build Web-based applications capable of working with any of these devices.

In the afternoon, we will discuss Microsoft's technology for building self-contained .NET applications for execution on "smart devices" the .NET Compact Framework. Before the end of the session, such advanced topics as COM Interoperability, SQL Server CE, and MIT extensibility will be covered.

Presenter Bio
Derek Ferguson is chief technology evangelist for Expand Beyond Corporation (www.xb.com), the world-wide leader in mobile software for enterprise management. He is also editor-in-chief of *.NET Developer's Journal* and author of the book *Mobile .NET*.

Derek Ferguson
Editor-in-Chief, *.NET Developer's Journal*
Chief Technology Evangelist, Expand Beyond Corp.

Register by Phone 201 802-3058

Major Sponsors at the World's Largest Web Services, Java, XML, and .NET Conference and Expo

2003 East Gold Sponsors

COMPUWARE

Compuware will be the best worldwide provider of quality software products and services designed to increase productivity. We will continue to create practical solutions that meet our customers needs and surpass their expectations. We will provide an environment for our employees where excellence is encouraged and rewarded and where diversity is promoted at all levels of the company.
Compuware is built upon a diverse employee population with a set of key attributes that is common to every individual: Secure, Moral, Ethical, In Agreement with Economic Purpose, Team Player, Other Oriented, Positive, Optimistic, Energetic Achiever and Bright.

Microsoft

Introducing Visual Studio .NET; visionary yet practical, the single comprehensive development tool for creating the next generation of applications has arrived. Developers can use Visual Studio .NET to:
• Build the next-generation Internet.
• Create powerful applications fast and effectively.
• Span any platform or device.
Visual Studio .NET is the only development environment built from the ground up for XML Web services. By allowing applications to share data over the Internet, XML Web services enable developers to assemble applications from new and existing code, regardless of platform, programming language, or object model.

ORACLE

Oracle Corporation (Nasdaq: ORCL) is the world's largest enterprise software company, providing enterprise software to the world's largest and most successful businesses. With annual revenues of more than $9.4 billion, the company offers its database, tools, and application products, along with related consulting, education, and support services. Headquartered in Redwood Shores, California, Oracle is the first software company to develop and deploy 100 percent Internet-enabled enterprise software across its entire product line: database, server, enterprise business applications, and application development, and decision support tools.

2003 East Silver Sponsor

hp invent

HP is a leading provider of products, technologies, solutions and services to consumers and business. The company's offerings span IT infrastructure, personal computing and access devices, global services, and imaging and printing. Our $4 billion (U.S.) annual R&D investment fuels the invention of products, solutions and new technologies, so that we can better serve customers and enter new markets. We invent, engineer, and deliver technology solutions that drive business value, create social value, and improve the lives of our customers.

2003 East Featured Sponsor

Sun microsystems

Sun was founded with one driving vision. A vision of computers that talk to each other no matter who built them. A vision in which technology works for you, not the other way around. While others protected proprietary, stand-alone architectures, we focused on taking companies into the network age, providing systems and software with the scalability and reliability needed to drive the electronic marketplace.

2003 East Corporate Sponsors

IONA

IONA is the leading e-Business Platform provider for Web Services Integration. IONA Orbix E2A enables the flow of information across disparate systems and the liberation of application assets for new business opportunities. For additional information about IONA, visit our Web site at http://www.iona.com.

Rational the e-development company™

Rational Software provides a software development platform that improves the speed, quality, and predictability of software projects. This integrated, full life-cycle solution combines software engineering best practices, market-leading tools, and professional services. Ninety-six of the Fortune 100 rely on Rational tools and services to build better software, faster. Additional information is available on the Internet at http://www.rational.com

SAMS

Sams Publishing has more than 500 titles in print, and is one of the most successful computer book publishers in the world. From introductory tutorials to comprehensive reference books, Sams Publishing focuses on teaching tomorrow's programmers, developers and system administrators the skills they need to build and manage emerging technologies.

SYBASE

Sybase has always delivered solutions that help customers to share data, is platform independent, and integrates everything: platforms, application servers, components, databases, portals, processes, message brokers, and mobile/wireless. Our technologies have the insight that will promote ease of use, leverage best practices, ensure positive ROI, and help your organization build a successful, pragmatic strategy based on next-generation technologies. Check us out at http://www.sybase.com/solutions/e-business

DIGITAL EVOLUTION
The Business Value of Web Services

DE solutions and thought leadership deliver the value of Web services to business users today. DE unleashes the value of underlying IT assets, giving enterprises the freedom to innovate and evolve business processes within a standards-based, vendor neutral, loosely coupled framework. Some of the largest corporations in the world rely on DE's Web services solutions. www.digev.com

The Largest Expo Focusing on Java, Web Services, .NET & XML

Walk the Expo Floor, visit each of these pioneers, and get the answers you need!

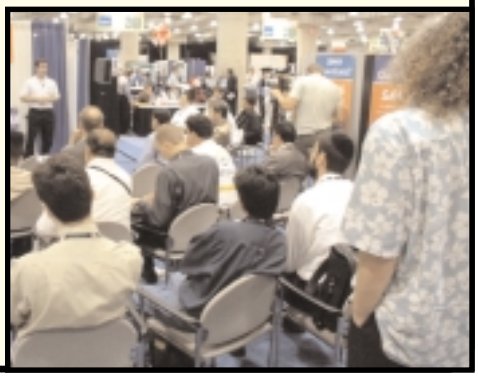
Please refer to the conference Web site for an updated list of sponsors & exhibitors

Expo Hours
Exhibit Hall A
Wednesday, March 19:
11:00am - 6:00pm
Thursday, March 20:
11:00am - 4:00pm

Opening Night Reception on the Expo Floor
Wednesday, March 19:
5:00pm - 6:00pm

- Actional
- Altio
- Altova
- asp.netPRO
- ASPstreet.com
- Attachmate
- BEA WebLogic Developer's Journal
- Borland
- ColdFusion Developer's Journal
- Compuware
- Digital Evolution
- EAI Industry Consortium
- Ektron
- Fair, Isaac and Company
- Forum Systems
- GAO Web Services Inc.
- Hewlett-Packard
- HSPstreet.com
- Infragistics
- IONA
- Java Developer's Journal
- JavaWorld
- McCabe & Associates
- Melissa Data
- Merant
- Microsoft
- Mindreef
- .NET Developer's Journal
- Novell
- OASIS
- ParaSoft
- PerfectXML
- Rational Software
- SAMS Publishing
- SD Times
- SoftArtisans
- Software AG
- Sonic Software
- SpiritSoft
- Sun Microsystems
- Sybase
- TeamStudio
- TogetherSoft
- Web Services Journal
- WebSphere® Developer's Journal
- Wireless Business & Technology
- XML-Journal
- Xtremesoft

(List as of December 2002)



HOTEL ARRANGEMENTS ARE EASIER THAN EVER!

Special arrangements have been made with some of Boston's finest hotels, priced well below regular rates. Hotels are located within walking distance, if not connected to the Hynes Convention Center. To learn more about hotel savings, call ETI at (800) 829-2281 or (201) 444-0060 (direct) or fax reservations to (201) 444-0062. To make online reservations visit www.expotravel.com by February 24, 2003.

SPECIAL RATES

Official Hotel	Address	Single	Double
Hilton Boston Back Bay	40 Dalton Street	$149	$149
Sheraton Boston Hotel	39 Dalton Street	$159	$159

To make reservations call (800) 829-2281or (201) 444-0060 (direct). Fax reservations to (201) 444-0062. Credit card information is required to guarantee reservations and expedite confirmation. Confirmations will be mailed directly from the hotel, time permitting. All changes and cancellations should be made directly through ETI.

Special Arrangements have been made with these Airlines for Web Services Edge East 2003 Attendees!

American Airlines is proud to offer discounted fares to Web Services Edge East 2003 attendees to fly to Boston this March 18-20, 2003.
Valid travel dates are March 13 to March 25, 2003.
American is offering 5% off the lowest published fare or 10% off full Coach, Business and First class fares. In addition, American is extending a 5% bonus discount for ticketing 30 days in advance. For reservations, call American at (800) 433-1790 and reference STAR file number A5433AW

Continental Airlines is proud to offer Web Services Edge East 2003 attendees Special Fares! Fly to Boston & Web Services Edge East 2003 this March 18-20, 2003.
Special rates are valid for travel from March 13 to March 25, 2003.

For Reservations & Ticketing:
Contact Continental MeetingWorks (6:00am - 10:00pm CST , Seven (7) day a week) at (800) 468-7022 (United States or Canada) and provide the Z Code ZWMF and Agreement Code VSD04D. For International reservations contact the local Continental Airlines Reservations Office.

AVIS is Proud to Offer Special Rates for:
Web Services Edge East 2003
March 18 - 20, 2003
Boston, MA
Avis Worldwide Discount (AWD) Number: D918596
Call (800) 331-1600

REGISTRATION FORM

CONFERENCE: March 18 – 20, 2003 EXPO: March 19 – 20, 2003

John B. Hynes Veteran Memorial Convention Center • Boston, MA

THREE WAYS TO REGISTER FOR CONFERENCE

1) On the Web: Credit Cards or "Bill Me" Please make checks payable to SYS-CON Events
2) By Fax: Credit Cards or "Bill Me" 201-782-9651
3) By Mail: 135 Chestnut Ridge Road, Montvale, New Jersey 07645, Attention: Registration

Please note: Registrations are not confirmed until payment is received.

Please complete sections 1, 2, 3 and 4

1 YOUR INFORMATION (Please Print) ☐ Mr. ☐ Ms.

First Name _____ Last Name _____

Title _____

Company _____

Street _____

Mail Stop _____

City _____

State _____ Zip _____ Country _____

Phone _____

Fax _____ E-Mail _____

2 PAYMENT METHOD: (Payment in full due with registration)

☐ Check or Money Order Enclosed (Registration confirmed upon receipt of payment)

Check #_____ Amount of Check $ _____

Charge my ☐ Visa ☐ MasterCard ☐ American Express ☐ Discover

Name on card_____

Card #_____ Exp. Date_____

Signature_____

Billing Address (if different from mailing address)

_____

3 PLEASE INDICATE YOUR CONFERENCE CHOICE

Total Registration fee $_____

	Before 2/14/03	Before 3/14/03	On Site
❑ **GP Gold Passport** Good for all three days of the .NET, Web Services, XML, Java, and Vendor Tracks, including the XML Certified Developer Fast Path Tutorial, Keynotes, Panel Discussions, preferred seating for Microsoft .NET's Russ' "Tool Shed" Tutorial, and your choice of One Sun Microsystems Java™ University Class	$1,495.00	$1,695.00	$1,795.00
❑ **3D Three Day Conference** (Does not include Sun Java™ Education)	$1,295.00	$1,495.00	$1,695.00
❑ **2 Day Conference** (Does not include Sun Java™ Education) (select any two days: ❑ Tue. ❑ Wed. ❑ Thurs.)	$1,195.00	$1,295.00	$1,395.00
❑ **1 Day Conference** (Does not include Sun Java™ Education) (select any one day: ❑ Tue. ❑ Wed. ❑ Thurs.)	$495.00	$695.00	$895.00
❑ **JU1 Sun Java™ University Class** Select one: ❑ Web Services Programming Using Java™ Technology and XML (Mar.18) ❑ Java™ Fast Path: Programmer (Mar.19) ❑ Java™ Fast Path: Architect (Mar. 20)	$695.00	$895.00	$995.00
❑ **JU2 Sun Java™ University Class** Select two: ❑ Web Services Programming Using Java™ Technology and XML (Mar.18) ❑ Java™ Fast Path: Programmer (Mar.19) ❑ Java™ Fast Path: Architect (Mar. 20)	$1,295.00	$1,495.00	$1,595.00
❑ **JU3 Sun Java™ University Class** Select three: ❑ Web Services Programming Using Java™ Technology and XML (Mar.18) ❑ Java™ Fast Path: Programmer (Mar.19) ❑ Java™ Fast Path: Architect (Mar. 20)	$1,495.00	$1,695.00	$1,895.00

4

A. Your Job Title

❑ CTO, CIO, VP, Chief Architect
❑ Software Development Director/Manager/Evangelist
❑ IT Director/Manager
❑ Project Manager/Project Leader/Group Leader
❑ Software Architect/Systems Analyst
❑ Application Programmer/Evangelist
❑ Database Administrator/Programmer
❑ Software Developer/Systems Integrator/Consultant
❑ Web Programmers
❑ CEO/COO/President/Chairman/Owner/Partner
❑ VP/Director/Manager Marketing, Sales
❑ VP/Director/Manager of Product Development
❑ General Division Manager/Department Manager
❑ Other (please specify)_____

B. Business/Industry

❑ Computer Software
❑ Computer Hardware and Electronics
❑ Computer Networking & Telecommunications
❑ Internet/Web/E-commerce
❑ Consulting & Systems Integrator
❑ Financial Services
❑ Manufacturing
❑ Wholesale/Retail/Distribution
❑ Transportation
❑ Travel/Hospitality
❑ Government/Military/Aerospace
❑ Health Care/Medical
❑ Insurance/Legal
❑ Education
❑ Utilities
❑ Architecture/Construction/Real Estate
❑ Agriculture
❑ Nonprofit/Religious
❑ Other (please specify)
_____

C. Total Number of Employees at Your Location and Entire Organization (check all that apply):

	Location	Company
10,000 or more	01 ❑	01 ❑
5,000 - 9,999	02 ❑	02 ❑
1,000 - 4,999	03 ❑	03 ❑
500 - 999	04 ❑	04 ❑
100-499	05 ❑	05 ❑
100 or less	06 ❑	06 ❑

D. Please indicate the value of communications and computer products and services that you recommend, buy, specify or approve over the course of one year:

❑ $10 million or more
❑ $1 million - $9.9 million
❑ $500,000 - $999,999
❑ $100,000 - $499,999
❑ $10,000 - $99,999
❑ Less than $10,000
❑ Don't know

E. What is your company's gross annual revenue?

❑ $10 billion or more
❑ $1 billion - $9.9 billion
❑ $100 million - $999 million
❑ $10 million - $99.9 million
❑ $1 million - $9.9 million
❑ Less than $1 million
❑ Don't know

F. Do you recommend, specify, evaluate, approve or purchase wireless products or services for your organization?
01 ❑ Yes 02 ❑ No

G. Which of the following products, services, and/or technologies do you currently approve, specify or recommend the purchase of?

❑ Application Servers
❑ Web Servers
❑ Server Side Hardware
❑ Client Side Hardware
❑ Wireless Device Hardware
❑ Databases
❑ Java IDEs
❑ Class Libraries
❑ Software Testing Tools
❑ Web Testing Tools
❑ Modeling Tools
❑ Team Development Tools
❑ Installation Tools
❑ Frameworks
❑ Database Access Tools / JDBC Devices
❑ Application Integration Tools
❑ Enterprise Development Tool Suites
❑ Messaging Tools
❑ Reporting Tools
❑ Debugging Tools
❑ Virtual Machines
❑ Wireless Development Tools
❑ XML Tools
❑ Web Services Development Toolkits
❑ Professional Training Services
❑ Other [Please Specify]

If you require special assistance covered under the Americans with Disabilities Act, please call 201-802-3058 by March 4, 2003.

CANCELLATIONS, SUBSTITUTIONS, REFUNDS

Fax written request to SYS-CON Registration 201-782-9651. Requests for refunds received prior to February 15, 2003 will be honored, less a 10% handling charge; requests received after February 15, 2003, and before March 1, 2003, will be honored less a 20% handling charge. No requests for refunds will be honored after March 1, 2003. Requests for substitutions must be made in writing prior to March 14, 2003. No one under 18 is permitted to attend. No warranties are made regarding the content of sessions or materials. Speakers, sessions and schedule are subject to change without prior notice.

No solicitation by anyone other than official exhibitors, sponsors or marketing partners is permitted. Such behavior is cause for expulsion without refund.

REGISTER ONLINE TODAY @ SYS-CON.COM

JDJ EDGE conference&expo | web services EDGE conference&expo | .NET EDGE conference&expo | XML EDGE conference&expo

Don't Miss the Developer Event of 2003

Meet with the industry experts, professionals, and visionaries connecting the enterprise with today's i-technology!

Conference
March 18–20, 2003

Exposition
March 19–20, 2003

Hynes Convention Center, Boston

WEB SERVICES EDGE CONFERENCE PAST SPONSORS & EXHIBITORS

SYS-CON EVENTS
135 Chestnut Ridge Rd.
Montvale, NJ 07645

JAVA DEVELOPER'S JOURNAL ADVERTISER INDEX

ADVERTISER	URL	PHONE	PAGE
AccelTree	www.acceltree.com	+91-20-528 58 81	38
Altova	http://jdj.altova.com/code	978-816-1600	13
Crystal Decisions, Inc	www.crystaldecisions.com/cr9/218	888-333-6007	2
Extentech Inc.	www.extentech.com	415-759-5292	60
Fiorano Software, Inc.	www.fiorano.com	408-354-0846	45
InetSoft Technology Corp.	www.inetsoft.com/jdj	888-216-2353	35
Infragistics, Inc.	www.infragistics.com	800-231-8588	14-15
InstallShield	www.installshield.com/mpjdj	847-466-6000	29
INT, inc.	www.int.com	713-975-7434	34
Intraware	www.intraware.com/evalapp/	800-469-4313	36
iSavvix	http://community.isavvix.com	703-689-3190	49
ITKO	www.itko.com/lisa		11
JDJ Workshop	www.sys-con.com/education	201-802-3058	59
Jinfonet	www.jinfonet.com/j3.htm	301-838-5560	33
Kenetiks	www.kenetiks.com	888-KENETIKS	23
Linux Business & Technology	www.sys-con.com	888-303-5282	57
Macromedia	www.macromedia.com/go/jrun4jdj	415-252-2000	41
/n software inc.	www.nsoftware.com/subscriptions	800-225-4190	39
ObjectVenture	www.objectventure.com/tutorials	978-425-9654	47
Oracle	oracle.com/experts	800-633-1072	7
Parasoft Corporation	www.parasoft.com/jdj2	888-305-0041	4
Precise Software	www.precise.com/jdj	800-310-4777	31
QUALCOMM Incorporated	www.brew2003.com	858-587-1121	55
Rational Software	www.rational.com/offer/javacd2	408-863-9900	19
ReportingEngines	www.reportingengines.com/download/jdj1/jsp	888-884-8665	26-27
ReportingEngines	www.reportingengines.com/download/jdj2.jsp	888-884-8665	17
ReportMill Software	www.reportmill.com/webstart	214-513-1636	37
Salmon LLC	www.salmonllc.com/sofia-jdj	516-485-1118	25
Sitraka (now part of Quest Software)	www.sitraka.com/jclass/jdj	800-663-4723	84
Sitraka (now part of Quest Software)	www.sitraka.com/jprobe/jdj	800-663-4723	51
Sitraka (now part of Quest Software)	www.sitraka.com/performasure/jdj	800-663-4723	21
SpiritSoft	www.spiritsoft.com		83
WebAppCabaret	www.webappcabaret.com/jdj.jsp	831-464-6941	43
Web Services Edge 2003	www.sys-con.com/webservicesedge2003east/registernew.cfm	201-802-3069	61-72
Zero G	www.zerog.com	415-512-7771	3

General Conditions: The Publisher reserves the right to refuse any advertising not meeting the standards that are set to protect the high editorial quality of ***Java Developer's Journal***. All advertising is subject to approval by the Publisher. The Publisher assumes no liability for any costs or damages incurred if for any reason the Publisher fails to publish an advertisement. In no event shall the Publisher be liable for any costs or damages in excess of the cost of the advertisement as a result of a mistake in the advertisement or for any other reason. The Advertiser is fully responsible for all financial liability and terms of the contract executed by the agents or agencies who are acting on behalf of the Advertiser. Conditions set in this document (except the rates) are subject to change by the Publisher without notice. No conditions other than those set forth in this "General Conditions Document" shall be binding upon the Publisher. Advertisers (and their agencies) are fully responsible for the content of their advertisements printed in ***Java Developer's Journal***. Advertisements are to be printed at the discretion of the Publisher. This discretion includes the positioning of the advertisement, except for "preferred positions" described in the rate table. Cancellations and changes to advertisements must be made in writing before the closing date. "Publisher" in this "General Conditions Document" refers to SYS-CON Publications, Inc.

What's in the next issue of *JDJ*?

IS J2EE TOO BIG FOR ITS OWN GOOD?

Speaking with Sun's J2EE marketing team recently, we learned that J2EE 1.4 has been delayed so that "vital" new Web services features could be added. Originally targeted for the second half of 2002, J2EE 1.4 FCS is not expected now until this summer. Is Sun's current monolithic approach to the Enterprise Edition appropriate or effective? On the one hand, J2EE 1.4 is just another set of specifications going through the Java Community Process (JCP); like all standards processes that's bound to mean compromises and delays as competitors sit around the table to hammer out the details. But J2EE is a big beast, as we've all learned from bitter experience.

DEBUNKING THE MYTH OF IN-PROCESS APPLICATION LAYER CACHING IN J2EE ARCHITECTURES

J2EE applications are characterized by the continuous creation, consumption, and destruction of various types of application objects. Creation and destruction of these objects is expensive – object creation usually requires accessing persistent storage in back-end systems, while object destruction requires releasing resources used by the object.

DELIVER APPLICATION MANAGEMENT WITH JMX

As enterprises increasingly deploy Java and J2EE applications to drive mission-critical business processes, application management is getting more attention. The priority of the application and the scale of the business are important drivers for application management. Without scale and diversity, it's easy to make do without these capabilities. But with any sizable deployment, the costs of not having application management are quickly apparent.

SWT – A NATIVE WIDGET TOOLKIT FOR JAVA

The Standard Widget Toolkit (SWT) is a Java class library that allows you to create native user interfaces. It's designed to provide efficient, portable access to the underlying facilities of the operating system on which it's implemented. SWT uses native widgets wherever possible, giving an SWT program a native look and feel and a high level of integration with the desktop. This article introduces SWT by describing some of the basic concepts and classes.

PRODUCT REVIEW: FIRSTSQL/J PROFESSIONAL V2.0 BY FIRSTSQL

A well-designed database offers flexibility, speed, and easy data manipulation through JDBC support. This database must be 100% Java to maintain the cross-platform compatibility as well as easy to use so the average Java programmer can integrate it with little difficulty. FirstSQL provides such a database in FirstSQL/J Professional.

Confessions of a Procedural Programmer

WRITTEN BY
BLAIR WYMAN

Okay, I'll risk my career and admit it: I not only know how to draw a flowchart, I still find myself using them from time to time.

I have one of those little green plastic flowcharting templates to help draw the symbols and arrowheads, but I don't use it much anymore. (I don't like to take it out of its climate-controlled vault; the chill might warp my precious slipstick.)

I'll bet a few of you are smiling wistfully right now, secretly yearning for The Days of Boxes and Green Plastic: the expansive surfaces of glistening unblemished flowcharting paper, each patterned page awaiting its chance to represent pure logical art. What mere "problem" could possibly withstand our iterative onslaught of ink and thought? Get thee behind me, General Ledger!

Yes, they were simpler days, or perhaps it was just me who was simpler. Ah, but those first tastes of process abstraction (imposing order upon thought, what a concept!) were just too alluring.

My first exposure to flowcharts wasn't until college. I know for a fact that I was much simpler then, but fortunately so were the programming problems I faced. There always seemed to be a way to get that virtual boxcar attached to the virtual train without having to lift it off the virtual tracks. No list went unlinked, no record went unwritten, and no parameter went unpassed, by value or by reference. Simpler days, indeed…

When I look back at my proudest individual programming achievements, I can't help but start with that first college-level Pascal programming course. The instructor was meticulous and unwavering: no global variables without solid justification (which meant no global variables), all local variables descriptively named and declared alphabetically, and every procedure well begun with a standard commentary prologue.

That's how they lure you in. "Come on! Here! Impose order on an unruly universe… You can do it!" Yes, that was my first foray into flowcharting, and something in me changed.

I remember rushing to my then-future wife one bright summer day, waving my multipage fanfold printout, and proudly exclaiming, "Look! This Pascal assignment took over a HUNDRED LINES of CODE! Isn't that AMAZING!?" She smiled, and I fell in love (which is the only hard proof in existence that I do, in fact, have moments of brilliance).

Next it was a thousand lines of this and a thousand lines of that – logistic equations, with variable zooming, grid lines, and decimal input fields; fractal monster functions, continuous yet nowhere differentiable; images of reality that no one in the history of man could ever have seen in the days before transistors on silicon. I came to know the Turbo Pascal graphics library by heart. Programming these ugly beige boxes to display such unfathomable beauty was reaching deep into the viscera of the silicon beastie and twisting. I liked it. I was hooked on programming.

Then I got a job, and it was my guts' turn to be twisted… "Oh, Mandelbrot sets are fascinating and beautiful and all, but we really need that big honkin' component test plan you promised us. Okay?" The joy of individual, top-to-bottom programming – just for the fun of it – was still there, but there was also a different, even better, kind of joy: the joy of contributing to something much, much larger.

My first big chance to prove myself part of the team was during the development of a new optimizing compiler back end for our box. The theory of compiler front and back ends was new to me then, though its simple elegance was instantly compelling.

The idea is simple: separate the compilation process into two phases – a "front end" and a "back end." The front end converts source code to an "intermediate representation" (IR) – a form that completely and unambiguously represents the form and function of the compilation unit, but which does not presuppose any particular hardware configuration. Then, a compiler back end gets involved, and converts the IR into optimized, hardware-specific instruction streams and data structures.

The sweet part is this: any software that can be compiled into a given IR will run on any hardware that has a matching back end. Now, if this sounds familiar, it should. It's arguably the very heart of the write-once run-anywhere promise of Java.

At the front end, we have javac, Jikes, or anything that generates proper bytecode. (There is at least one RPG-to-bytecode compiler, for instance.) The IR, of course, is the classfile format. The back ends are the various JITs, AOTs, and true interpreters that make our JVMs work so well.

Imposing order upon thought… What a concept! Maybe those boxes and arrows and diamantine decisions led somewhere after all.

AUTHOR BIO
Blair Wyman is a software engineer working for IBM in Rochester, Minnesota, home of the IBM iSeries.

blair@blairwyman.com

Java Dudes

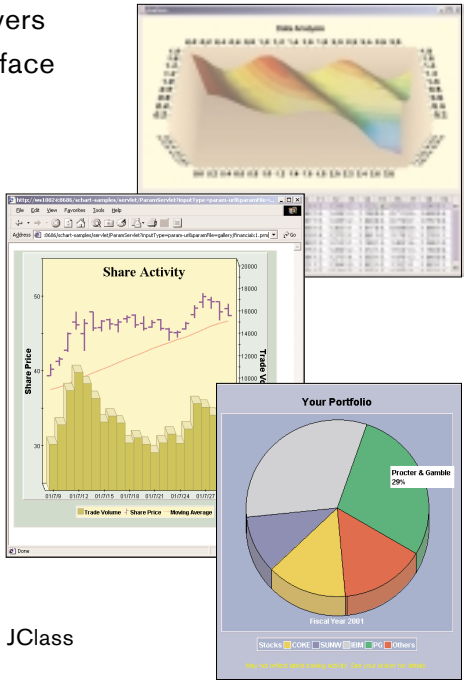
STORY CREDIT: FRED GROTT

The ultimate Java™ server and client components

JClass®

Now part of QUEST SOFTWARE

JClass is the only professional-quality Java component family that covers every facet of Java development – sophisticated client-side user interface components, reporting and utility components, server-side web client components, and web services ready components. With unrivaled platform, JDK, web/application server and IDE support, JClass works everywhere your application does, or will.



JClass DesktopViews

The only components you need for Java applications and applets: 2D/3D charts, tables, reporting, data-entry fields, database, tree view, layout managers, and much more. Build enterprise-class user interfaces quickly and cost-effectively.

JClass ServerViews

Now fully XML and Web Services ready! Add professional, dynamic content to your Servlet, JSP, or J2EE applications. Generate interactive charts with JClass ServerChart and dynamic PDF documents and reports with JClass ServerReport.

Evaluate and experience JClass for yourself – visit:

www.sitraka.com/jclass/jdj

sitraka