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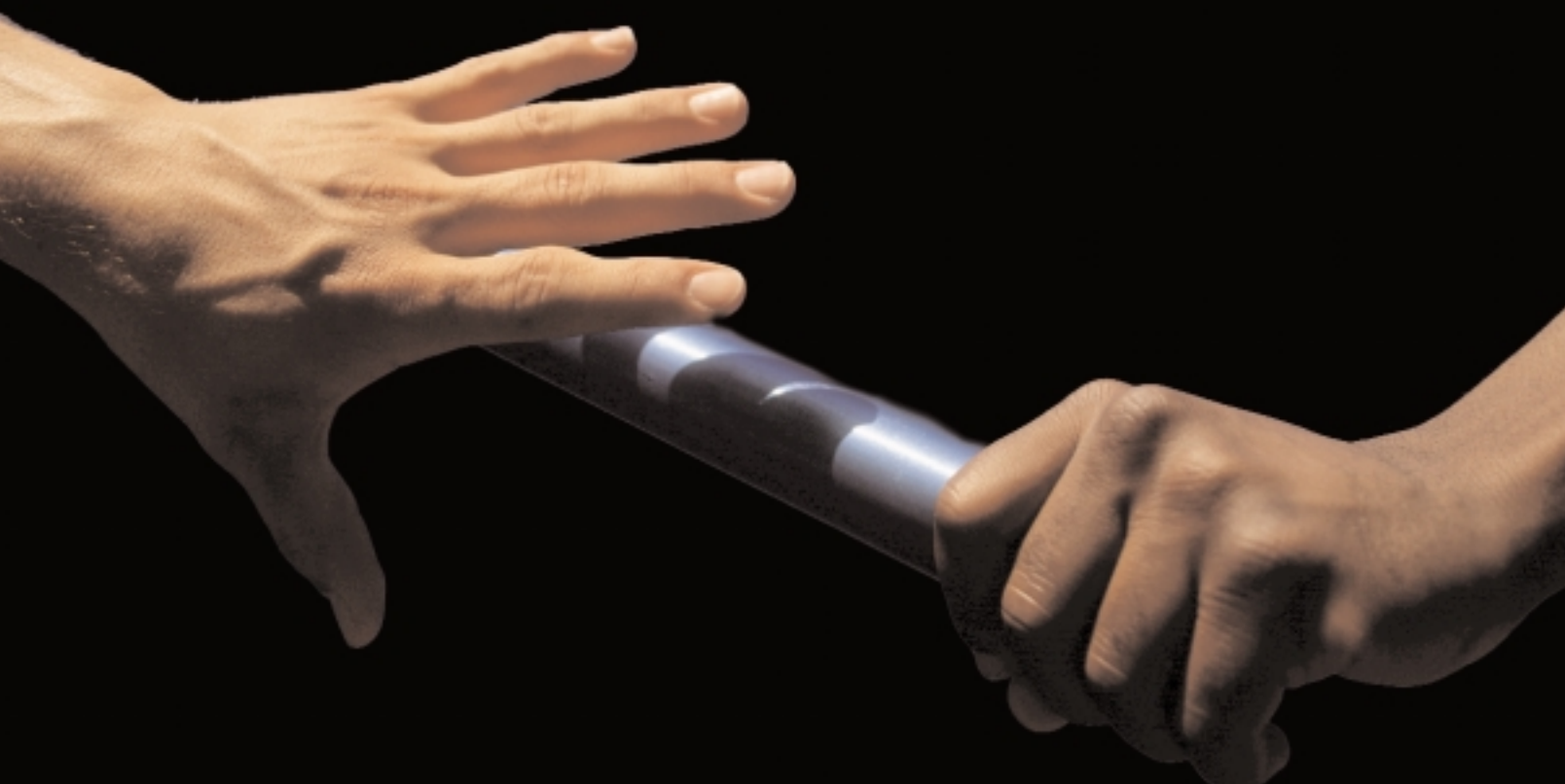
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Independent tests show the Power Mac G5 edges out the competition on integer and blasts past them in floating-point.



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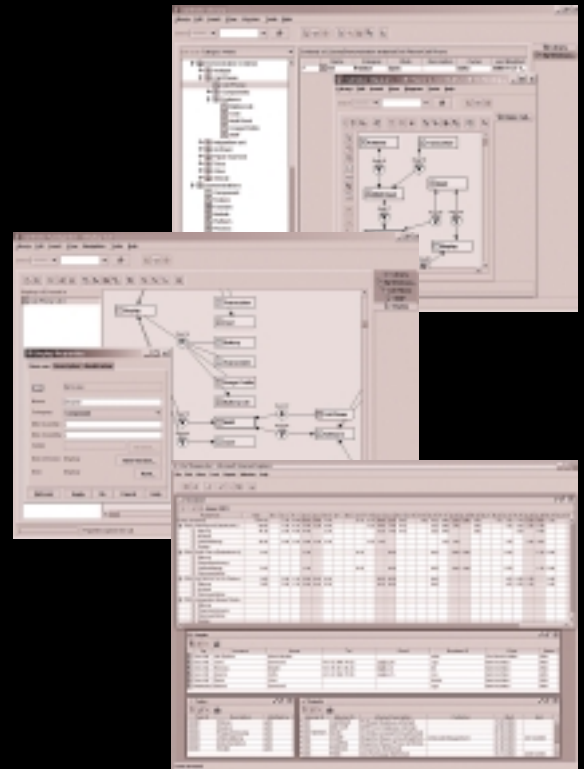
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We Soldier On

Many readers ask how we do it and what it takes to bring each issue of *JDJ* together every month.

I am fortunate to be part of a great team at *JDJ*. We hang out regularly in an IRC chat room, exchanging ideas and thoughts, and helping each other. Most of the magazine is constructed and planned from this “infamous” chat room; while we are strewn all over the globe, each of us in separate time zones, in our heads we’re all sitting around the same “virtual” table. When a story breaks, we’re available to react immediately. It’s a different sense of community than you get from e-mail – a lot more personal and not as cold.

Our respective employers are getting the benefit of a global support team should any of us get stuck with a problem. It’s a beautiful thing and if you’re part of a small engineering team, you should get into a chat room and open up your horizons and exchange ideas.

We all follow different areas of the Java spectrum and if there’s something that has caught our attention, we share it and dissect it. We read and comment on many blogs and forums, and it’s a great honor for us that one of the more famed bloggers, Hani Suleiman, has written this month’s **Viewpoint**. I urge you to read Hani’s editorial and then check out his blog site, which is a little more animated. He treads where others dare not.

While I’m on the subject of must-reads in this issue, check out Jason Bell’s editorial, “A Modern-Day Cinderella,” where he shines the spotlight on the core Java edition: J2SE. I couldn’t agree more with Jason, and at this year’s JavaOne, Sun hinted at a better branding of the editions.

The Java landscape is changing and we’re preparing *JDJ* to change with it. We’re in the process of breathing life

into a couple of new sections and are branding another. We’re looking to broaden the readership and not exclude those who are new to Java from learning something different each month, irrespective of their Java expertise. We have found a great addition to the editorial team who is no stranger to these pages – Joe Winchester, from IBM, will be our desktop editor and together we’re feverishly carving out this new section.

The *JDJ* Advisory Board is very active and to reflect these changes we are proud to announce an addition to the family: Thorsten Laux, desktop strategist from Sun. He’ll be making sure we’re heading in the right direction.

JDJ has gone through many changes and people in its time, a reflection of the evolution of the Java language. If you ever wonder how far we’ve come, dig out your old *JDJs* and read some of the articles from six years ago. It’s amusing to read some of the dreams and aspirations we, as a community, had. For example, notice the discussions around applets and all the things we could do with them. But did we? No. We let Macromedia slip in and grab the limelight from right under us with Flash.

Naturally you wonder what we’ll be kicking ourselves for in six years. Will we have let Microsoft creep in and steal our thunder with C#? Will Java have fragmented in much the same way C did, with different versions?

I think we’ve learned our lesson with the whole applet-Flash incident. We’ve done a sterling job of dominating the enterprise space and continue to thwart the attempts of Microsoft to gain a foothold.

But we can’t be complacent as the fight is never over. Competing technologies just make us strive harder as we aim to provide the best possible solutions to existing and emerging problems. ☺

Alan Williamson, when not answering your e-mails and working on the next issue of *JDJ*, heads up a small team dubbed the “Thunderbirds of the Java industry,” providing on- and off-site rescue for Java projects in trouble. For more information visit www.javaSOS.com. You can also read his blog: <http://alan.blog-city.com>.

alan@sys-con.com

Live and Let Live

Hani Suleiman

Over the past few years, the phenomenon of open source has risen to its rightful place in the hearts and minds of developers everywhere. You'd be hard pressed to find a Java project that doesn't make use of some form of open source software.

Nor is the prevalence of open source the domain of commodity applications; some highly specialized and domain-specific applications are open source, deployed in many high-profile, mission-critical environments, with a thriving and active user community. The motivation for the developers ranges from scratching a personal itch, to marketing benefits, to a (sometimes!) sound business model whereby the source is free but support and services are not.

Before open source advocates get up in arms over what I am about to say, I'd like to point out that I am heavily involved in quite a few open source projects; for example, as a core developer at the Open Symphony project and a regular contributor to XDoclet. I benefit greatly from a large number of open source products and libraries. This relationship is often quite symbiotic; the more you use said libraries, the more likely you are to contribute patches, fixes, and enhancements.

However, it's disturbing to hear some of the language and the tone coming out of certain vocal open source proponents in the Java world. I think a great disservice is being done to open source when those invested in it claim that it's a new business model that does away with the old antiquated way of doing things.

For all those adherents to this dogma, consider your own projects. If you're working on a product for a living (or hope to make a living off of it), chances are you're not going to open source it. Marketing benefits aside, it often doesn't make sense to "set the source free." Many man-hours have been invested in said product and, generally, financial compensation for investing all those hours wouldn't be such a bad thing.

Having said that, in some cases there is a great benefit to be had from

open sourcing. Perhaps you no longer have much time to dedicate to your application; perhaps it's too unrelated to your core business, and thus open sourcing it won't detrimentally affect sales. These days, it's also an excellent way to generate publicity and free marketing.

I've heard far too many people chant the usual set of mantras when it comes to choosing open source. For example, a common claim is that if you have access to the source, you can always fix any issues you have with it, thus having insurance against the vendor going out of business. This might well be true for small easy projects but, as most people who have used JBoss can attest, the source is next to useless in such scenarios. The codebase is simply too large and complex for the casual browser to be able to pinpoint a bug and determine a correct fix.

Another common myth is the superior support argument. The perception is that open source has superior support since it has interested fellow users and the actual developers of the code providing this support. This is an unfair claim because the stereotypical yardstick comparison is usually a very narrow set of commercial software. In my experience, almost every small vendor of a commercial product has provided exceptional support. Even the giants like BEA provide surprisingly quick-issue resolution and turnaround times. It's not unheard of to have an issue escalated to a senior engineer within a few hours of reporting it. Some clients have also cited very specific examples of issues not just being escalated, but having had a fix tested and delivered within hours.

Whatever your choice is, have the courtesy and foresight to acknowledge that there is no "one size fits all." Open source has its place now and always will. The same applies for commercial software. Neither model is going to die out anytime soon, but if you must make a decision between one or the other, consider all the hidden costs, not just the price tag. ☺

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Joseph Ottinger
J2EE Editor

Where Are the Components?

Sun's 10,000,000 developer mark is annoying me. I was surprised they had the gumption to say it in the first place and, as it sinks in, the implications are staggering. The implications aren't new, mind you – Sun also admitted they'd dropped the ball on marketing Java. It's just become more surprising to me over time.

Why? It's an admission that Java has had a lot of trends enforced that simply haven't worked, and won't work. I give you JavaBeans, EJBs, and a popular Web framework as examples.

JavaBeans were meant to be the drag-and-drop that brought the VB developers into the fold, with simple descriptions of use and parameters, easy deployment, and even state management. Lo and behold, now they're largely relegated to being a simple guideline for how methods and constructors should be built.

EJBs were the answer to distributed computing, with a promise of massive scalability. Soon, huge swaths of their specification were being avoided because of performance bottlenecks and complexity. Sure, you can get some of their promise out of session beans, and message-driven beans are easily my favorite aspect of the EJB spec, but getting good performance out of stateful beans or entities can be a fine art in and of itself.

Struts...oh, Struts. Tools for helping people build Struts applications can be found in every nook and cranny nowadays, and nobody questions why people are marketing tools and not components. If I want to build a simple process with Struts, I now have what seems like dozens of options to help me build that process, but who's willing to market a component to handle the process itself?

This strikes at the heart of the issue for me. Where are the components? There are reporting toolkits and some widgets for Swing, but where are the processes? Who's propagating knowledge of the EJB components that handle the gruntwork? Where are the Web services to allow the distribution of processes over nonhomogenous net-

works? Why are we still doing everything ourselves?

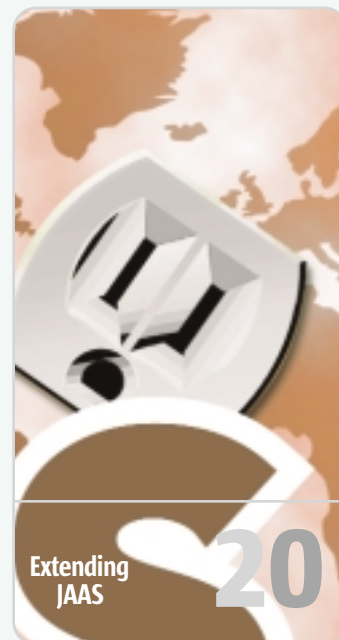
Until this can be answered, there's no way Sun has a chance to bring in all those developers. I know there are exceptions: Web services certainly do exist but, honestly, in my last five client installations, nobody mentioned them as an alternative even once, except as a nonviable one. I'm willing to admit that maybe I'm in a region that specializes in the "Not Invented Here" syndrome, but I don't think so – I've been at too many disparate clients for that.

What people are willing to invest in, financially or emotionally, are frameworks that still manage to leave the burden of work up to them. While that's comforting in the sense that I feel more valuable when I'm cranking out basic components (as opposed to simply tying components together), I think it's an underusage of the industry's capabilities. That means that we, as Java programmers, end up spinning our wheels in an attempt to be relevant, individually, instead of leveraging the very technology we've invested in.

After all, this is the stuff that J2EE was designed for: take specific functionality, allow it to be modular, and composite solutions together with ready-made tools. An EJB that processes an order can be written to handle a generic customer, a generic order, and a generic list of items, and can handle payment with a pluggable tool – and such an EJB, written well, would certainly be worth investing in instead of paying a developer to write yet another order-handling bean that can only accommodate the current requirements.

We still don't see it, though. I think this kind of sea change will be necessary, not just for J2EE, but for Java as a whole. At some point we have to stop falling in love with Java and start doing something with it. The capability is there. We just have to decide to imbue it with power.

It's time we started writing reusable components and distributing them. Otherwise, we as a community of developers end up squandering the power of the tools we have. Let's get to it. ☛



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Where Are the Components?

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Accessing MBeans Through the Jini Service

A complete understanding of the interactions among self-healing strategies would provide architects of distributed systems with the knowledge necessary to build the most effective catastrophe-free network system with minimum overhead. A self-healing, manageable distributed system can be developed using a Jini federation. Since Jini is focused on service-oriented programming and supports the discovery of services, active or dormant, identifying service failure and recovering from a major disaster is possible.

Joseph Ottinger is a consultant with Fusion Alliance (www.fusionalliance.com) and is a frequent contributor to open source projects in a number of capacities. Joe is also the acting chairman of the JDJ Editorial Advisory Board.

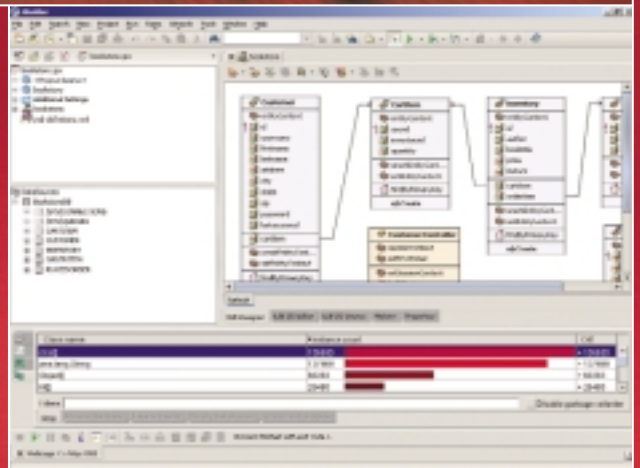
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Accessing MBeans Through the Jini Service

Attain a self-healing and intelligent network



Frank Jennings

Network systems based on service discovery can provide a consistent view of their distributed components even during changing network conditions. The ability of a system to heal itself during a network catastrophe, including architectural change and system breakdown, will help the system to realign its content traversal route intelligently and swiftly. This ability can be obtained from various healing strategies like failure detection, consistency maintenance, and distributed service activation techniques.

A complete understanding of the interactions among self-healing strategies would provide architects of distributed systems with the knowledge necessary to build the most effective catastrophe-free network system with minimum overhead. A self-healing, manageable distributed system can be developed using a Jini federation. Since Jini is focused on service-oriented programming and supports the discovery of services, active or dormant, identifying service failure and recovering from a major disaster is possible.

As a rule of thumb, a network system is not complete if it's not manageable remotely. Hence there should exist

a framework for exposing the application or Jini service for remote configuration. MBeans do just that.

Accessing MBeans from a different VM or a remote location can be done using a protocol adapter or connector. Connectors are similar to protocol adapters but they need the presence of a wrapper at both the server and the client sides; adapters are software, listening on the server side, built on a common protocol that the client is expected to understand and access. The JMX agent that starts the MBean server should let remote clients invoke methods on the MBeans registered in the MBean server.

The conventional way of accessing the MBean server from a different location is by using an RMI connector. RMI connectors are inherently MBeans registered in the MBean server. The remote client can access the MBean server using the RMI connector client. While this seems to be a neat solution for remotely accessing MBeans, the client needs to know the physical location of the MBean server. Even if the the MBean proxy is bound to a lookup, the client should know the lookup location. Even when using protocol adapters like the HTML and SNMP adapters, the client is expected to know the server location.

Consider a typical setup, such as a distributed content management system running on an agent framework, where the publishing server doesn't need to know where the content updating modules are running since it can be run by an editor, writer, or a designer in different locations. Implementing a simple connector does not solve this problem. This article explores the possibilities of using a discovery mechanism to find out where the JMX agent is running. This can be achieved by using a Jini connector, which is registered as an MBean with the MBean server.

However, we don't actually discover a running JMX agent but we discover

the Jini lookup service that holds the proxy of the Jini service, which is also registered as an MBean with the MBean server. Figure 1 shows the MBean invocation process between two different VMs.

Management Through MBeans

An agent application is a piece of software written in Java that contains an MBean server and interfaces to access its functionality. This would be a minimal agent and anything less couldn't be managed. In our example of a minimal agent, we'll access the MBean server through the HTML protocol adapter from a Web browser and also through a Jini client running in a different VM. Jini is a Java-based network federation where the services that want to expose themselves to the clients register themselves with a lookup registry, and the client that needs to access the service discovers the service through the lookup registry and invokes its methods. Since MBean is not serializable, a Jini connector wrapper registers the proxy with the lookup service.

Discovering MBean Agents

A JMX client can access and manage MBeans exposed by the MBean agent running in a different VM through various known techniques. The JMX Remote API (JSR 160) proposes a viable solution to remotely access an MBean agent. Hence it's possible for a remote client to get a reference for the JMX Remote API Connector. But a JMX Remote API can be used only when you know where the MBean server is running. The standard does not provide any solution for discovering MBean agents. Instead, you can try traditional service discovery processes like Jini lookup and Service Location Protocol (SLP). SLP is an IETF standard that provides a framework for allowing networking applications to discover the existence, location, and configuration of networked services in the network.

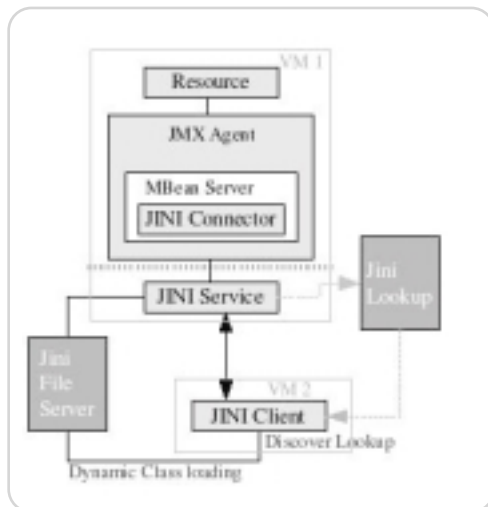


Figure 1 MBean invocation between VMs



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But the Java SLP Implementation (JSR 140) is still being tested.

Reggie for Discovering Agents

The Jini framework provides a reference implementation of a lookup service called “reggie” that holds service references and enables remote clients to discover it and get the remote service reference. It’s very simple to discover a running Jini lookup service using API calls. The service, which intends to be a part of the Jini federation, registers a serializable object with the lookup service, enabling remote clients to use this object as a proxy. Another advantage of using Jini is that the classes required for instantiating the proxy objects can be downloaded dynamically from an HTTP server, and the Jini framework provides the necessary security for code download based on the RMI security manager. Figure 2 shows the classes being downloaded from the client in our example application.

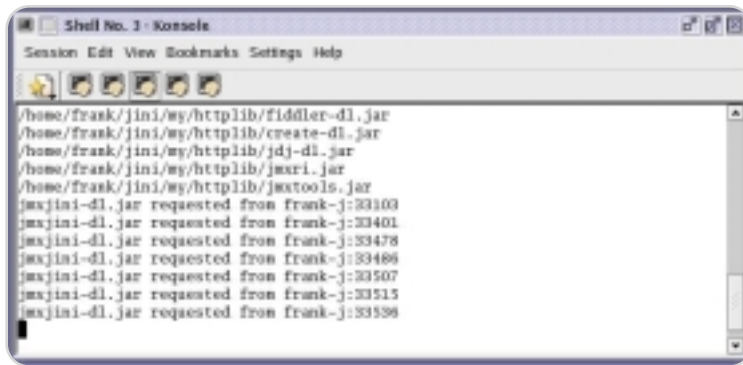


Figure 2 Classes being downloaded through an HTTP Server

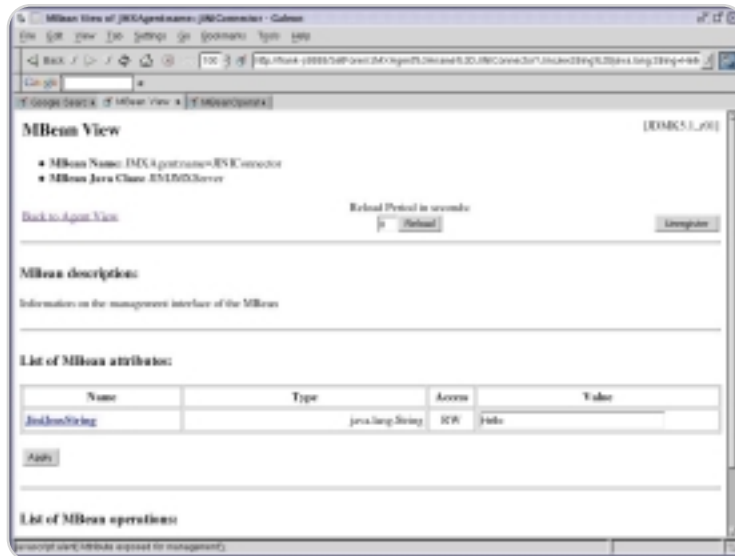


Figure 3 MBean view through an HTTP adapter

Setting Up a Jini Environment

In VM1:

1. Start the RMI Activation Daemon so the Jini lookup service can restore state after crashes.

```
rmid -Djava.security.policy=<policy_file>
```

2. Start the file server for loading classes dynamically. Use any HTTP server.

```
java -jar tools.jar -dir <lib_dir> -port 8678 -trees -verbose
tools.jar is a simple implementation of a HTTP server
```

3. Start the Jini lookup service for registering the Jini connector service.

```
java -jar reggie.jar http://<name>:8678/reggie-dl.jar <policy_file> <log_file> public
```

4. Start the JMX agent.

```
java -Djava.rmi.server.codebase=http://<name>:8678/jmxjini-dl.jar -Djava.security.policy=<policy_file> JMXAgent
```

In VM2:

1. Discover the JMX agent.

```
java -Djava.rmi.server.codebase=http://<name>:8678/jmxjini-dl.jar -Djava.security.policy=<policy_file> JINIJMXClient
```

Registering Services

In Jini the services can be registered through a serializable Java object or a stub. The stub provides a direct reference to the underlying Jini service. Since the Jini lookup service, which is based on RMI, automatically downloads from the server all the classes needed to deserialize the service object on the client, the server can register any class and the client can use the same class without having prior information of the class implementation. An easier way of registering services is by calling the `JMXConnectorFactory.newConnector()` of the JMX Remote API.

Accessing Remote Agents

By using Jini, a JMX agent can be distributed the same way as an RMI connector, but without mandating that the clients know the location of the running agent. Hence, to access a JMX agent, the clients can just create a Jini connector and locate the nearest running agent. If multiple agents are running on the network, the clients can select which agent they want to access

based on the lookup entry provided by the agent with the lookup service. The Jini connector can also advertise itself by using the default domain name of the MBean server in which it’s registered.

In this article we’ll build a simple Jini connector that registers itself with the MBean server and exposes the MBean agent for remote administration. Figure 3 shows the MBean list through an HTTP adapter showing the Jini connector and a configurable test string. The Jini connector is comprised of the service, which we want to register with the lookup service, the MBean, and a Jini client. Figure 4 shows the Jini lookup browser showing the Jini service class and the `JiniWrapper` registered with it. The MBean enables the agent to control the Jini service and, as you refer to the source code (which you can download from www.sys-con.com/java/sourcec.cfm), the MBean has a reference to the MBean server, which allows the Jini service to perform callbacks to the MBean server methods. The Jini client forwards its method invoca-

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Figure 4 Jini lookup browser

application to discover the lookup service running on the network and obtain the proxy of the Jini Connector service that enables the client to invoke the MBean server methods through callbacks. An excellent book to read, especially if you're new to Jini, is *Jini in a Nutshell* by Scott Oaks and Henry

activation daemon, enabling auto-restart during crashes, the Jini lookup service, an activateable service, requires RMID running on the same VM. So make sure the lookup service and RMID are running in the same VM. The Jini connector service can be run in any VM as long as the correct server codebase is specified for dynamic classloading. When the client gets started, it finds out the lookup service and hence the agent, and tries to get the MBean registration information, MBean count, and the test string value. It also dynamically changes the value of the string that can be viewed in a browser (see Figure 2). The output of the client is shown in Figure 5.

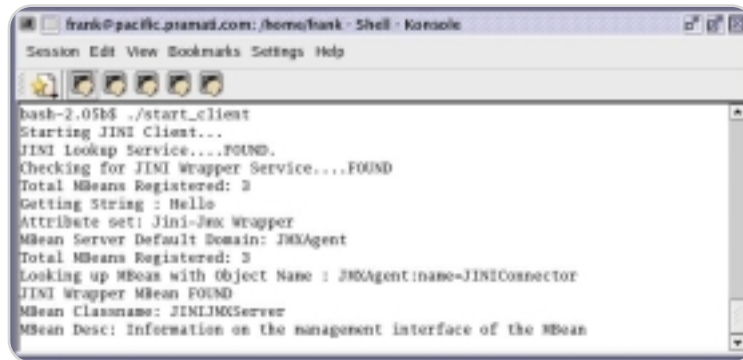


Figure 5 The Jini client process

Conclusion

MBean provides a powerful interface for managing services. Jini extends the functionality of MBeans by letting the client discover the JMX agent in a network on the fly. And since the agent is pulled into the Jini federation by the Jini connector service, other advantages like agent failure notification, event mailbox, and dynamic service reconfiguration are possible for attaining a true catastrophe free, self-healing, manageable, and intelligent network.

Frank Jennings is an electronics engineer from Madras and works for the communications design group at Pramati Technologies Ltd. He writes the column "Frank's Java Code Stack" for the *JDJ Industry Newsletter*.
frank@pramati.com

tion to the MBean server via the Jini service. The Jini client-side application discovers and uses the Jini connector service and therefore can use the agent.

An Example

The example source code provides a basic way of enabling the Jini client

Wong; to learn the basics of JMX, read *JMX in Action* by Benjamin G. Sullins, Mark Whipple, and Ben G. Sullins.

The process of setting up a Jini environment can be frustrating at times. For this reason, I've provided some instructions (see sidebar). Though our service does not register with the RMI

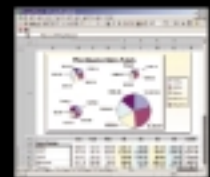
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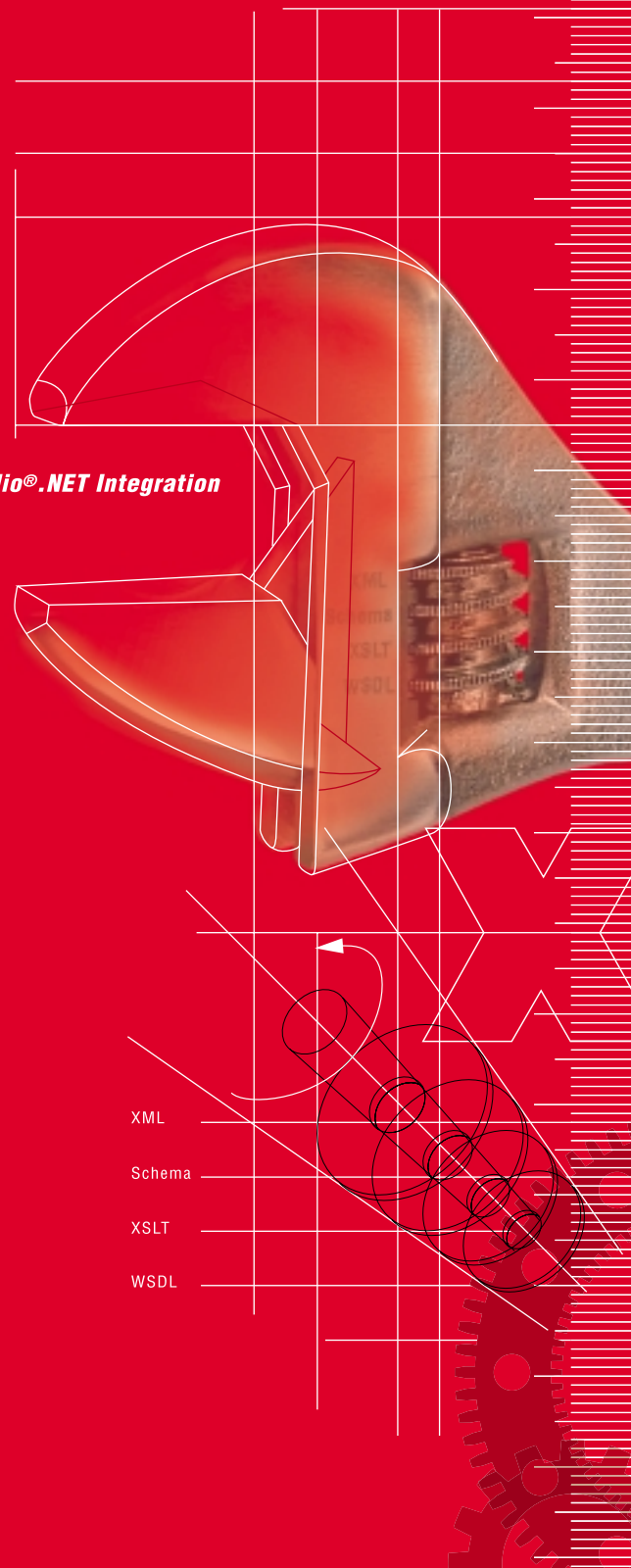
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Extending

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AN EASY WAY TO PLUG JAAS INTO YOUR APPLICATIONS

User authentication and access control are important security measures for most Java applications, especially J2EE applications. The Java Authentication and Authorization Service (JAAS), the core API of J2SE 1.4 and 1.5, represents the new security standard. It provides a pluggable and flexible framework that allows developers to incorporate different security mechanisms and various security sources.

With the upcoming release of J2SE 1.5, which includes a lot of enhancements to cryptography, XML security, Public Key Infrastructure (PKI), Kerberos, and the federating identity, the JAAS will play a more important role in J2EE security implementations.

Overview of JAAS

Authentication

Authentication is the process of verifying that a user has the right to use identities established by the enterprise user registry. The authentication mechanism of JAAS is built on a set of pluggable modules (see Figure 1). JAAS allows different authentication models to be plugged in at runtime. The client applications always interact with JAAS through the LoginContext object.

The authentication process typically involves the following steps:

1. Create a LoginContext object. The LoginContext looks up the configuration file to determine which LoginModule to use. Also, optionally, you can pass a CallbackHandler to the LoginContext.
2. Perform authentication by calling the login method of LoginContext, which loads the predefined LoginModule to check if the user can be authenticated.
3. Associate principals and credentials with the Subject if the user is authenticated.
4. Or throw a LoginException in case login failed.
5. Use the logout method of LoginContext to log out.

The login in JAAS is a two-phase process. The first phase is the "login" phase (as described in step 2). The only task in this phase is authentication. Once the process successfully passes this phase, the authentication process enters the

"commit" phase (step 3) in which the commit method of LoginModule is called to associate the relevant principals and credentials with the Subject.

A Subject in JAAS represents an authenticated entity, such as a person or device. It contains a set of principals and security-related attributes such as a password and cryptographic keys. In the JAAS architecture, the Subject, along with the Permission, plays an important role in the authorization process.

Of all the authentication modules, the LoginModule is the interface to a particular authentication mechanism. Although the LoginModule never gets called directly by the client application, it provides a particular type of authentication via a pluggable module, which implements the authentication algorithm and determines how the actual authentication is performed. Sun provides a few default LoginModule implementations, such as JndiLoginModule, Krb2LoginModule, UnixLoginModule, and NTLoginModule under the package of sun.com.security.auth.module. Since the JAAS login architecture is extensible, you can pretty much "plug in" any LoginModule just by specifying which LoginModule to use in the configuration file. An example of a configuration file looks like this:

```
MySample {
    com.sample.module.MyLoginModule required debug=true;
};
```

Here MySample is the name of the login context, which is passed into the LoginContext constructor when you create a new LoginContext to start the authentication process, followed by the configuration block. The block informs JAAS about the loginModule that should be used to perform authentication during the login. In addition to the LoginModule, any options to that LoginModule can also be specified here.

During the login step, the CallbackHandler is used by LoginModule to communicate with the user to obtain authentication information. The CallbackHandler handles three types of Callbacks: NameCallback, which prompts the user for a user name; PasswordCallback, which prompts for a password; and TextOutputCallback, which reports any error, warning, or other messages sent to the user.

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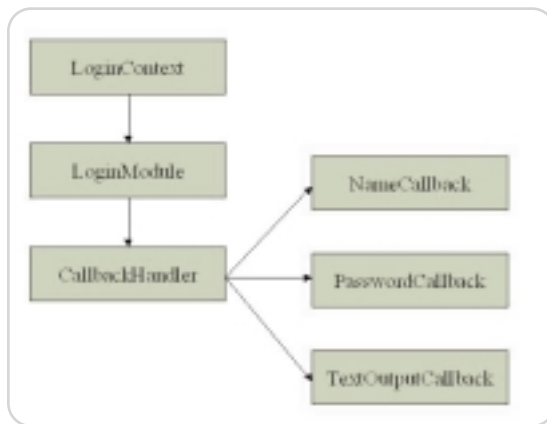


Figure 1 Modules of authentication in JAAS

Authorization

Authorization is the process of determining whether an authenticated user is permitted to perform some actions, such as accessing a resource. The process is policy-based since JAAS is built on the existing Java security model. The policy configuration file essentially contains a list of entries, such as “key-store” and/or “grant”. The grant entry includes all the permissions granted for the authenticated codes or principals to do the security-sensitive operations, for instance, accessing a particular Web page or local file. JAAS supports principal-based policy entry. Permissions can be granted in the policy to specific principals. The basic format of a grant entry looks like this:

```

grant Codebase "codebase_URL" Signedby "signer_name,"
  Principal principal_class_name "principal_name",
  Principal principal_class_name "principal_name",
  ... {
  permission permission_class_name "target_name", "action",
  permission permission_class_name "target_name", "action",
  ...
  }
  
```

The “action” may be required or can be omitted depending on the permission type.

In the JAAS architecture, the Policy object represents the system security policy for a Java application environment and there’s only one Policy object in effect at any time according to the Java 2 SDK document. The default implementation of Policy is `sun.security.provider.PolicyFile`, in which the policies are specified within one or more policy configuration files.

Once the user is authenticated, the authorization takes place via the `Subject.doAs` method, or the static `doAsPrivileged` method from `Subject` class. The `doAs` method dynamically associates the subject with the current `AccessControlContext` and then invokes the `run` method to execute the action, which causes the security checks. The permission check process goes through the following steps illustrated in Figure 2:

1. Invoke `Subject.doAs` (or `doAsPrivileged`).
2. Call `SecurityManager.checkPermission` or other check methods to check the permission.
3. The `SecurityManager` delegates the check to the `AccessController`.
4. The `AccessController` ensures the relevant `AccessControlContext` contains sufficient permissions for the action to be taken.
5. The `SecurityManager` updates the current `AccessControlContext` with the permissions granted to the subject via the Policy from the policy file.

If the required permission to a specific principal is granted, the operation will be allowed. Otherwise, an `AccessControlException` will be thrown.

Like the `LoginModule`, the `Policy` is also a pluggable module. You can hook up other `Policy` implementations by changing “`policy.provider=sun.security.provider.PolicyFile`” in the `java.security` properties file to a value of the `Policy` class you want to use.

Extend JAAS

JAAS is built on top of the existing Java security model, which is `CodeSource`-based, and the plaintext format policy file implementation. This may not be enough for the enterprise application. You may want to use custom security repositories with JAAS, such as LDAP (lightweight directory access protocol), database, or another file system. It can be done by writing your own customized modules, thanks to the JAAS pluggable feature. However, this would require a good understanding of the modules and processes involved in JAAS, and you need to do a lot of coding to override the proper classes and take care of both the configure and policy files.

Ideally, we’d like to be able to extend JAAS in an easier way so whenever a custom security repository or different access control mechanism changed or needed to add, you could just develop and plug in the different small modules (namely, the adapters) to accommodate these new changes or requirements, and best of all, without having to understand or know the details of the JAAS process. Also, we would like to be able to make this change simply by changing a configuration file. Another goal is that our JAAS extension component could be used in different J2EE applications – stand-alone or Web.

Figure 3 outlines the design of our JAAS extension component.

Our JAAS extension component takes advantage of the JAAS pluggable architecture by implementing our customized `LoginModule` and `Policy` modules. In these modules, we delegate the data requests to the adapters. Each of these adapters is isolated to simple tasks such as data retrieval, so you can rapidly develop different adapters for different security repositories or algorithms instead of trying to implement different `LoginModule` or `Policy` modules, which are far more complex and require more effort.

You can download the complete source code from www.sys-con.com/java/sourcec.cfm.

AuthLoginModule

The `AuthLoginModule` class is our customized `LoginModule` implementation. The `LoginModule` is a pluggable component in the JAAS authentication process and serves two purposes:

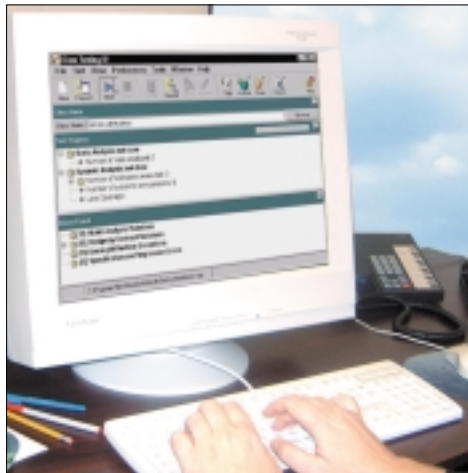
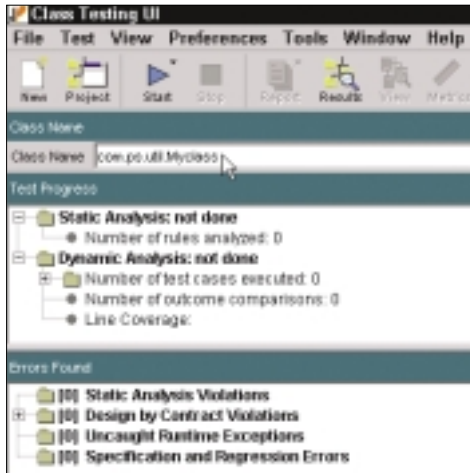
1. Authenticate the user.
2. Update the `Subject` with relevant principals and credentials if authentication succeeded.

The `LoginModule` has five methods to implement. Let’s look at the `login ()` method. This method is called to authenticate the `Subject` and basically does two things:

1. Obtains the user name and password. Typically, the `LoginModule` invokes the `handle` method of the `CallbackHandler` to get the user name and password.
2. Verifies the password against the one in the data source.

The `LoginModule` retrieves the username and password from the `Callbacks`, which, by default, expect some sort of user interaction. This is fine for a simple demo program or on the command line, but it may not be practical for a J2EE application. For instance, for most Web applications, the user

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name and password will typically be read from a form. In this case, using JAAS authentication will be difficult. Considering we don't use LoginModule directly, the solution is to implement a customized CallbackHandler, which accepts a username and password and then delivers them to the LoginModule so it doesn't need to prompt the user for the information. Here's how the user information got passed from the JSP or servlet:

```
String userName = request.getParameter("user");
String password = request.getParameter("password");
LoginContext context = new LoginContext("MySample",
    new AuthCallbackHandler(userName, password));
```

Once it has the user name and password at hand, the AuthLoginModule, our customized implementation of LoginModule, instantiates the LoginSourceAdapter via the LoginSourceAdapterFactory and delegates the actual authentication to the source adapter. The adapter is nothing more than a simple class, which pulls down the user information from a particular data source, such as database or LDAP, or some other system.

In the "commit" phase, the AuthLoginModule retrieves the relevant information from the LoginSourceAdapter and associates them with the Subject.

LoginSourceAdapter

The LoginSourceAdapter is an interface of source adapter for the authentication. It has four methods for required implementations:

1. **void initialize (Hashtable parameters):** The initialize method is called to initialize the adapter with the relevant parameters. The method is called immediately after object creation and prior to any calls to other methods.
2. **boolean authenticate (String userName, char[] password):** The authenticate method is called to authenticate the user.
3. **String[] getGroupNames (String userName):** The getGroupNames method is called to get the relevant principal information after authentication succeeded.
4. **void terminate ():** This method is called when the logout method of LoginModule is invoked. It gives the adapter a chance to do some clean-up work.

The argument for the initialize method is the collection of a key-value pair. It could be the parameters for database connectivity, such as driver, URL, user ID, and password, or other information required for your adapter. You can specify these parameters in the configuration file, which I'll discuss later.

AuthPolicy

Under the JAAS architecture, the security policy is handled by the java.security.Policy class, which establishes the various Permissions granted to a particular

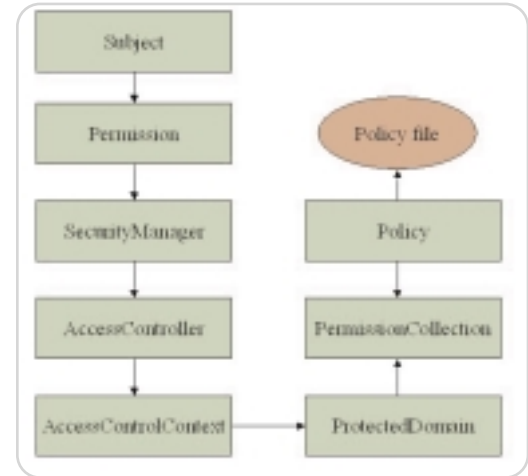


Figure 2 Modules of authorization in JAAS

CodeSource or Principal. As discussed in the previous section, the default implementation is sun.security.provider.PolicyFile. The PolicyFile uses the plaintext file to establish the mapping between permissions and CodeSource, which may not be good enough for the enterprise application. A centralized system such as a relational database for supporting role-base security would be better.

Obviously, to extend JAAS authorization to handle the different security schemes from different sources, we need to write our own Policy implementation.

The steps to create a customized Policy implementation are:

- Extend java.security.Policy.
- Implement getPermissions ().
- Implement refresh ().

If you look at the implementation of our customized Policy class, you may notice that our AuthPolicy class is derived from the sun.security.provider.PolicyFile instead of java.security.Policy. Why? First, I want to implement the AuthPolicy class as the generic Policy class, which can deal with the default policy file without any adapter plugged in. By deriving from the PolicyFile, we don't need to implement the policy file parsing and other related codes. Also, when the application is running with a SecurityManager enabled, a few permissions, such as doAsPrivileged AuthPermission and read FilePermission (for loading a configuration file), need to be granted in order to execute the JAAS. Sure, these permissions could be stored in the data source, but it might be convenient to put them in the standard Java security policy file. However, for serious development you should implement an adapter to deal with these issues.

Following the same design pattern in the extending authentication, our Policy class delegates the permission requests to the PermissionAdapter.

In the Permissions class, the different Permission is held in its own PermissionCollection instance. If you create a custom Permission class, you need to create your own

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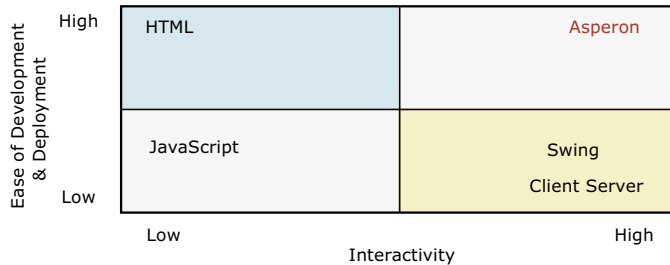
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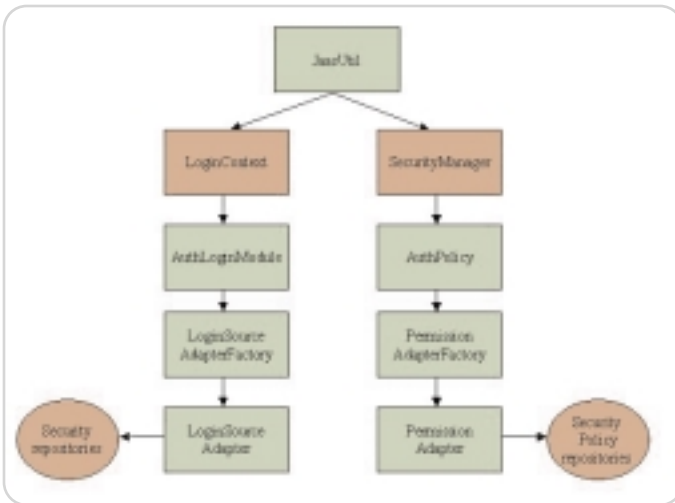


Figure 3 Outline of JAAS extension component

PermissionCollection, otherwise there's no guarantee that your Permission object will be consulted.

PermissionAdapter

The PermissionAdapter is the interface of the pluggable module for authorization in our JAAS extension component. It evaluates the policy from a particular data source and delivers a PermissionCollection that contains a set of permissions granted. The PermissionAdapter interface has the following methods:

- **void initialize (Hashtable initParams):** The initialize method is called to initialize the adapter with the relevant parameter. The method is called immediately and prior to any calls to other methods. Also, it's called when Policy's refresh is invoked.
- **PermissionCollection getPermissions (ProtectionDomain domain):** This method is called whenever the Permissions with particular Principals is requested.

As an example, let's look at how to implement a role-based PermissionAdapter. Assume that there are three roles: admin, user, and guest all with different privileges, and all the permission information is stored in the database.

First, in the initialize method, we'll retrieve all the permission information for all roles from the database table and populate them in the collection, e.g., Hashtable.

Next, in the getPermissions method, we'll collect the permissions that relate to the involved Principals (this is the only concern for the role-based access control) and return them. Note that we can get relevant Principals by calling the getPrincipals method of ProtectedDomain. It's so simple, isn't it?



JaasUtil

JaasUtil is the main contact to our JAAS extension component, and it has a constructor that takes the user name and password. There are two key methods:

1. boolean authenticate()
2. boolean checkPermission(Subject subject, final Permission perm)

The JaasUtil actually defers the login request to LoginContext and the permission check to SecurityManager.

Listing 1 shows how to use JaasUtil. This code first gets the user name and password from the HttpServletRequest and tries to authenticate the user. Then it checks if this user has permission to access the "editReg.jsp".

Configuration

Now we have our customized implementations of the LoginModule, Policy, and other related modules. These modules can delegate the relevant data requests to the appropriate adapters; so far so good. However, in the JAAS architecture, the LoginModule and Policy are never directly invoked by the application, so how do we know which adapter should be instantiated and how to pass the necessary parameters or information, such as connectivity, to the adapters?

The answer is that the adapters can be dynamically configured by updating an XML configuration file. This XML configuration file consists of two major sections:

1. **<authentication>**: This section defines the login source adapter and possible input parameters for authentication.
2. **<authorization>**: This section defines the permission adapter and possible input parameters for authorization.

You can specify which LoginSourceAdapter and PermissionAdapter to use. It's also possible to pass additional information to the adapter in the configuration file.

There are two ways to let JaasUtil know where to look for the configuration file:

1. Specify the configuration file via the -Dcom.auth.config command-line switch.
2. Call JaasUtil.setConfigFile (configFile).

When you deploy the JAAS extension component, the customized security Policy class file must be added to Java's jre/lib directory, which will cause the policy class file to be loaded by the bootstrap class loader. Otherwise, it won't be picked up and the default policy class provided by Sun will be used instead, even though you placed the policy class file on the Java class path.

Summary

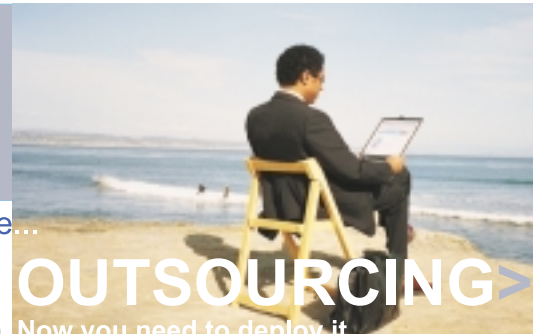
Extending JAAS is not difficult. The JAAS architecture provides you with the flexibility to customize the authentication and authorization processes. Understanding how these processes work is the first step in knowing how to "roll your own" implementation. In this article, we recalled the basics of the JAAS, and examined the details of how to extend JAAS to be a more dynamic, flexible, and scalable framework. With this extended framework, you can easily create your own login and access control mechanisms to support either your own enterprise-specific security requirements or emerging security standards, or leverage your existing or customized security models as the adapters, and then "plug" them into JAAS. This should provide a standard-based and highly customized authentication and authorization for your enterprise applications. ☺

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Jason Bell
J2SE Editor

A Modern-Day Cinderella

can contain my annoyance no longer. I've watched comments, blogs, and industrial news come and go; I've had sleepless nights and gone off my food.

My argument? The name "Java 2 Standard Edition" should be changed to "Core Java," from a marketing point of view. If there is one thing I've noticed over the last year or so, it's the growing belief that J2EE (the not-so-core Java) doesn't need the "Standard Edition," and I don't see much in the way of an explanation as to what's required to get all this technology working.

While at *JDJ* I've been standing on a soapbox and yelling about reading API docs and learning, teaching, and helping others. Now I get the feeling that part of the problem lies with Sun and how they encourage developers to download and learn the core principles of Java properly.

Since a lot of software development is Web based, the core API gets overshadowed by its bigger, well-dressed brother. J2EE drinks fine wines, goes to expensive restaurants, and drives nice cars. J2SE is merely forgotten, left in the corner to do the dishes. It's a modern-day Cinderella. Scott McNealy told everyone about Sun's 10-million developer expectation at his JavaOne keynote. All very nice, but if we don't really know which development kit to use to get our "Hello World" working, then there's a serious failure in communication that needs to be addressed.

I think we better look at the word "core"; the dictionary definition is: "The most important part of anything." I'll go as far as saying that the current development kit is at a stage where you could, if you wanted, create a decent application without external libraries from SourceForge or the Jakarta Apache project. The core API has logging, regular expressions, and XML handling. It's come of age; it's grown up a bit but it still feels like a misunderstood teenager.

Sun should put more emphasis on the core aspect of the Java language. In my opinion, this emphasis is missing at the moment while they are trying to win the hearts of the enterprise community (easy to see why they do that; that's where the money is). All very well, but it makes it difficult for new developers to understand the basic concepts of Java. If you point developers in the right direction, they tend to pick up the concepts and get on with it; confuse them and they tend to drop everything and moan. Don't tell me it doesn't happen – I see the lists, read the blogs, and listen to the conversations.

I've been talking to Alan a lot about getting back to basics in what we cover in the J2SE section of *JDJ*. The quality of the articles we have published is excellent and many more good articles will follow, but I noticed a lack of articles on core principles and working with the basics. As always there's an open invitation for anyone who wants to put something together to please send in a proposal (<http://grids.sys-con.com/proposal>). I know we've covered all the basic stuff before, but the API has changed and it's worth going over from time to time. There's no harm in a refresher.

I'm not in the area of Sun bashing, but I do think they need to revisit how they communicate their products, and how they encourage teaching the concepts (the Java Tutorials are looking a bit long in the tooth, but are still worth their weight in gold). If Scott McNealy can shout about Java as well as he does, then I'm sure there's something we can all learn from him when it comes to selling our wares on the Internet.

I just hope the dream doesn't become an "all talk and no action" problem that Sun will come back to in 12 months time, still trying to figure out why the developer numbers haven't increased as they had hoped. ☉



Customizing Ant

36

A Modern-Day Cinderella

I can contain my annoyance no longer. I've watched comments, blogs, and industrial news come and go; I've had sleepless nights and gone off my food. My argument? The name "Java 2 Standard Edition" should be changed to "Core Java," from a marketing point of view. If there is one thing I've noticed over the last year or so, it's the growing belief that J2EE (the not-so-core Java) doesn't need the "Standard Edition," and I don't see much in the way of an explanation as to what's required to get all this technology working.

Java Games Development

The discussion on Java games development continues with such topics as whether 85% portability is achievable in Java, which features of the Java platform make it a better choice for games development, and which features are missing from the API.

Jason Bell is the senior programmer for a B2B portal. He's also a keen supporter of people reading the API docs before asking questions. In his spare time he's involved with building RSS development tools.

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Java Games Development

Part 2 of 3

Part 1 of this series appeared in the August issue of *Java Developer's Journal* (Vol. 8, issue 8).

JD: I'd just like to pick up on that 85% portability goal Jeff mentioned earlier. I'm just going on assumptions, but I think if you were developing a title for the PS2, GameCube, and Xbox you would attempt to make sure that only the graphics and audio functionality were platform-specific and make the rest of the game as portable as possible. Seventy-five to eighty-five percent portability would therefore seem to be an achievable goal in C/C++, in which case Java has just lost one of its advantages, has it not?

Cas P: Usually I'm even more optimistic than Jeff about something here. I think I can achieve 100% portability. By focusing on a "pure Java platform" like the LWJGL (Lightweight Java Gaming Library), which, once you realize you're coding to the LWJGL Java API, not the underlying OS, you can achieve 100% portability with a little understanding. Technically, we're not "pure Java" according to Sun's definition, but when you look at the face value, what we have is a 100% cross-platform library with 100% open standards. We've got it working without glitches on Linux x86, and the Mac OS X port is coming along very slowly, as our contributor works for CNN and he's rather busy. I expect *Alien Flux* to run on the Mac once we get the Mac APIs – it won't run perfectly right now because I use only Win32/Linux-specific extensions. You still have to code for each platform, but you do it in Java, not in C. You have to know that `WGL_EXT_swap_interval` isn't going to be present on the Mac, and you'll need to call the Mac equivalent.

In Java 3D they've taken a more hide-it-away approach but this is a two-edged sword; on the one hand, programmers don't have to worry about the details of some aspects of cross-platform coding; on the other hand, it

The players are:

Jason R. Briggs: *Java Developer's Journal* contributing editor and your host.

Gerardo Dada: Metrowerks' product manager for CodeWarrior Wireless Studio.

Erik Duijs: Former musician/engineer/producer with a (games) programming passion, now an IT consultant. Author of the Java Emulation Framework (JEF) and CottAGE.

Shawn Kendall: Developed Java and Java 3D-based game technology demos for Full Sail, Sun Microsystems, and I.M.I. In 2002 founded Immediate Mode Interactive, LLC, a game technology company (www.imilabs.com).

Jeff Kesselman: Architect for game technologies, Advanced Software Technologies Group at Sun. He co-wrote *Java Platform Performance: Strategies and Tactics*.

Chris Melissinos: Sun's chief gaming officer and responsible for driving an industry-wide movement toward Java technology-based game development.

Caspian Rychlik-Prince: An IT consultant in the UK, who for the last 10 years has specialized in client/server systems with RDBMS back ends. He has just released a new game, *Alien Flux*.

Doug Twilleager: Chief architect of the Java Games Initiative at Sun Microsystems and one of the architects of Java 3D.

David Yazel: VP of software development of trading systems and portfolio management systems and a games developer for (and founder of) the *Magicosm* project (a 100% Java-based MMORPG).

relies on the closed and often complex C coding going on in the background.

Let's not forget that killer feature of Java – the ability to download chunks of code, in particular, game mods that don't need to be compiled for every different OS. New weapons, new special effects, dynamic patches...it's all easily possible. If I may make another cloudy prediction here, I don't believe we'll really see the advantages of this until two things come together: ubiquitous broadband and Java on consoles.

Oh, and OpenGL on consoles too...

I'd really rather like to get a hold of the PS3 development team and quiz them about OpenGL support. It won't be too hard to get OpenGL drivers running on PS3. Some GL features might well be very slow, but the ones we all use all the time will be very fast indeed. And, of course, all the PS3 hardware can be exposed by OpenGL extensions. Or perhaps OpenGL 2.0 is the way forward there.

Whatever happens, I'd like to see LWJGL on PlayStation, or even Xbox. Did you know that apparently the Xbox was developed using OpenGL drivers

hosted by
Jason R. Briggs

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from Nvidia? They switched to DirectX near the end because, of course, Microsoft didn't want that API in there.

Jeff K: I'm going to stick with 85% because I believe there is a qualitative difference between getting a demo running and a top-quality port of an A-line title. The latter, in my experience, invariably takes advantage of particular characteristics of the hardware platform. Since the hardware's performance characteristics are different, you'll probably want to retune the code. In addition, to be a top title you really want to show off the unique features of that platform. Between those two steps I'm thinking 15% of the code, but I might be overestimating. After all *CyberStep* *did* port what I consider to be an A-line title without a huge amount of work.

Designing portable C code is *hard*, thus it's a significant added expense. Look at poor Bioware with *Neverwinter Nights*; they were trying to write portable code. They used a "portable" graphics library (OGL) and it still has taken them close to a year to release their second platform (Linux) with their third (Mac OS X) still in development.

In contrast, we've already heard stories here of ports that took under a day in Java (*Alien Flux*, *Jamid*, *Magicosm*) and even when *Cyberstep* had to port their own native graphics and input bindings for *GetAmped*, they were done in a month.

I actually designed and maintained a portability layer in C for *Crystal Dynamics*. While you *can* write portable C code, it's actually quite difficult and requires a lot of diligence to keep it portable.

You run into all sorts of things you'd never expect. Just a few examples off the top of my head:

1. The size of types are platform-specific (how many bits an int is, etc.), requiring you to write your own type system on top of C.
2. Byte packing and endian conventions are CPU dependent in C, lead-

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ing to potentially incompatible data. There are some techniques for dealing with this with macros but again it's ugly, extra work, and diligence is required.

- The number of characters that are significant in an identifier is compiler-specific. (The standard only requires that it is at least 8. I had a compiler once that just truncated all my function names silently. It was 100% ANSI compliant.)

While you can write portable C/C++ code, it's difficult and the results are imperfect. Java has already empirically proved it's far better at this.

JD/: Are there any features of the Java platform that you believe make it a better choice for games development than other alternatives?

Cas P: It's just easier and that's fundamental – it's easier to make something that works correctly in Java. It's not necessarily easier to make something that works faster, and you can spend a lot of time and hassle finding out how to make things fast enough, but at the end of the day, the IDEs and debugging facilities in Java are absolutely stunning. It's like the difference between those horrible 9-pin Epson dot-matrix printers that infested the planet the last decade and the ink-jet printers of today.

and inner classes and Java's take on the OO concept, you can pretty much design beautiful, simple, correct, and efficient code without resorting to that ridiculous UML that seems to have become so popular. I've seen projects with only 10 classes specified in UML. I've got hundreds of classes in Alien Flux and I know just about every line in every class! It's just so easy to put it all together.

Shawn K: Simply put, the language features make Java a better choice for games development, which is often the same reasoning it's a better choice for nongaming development. However, much of what many developers consider the big Java gains (exceptions, excellent debugging, runtime analysis, etc.) are available with good C/C++ dev tools; it's just that they don't know about them yet and they cost \$\$\$.

GC (pointer control, illegal memory access), security, and portability are the last stand for Java's benefits in an ever-improving C/C++/C# world. And portability to the game developer is a bit "funny" in this space. For handheld game makers, Java is the clear choice due to portability. For PC/console, it's a different world. You can code C/C++ for a DirectX/PC game and port to the Xbox console, so in that respect C/C++ is portable. Java can't do this. You can, however, move your Java game across Linux/PC/Mac OS X *nearly*. But what is the gain there for the game developer? Linux and Mac are not a compelling

Ubiquity – related to portability but slightly different – in this case means that you can come to a new platform without learning how to code it from scratch.

David Y: I'm a big fan of Java, and that's after writing over a million lines of C++ in my career. Basically Java, as a language, offers many advantages over other languages. The quick list is: strongly typed, no pointers, single inheritance + interfaces (versus multiple inheritance), and portability. The JDK is a very rich API with many different sub-APIs that can shorten your development time (Java 2D, ImageIO, Java 3D, XML Parsers, etc.). For game programming specifically, Java is very nice for the organization and class hierarchy of your game system. Games are complex programs and it's that very complexity that begs for a language and platform that facilitates writing good code.

JD/: Following on from that last question, what features are missing from the API that are essential (or would just make life easier) for games dev?

Cas P: I'd like to see something very like the LWJGL ratified into a J2ME profile of some sort. It does what it says on the tin after all and, indeed, does very little beyond providing what a games developer needs to get down and dirty with drivers. We've got a vector maths API in

“For handheld game makers,
Java is the clear choice
due to portability”

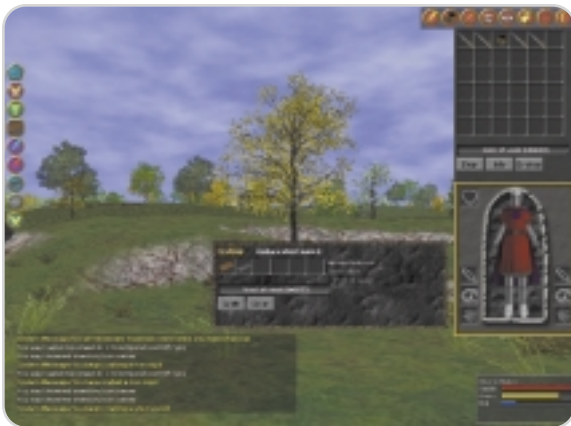
–Shawn Kendall

game sales platform. If “real” Java was available on consoles, the portability argument becomes a bit stronger.

Jeff K: Code correctness features provide major benefits in productivity and reliability of results. Late binding, which for the first time really makes reusable code work (and refactoring work), again leads to faster development and a more reliable product. Automatic code portability (be it 85% or 100%) is a terrific improvement from previous environments.

there but really this should have been part of the standard J2SE distribution by now. More generically than LWJGL, I'd like to see OpenGL become part of J2SE (although, see next answer, I'd like to see J2SE phased out). And OpenAL. OpenAL deserves support, lots of support.

If we could stray a little beyond the realms of purely API additions, I'd also rather like to see typedefs in Java. I noticed this problem when we were using ints as pointers in our LWJGL library. It's very easy to treat an int like



Magicosm - online role playing game

The IDEs available now – we all have our favorites, and I like Eclipse the most – are already more advanced than anything C++ has ever had to offer. This is due to one of the great unsung design wins in Java, which is its built-in debugging facility and, of course, all that lovely reflective information and stack tracing.

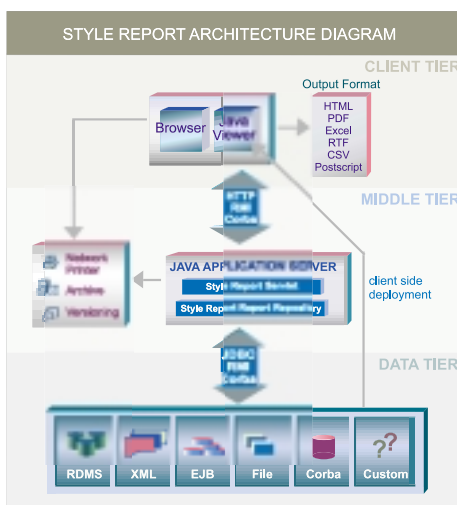
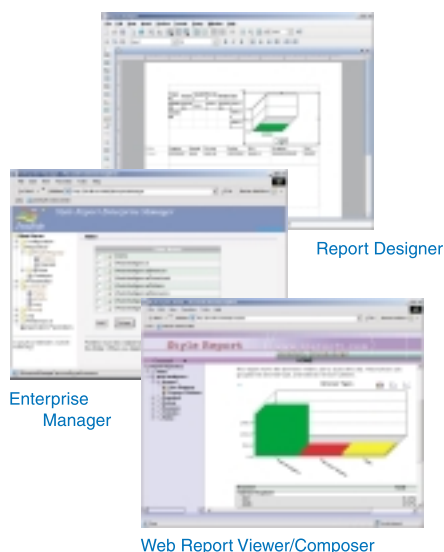
Of course, you could say debugging is just papering over the cracks in design but again, if you understand interfaces

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an int, and add 1 to it and so on (kerassshhh!), not to mention a bit of trouble with overloading method signatures that take enums and ints. We'd really like to have been able to typedef it and make it completely opaque but without the overhead of an object.

One reason typedefs are missing from Java is there's a large crowd of people who would like to think that Java is the only language that exists – the pure Java crowd. At the end of the day, people who are doing some of the more esoteric and interesting things in Java end up having to talk to the rest of the world in the same way the rest of the world is written – in C and machine code.

Then there's this other group of people who think that Java was designed for some purpose and that purpose shouldn't change over time. They largely overlap, but there's another group of people who want to see Java become ubiquitous, and who think there's no reason why you couldn't use Java to do systems programming. Sometimes this group even manages to overlap one or both of the other two! What's needed here is a thawing of the ice, a relaxation of principles. We need to realize that without some pretty serious evolution in the near term, Java will lose some momentum to languages that are

workarounds, when we all know that one of the most important fundamental design goals of a computer programming language is to get what you want done using a grammar that is concise, efficient, and easy to understand. A one-line enum definition is far easier to understand and maintain than 40 lines of inner classes defining a few typesafe enums.

I'd like to programmatically query capabilities of the VM and set them at runtime. I'd especially like to be able to query for and turn on incremental and concurrent collection and adjust heap size min/maxes, and I'd really like to be able to specify a millisecond-resolution throttle on concurrent collection activity and ask it to make an incremental collection at a specific point in time, during a SwapBuffers. This is pretty important. I do other things besides games with Java – I'm doing something for Abu Dhabi TV right now using the LWJGL; they need a caption-generation system. Unfortunately, as it's live TV I'm not allowed to skip a single frame ever. It's pretty scary having to worry about GC occurring. And it's very noticeable when it does.

Shawn K: Well, I would like to refer this question to the JGP (Java Games Profile) documents of the last two years. They say it all.

This last one isn't really an API but a language "nice to have": better support for efficient bit and byte twiddling.

Cas P: Talking of better audio support – we could do with Ogg Vorbis getting into the API somewhere. I think, as it is, the transparency support in Java 2D is fine; it's just not really well suited to the underlying graphics APIs. Maybe a shift toward an OpenGL-like approach to the Java rendering APIs is what's needed – designed for hardware acceleration but not a requirement; 2D and 3D done with the same API. There's a lot of stuff in the 2D APIs that is really, really good. Java's font rendering is superb (although it needs Cleartype rendering, and soon).

David Y: This is a tough one. Sun doesn't have a "Game API," so the question would have to apply to the platform and language. Structs would, of course, be very helpful in this regard since it allows us to communicate more effectively with lower-level APIs like OpenGL. Another one would be more control over those things that affect our ability to render a consistent frame rate. To me this means things like:

- Finer grain control over threading
- Higher resolution timer (which we sort of have in Java 3D 1.3)
- A much more efficient mechanism to

"We need to realize that without some pretty serious evolution in the near term
Java will lose some momentum to languages that are evolving in parallel"

–Caspian Rychlik-Prince

Jeff K: You can kind of just iterate down the list of DX features and check off what we don't have yet...things like Polled Controller Support, a standard way of hitting the rendering layer of 3D that includes cross-platform shader support and the ability to drop down to C code and do calls to platform-specific extensions, better game-networking support (a la DirectPlay), a way to get an environment up without pulling in all of the unneeded window manager stuff, better audio support, and some fixes/improvement to 2D (e.g., better transparency support).

get inputs (mouse, keyboard) because having it come through windows -> AWT -> Swing -> component -> gamesystem is awful and laggy and unpredictable

- Improved profiling
- Improved integration with JavaSound (i.e., MP3, etc.) with hardware streaming, midi, and synth – current sound uses too much CPU
- Finally, background file loading streams where we can more tightly control IO speed and CPU

Part 3 of this discussion will continue in the October issue of *JDJ*.



Magicosm - online role playing game

evolving in parallel. You can already see people deserting to C# because it's got some feature or other that's missing from Java. It's not a significant number yet because of all the other strings attached, but it'll only grow if we let the language Nazis and purists bicker all day long about why we can't have enums or const. enums and const mean something new – something that can't easily be expressed in the Java platform now. Sure, there are workarounds – define typesafe enum classes or make getter interfaces – but these are large, ugly, clunky

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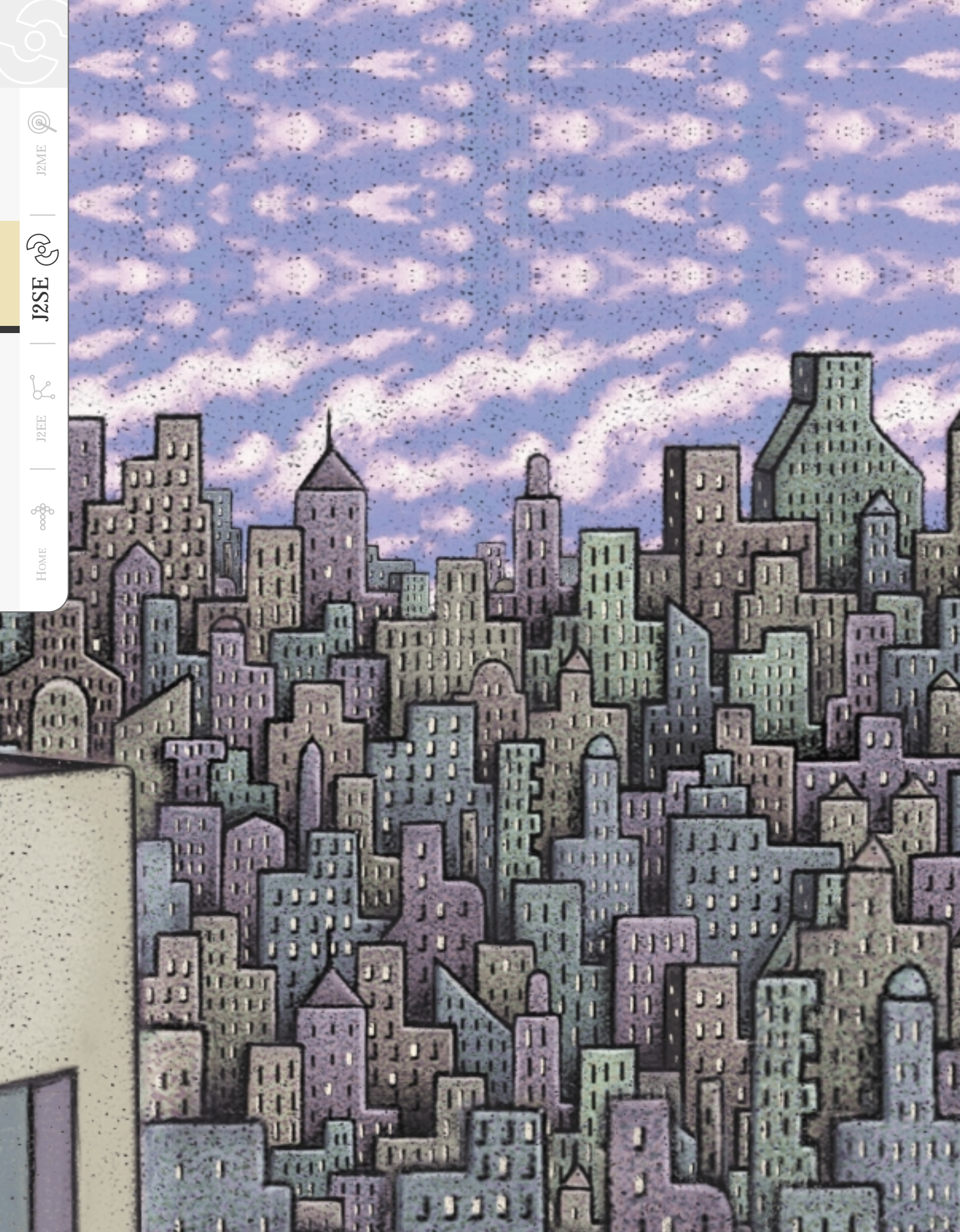
J2SE



J2EE



HOME



customizing ant

Y

developing a simple
custom task
by Kirk Pepperdine

ou have a task that your Ant build process needs to perform and none of the built-in or dozens of optional tasks fits the bill. If at this point you're thinking that Ant won't work for you, then the authors of Ant have some wonderful news. The framework they use to run built-in tasks is also available for your own task.

If that piques your interest, you'll be happy to know that in the next few paragraphs, I promise you'll have all the information you need to use this framework. If you haven't used Ant yet, read the excellent article by Joey Gibson, "A (Brief) Introduction to Ant" (*JDJ*, Vol. 7, issue 11), before venturing on this journey.

The framework that supports Ant loosely defines a contract that describes the responsibilities of the task provider. Briefly stated, the task provider provides a class that implements the desired behavior and introduces this task and its supporting class to Ant, exploiting one of the means available for that purpose. The framework is responsible for discovering the task's supporting class and then managing that class's life cycle. Although a task is fronted with a single class, other classes (which may or may not be known to Ant) may be used to help support the completion of the task. Let's take

an in-depth look at the custom task contract defined by Ant.

For a class to be considered a custom task it must implement the method, `public void execute()`. That's it! If you're wondering what the catch is, it's pretty much the same as with everything else. The more information you provide, the less work the framework has to do in order to work with your task. Providing additional information allows the framework to do more work for you. With this in mind, let's describe the portion of the contract we're concerned with here. The description of the providers' responsibilities are as follows:

- Named task must be supported with a Java class.
- The class must implement `public void execute()`.
- The class may extend `import org.apache.tools.ant.Task`.
- The class may implement `public void init()`.
- The class must implement a set method for each attribute of the task.
- The class should implement the default constructor.
- The name task must be registered with either the `taskdef` task or via the addition of an entry into the `task.properties` file.
- The `execute` method should throw a `org.apache.tools.ant.BuildException`.

Complementary to the providers' responsibilities are the frameworks' responsibilities:

- Call the default constructor for the provider's supporting class.
- Call the public void init() method once.
- Call the appropriate set method for every task attribute.
- Call the public void execute() throws BuildException method once for every occurrence of the corresponding task found in the build file.

In addition to those assuming these responsibilities, the provider must define a set of XML tags to be used when exploiting the custom task. From here, we could proceed to a fairly dry explanation of how all this fits together, but let's see how it all works in practice instead. I'll kick start the process with the following story.

Most applications built today contain a number of "off-the-shelf" components that complement code developed in-house. These components can be supplied by a combination of vendors and infrastructure teams that work alongside the application development team. Given that each group (especially third-party suppliers) will have its own delivery schedule over which you most likely won't have any influence, it would be unheard of not to have to deal with version management. Lack of a concise plan to manage versions often results in confusion among configuration management staff that can result in them having to spend a considerable amount of time sorting out which versions of which components (a.k.a. JARs) are to be used for each build. A tactical solution to this problem is to use a version map to describe the build. Let's first build a sample map and then a custom task to use this map to drive a build process.

To keep things somewhat simplified so we aren't too distracted from our main goal – learning how to build a custom task – we'll purposely limit the functionality of the version map to pulling artifacts from CVS. The test application will be a toy chat application that consists of four layers (see Figure 1).

The JMS bus was acquired from a third-party vendor (SwiftMQ in this instance). Our internal infrastructure group is responsible for the channel component. Finally, the application development team has built chat client and topic server. During the development process, they've also identified a common layer shared by the clients and the server. In accordance with our earlier constraints, the JMS implementation can be found in the file system. The JAR file for the channel, as well as the source for commons, the chat client, and the topic server will be pulled from CVS. Let's use XML to build the version map.

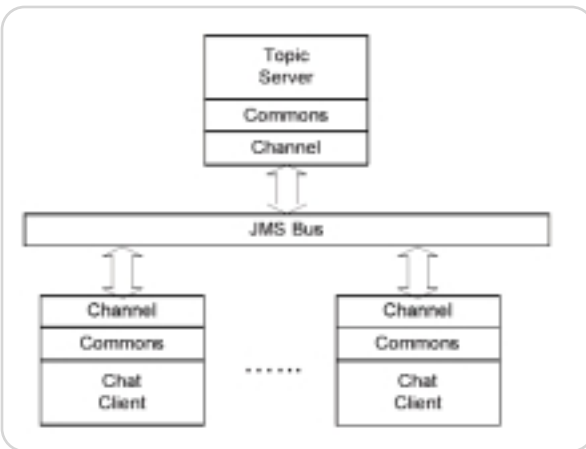


Figure 1 Chat component diagram

```
<map application="chat" version="1.0">
<component source="cvs" name="channel" version="cvs_label" dest="/lib"/>
<component source="cvs" name="common" version="cvs_label" dest="/common"/>
<component source="cvs" name="chat_server" version="cvs_label" dest="/server"/>
<component source="cvs" name="chat_client" version="" dest="/client"/>
</map>
```

The map contains all the information needed to identify all the attributes that are necessary to locate a component. *Note:* This mechanism does rely on a stable policy of how code artifacts are to be stored.

As mentioned earlier, we're required to register the custom task. This can be completed using one of two techniques. The taskdef task maps an alias for a task to its implementation. The second technique inserts the definition into the task.properties file found in the Ant distribution. A quick examination of the file will reveal how to do this. I'm going to avoid the discussion as to which approach is best, but there

Listing 1 Code template for a custom task

```
import org.apache.tools.ant.Task;
import org.apache.tools.ant.BuildException;

public class VersionMap extends Task {

    private String file;
    private String dest;

    public VersionMap() {
    }

    public void setFile(String file) {
        this.file = file;
    }

    public void setDest(String dest) {
        this.dest = dest;
    }

    public void execute() throws BuildException {
        try {
            execute0();
        } catch (BuildException be) {
            if (failOnError)
                throw be;
            else
                log(be.getMessage());
        }
    }
}
```

Listing 2 Triggering a get from CVS

```
public void execute0() throws BuildException {
    try {
        this.createSourceDir(this.dest);
        VersionMap map = VersionMap.createFrom(this.file);
        Iterator iter = map.iterator();
        while (iter.hasNext())
            ((VersionMapEntry)iter.next()).processMapEntry(this);
    } catch (Exception e) {
        throw new BuildException(e);
    }
}

private void executeTask(Task task) throws BuildException {
    task.setProject(this.getProject());
    task.setLocation(this.getLocation());
    task.setOwningTarget(this.getOwningTarget());
    task.init();
    task.execute();
}

public void getSourceFromCVS(String moduleName, String version, String dest)
throws BuildException {
    Cvs task = new Cvs();
    task.setCommand("checkout");
    task.setPackage(moduleName);
    task.setTag(version);
    task.setDest(dest);
    this.executeTask(task);
}
```



Kirk Pepperdine is the chief technical officer at Java Performance Tuning.com and has been focused on object technologies and performance tuning for the last 15 years. Kirk is a co-author of Ant Developer's Handbook (Sams).

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are implications from using either mechanism to register your custom task that go beyond technical issues. Let's look at the build file fragment found in the following code.

```
<taskdef name="versionmap" class="com.jpt.ant.task.VersionMap">
<target name="version">
  <versionmap file="chat.xml" dest="." />
</target>
```

This is telling Ant that we'd like to define the custom task aliased as versionmap and implemented in the class com.jpt.ant.task.VersionMap. The task versionmap takes two

attributes, the name of the file containing the map and a destination directory to work in.

Again referring back to the contract, we see that we should create a class that implements our custom behavior. Though it's not necessary, it makes life a lot easier to have our class extend org.apache.tools.ant.Task. Extending this class allows us to inherit common task behavior. We'll have to decide on an implement for the methods public void init() and public void execute(). In addition, the XML defines the two attributes, file and dest. Fields and supporting access methods must be implemented to support these attributes. Let's look at the custom task class template found in Listing 1.

With this, we've pretty much covered the entire contract.

All that's left is to fill in the task's behavior. Let's start with the init method. The init method gets called once and this occurs fairly early on in the build process. Consequently, we should embed behavior that we only want executed once and that can also occur early in the build process. Since our custom task doesn't have any behavior that fits this description, we allow the call to percolate up to the super classes implementation.

A common technique used for coding the execute method is to defer the bulk of the implementation to a helper method called execute0. Doing this allows us to easily handle the inherited attribute, failonerror, in the execute method. The main logic that we need is to read each entry in the version map and use the information to trigger a CVS get (see Listing 2). Note how the functionality of other tasks is being used to help us achieve our goal.

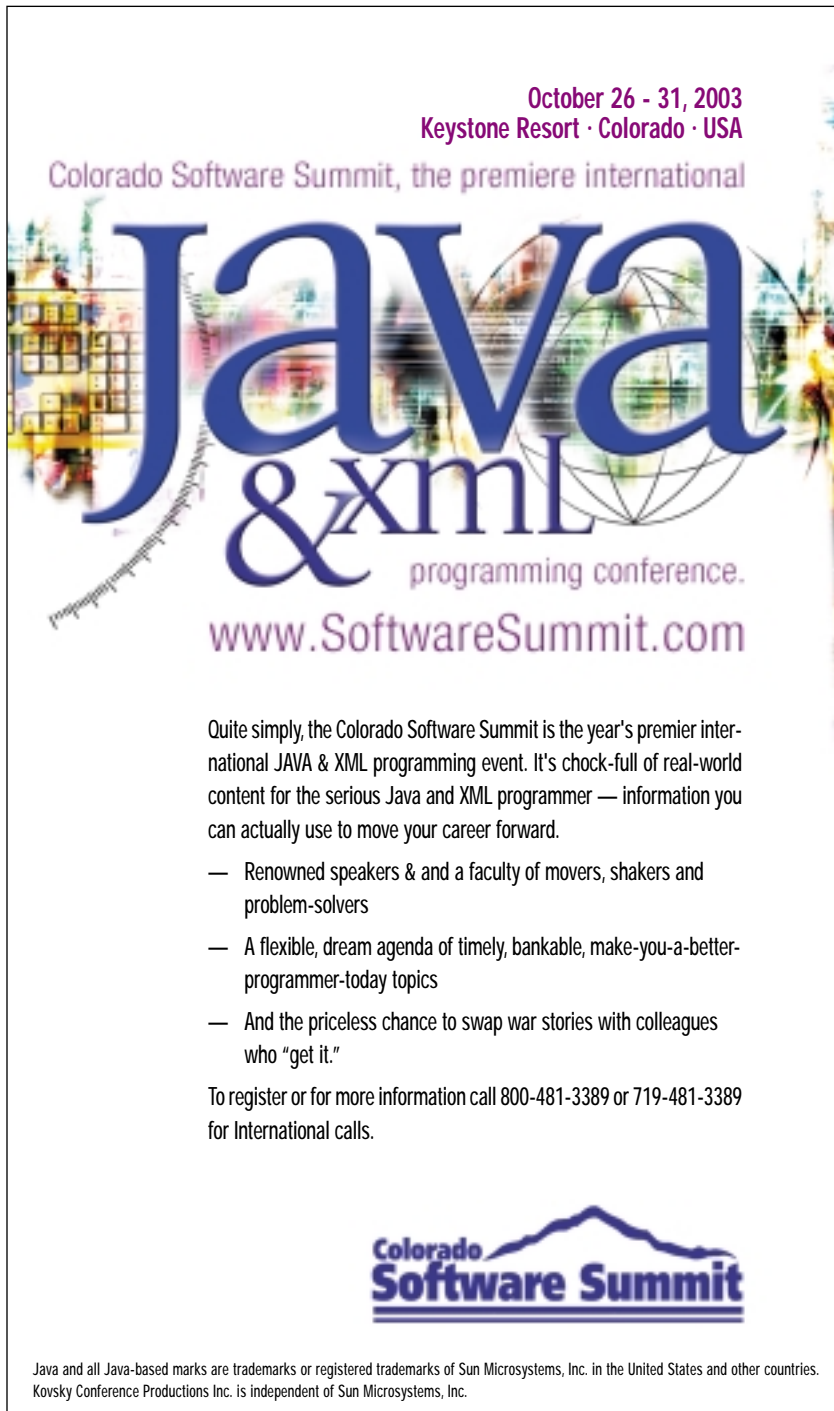
In the execute0() method, the XML file is converted into a map. An iterator runs through each entry in the map and calls its execute method using the task as a parameter. The execute method of the task is then free to make a call back on the getSourceFromCVS method. It's this method that creates an instance of a CVS (from the optional tasks list) task and then configures it. The executeTask method sets the technical parameters on the task before executing it. Our simplified custom task is now complete.

Where to Go from Here

Nested attributes can add a lot of flexibility to your custom task. Each Ant data type object is supported by a class and, consequently, the development path is fairly similar to one that's followed by custom tasks. In addition to tasks and data types, you can also build specialized build listeners. Though their development path is slightly different than that of data types and tasks, it's still not all that difficult. I've always found that it's best to look into Ant's code when I'm looking for examples or techniques to help me develop custom tasks, data types, and listeners. Happy Anting... ☺

References

- *Ant 1.5.1 source code:* www.apache.org
- Williamson, A., et al. (2003). *Ant Developer's Handbook*. Sams.



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Glen Cordrey
J2ME Editor

Guerrilla Campaign for Learning

Despite my years in the industry and ingrained cynicism, I'm still surprised at how many software development organizations do little or nothing to promote learning and best practices among their staff. In an industry that is subject to near-constant change, and where software quality is frequently bemoaned, it seems incredibly short-sighted when an organization doesn't have policies and procedures to help their software development staff enhance their skills, and learn and apply best practices. The most that many organizations do is send employees to occasional training, and even that is largely happenstance, based upon immediate circumstances or serendipity and not part of any plan.

If your organization seems clueless about the need for its software development staff to be in a continual learning cycle, or recognizes the need but has nothing in place to promote learning and best practices, consider starting a guerrilla campaign to effect change. Because many organizations are just now becoming involved in J2ME development, it can be a particularly propitious time to start such a grass roots effort. It can be a lot easier to instill good practices in a small group dealing with a new subject area than overcome the inertia of accumulated, disparate practices that may permeate an established, hidebound organization. As the small group grows, they can carry the culture of continuous learning and best practices along with them.

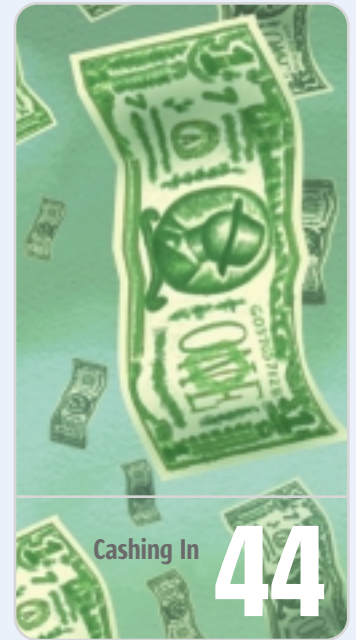
Two fronts to consider opening in your guerrilla campaign are developing your own internal Web pages and promoting brown bag meetings on topics of interest. Your Web pages can contain links to other relevant sites, specifications, newsgroups, and newsletters. Obviously, you want to link to sites such as Sun's J2ME pages, Microjava, and the developer sites of the various device OEMs and network providers. But don't rely on just these general links; supplement them with links to topics of particular interest. To avoid overloading developers, start with a

few essentials such as Sun's Wireless Blueprints and the MIDP 1.0 Style Guide, and periodically add to these links to expose developers to fresh content. Be selective – your goal is to identify core concepts and guidelines for good software development.

Another helpful section to have in your Web site is a set of links to pertinent books. If you're working in a technical area that you haven't worked in before, you can be productive faster and come to a better solution with the help of the right book. Books on more general topics, such as design patterns, can improve your overall understanding and the quality of your work. If a \$35 book saves a developer just one hour of time, it's paid for itself (which is why it puzzles me that so many software development organizations don't reimburse for book purchases).

For a second front in your guerrilla campaign, consider organizing brown bags on topics of interest. See if you can get the company to spring for pizza as an added inducement for developers to attend. Select topics people are interested in – your guerrilla campaign won't be very successful if you can't enlist many troops. Make the brown bags inclusive and participatory, not a bland "here's how it is" recitation of facts from "those in the know." Invite others to lead subsequent brown bags in areas that interest them. Your chances of making an impact increase with the number of people you engage in the process.

What's the best you can hope for? Well, the ultimate indicator of success may be that management comes to view your efforts the way Microsoft views companies that come up with neat ideas Microsoft didn't think of or failed at executing. So management decides to either do something similar and drive you out of business, or buy (or in this case, co-opt) you. Then you become the victim of your success, and have to decide whether you want to help institutionalize the process, get out of the way, or start another guerrilla campaign. ☛

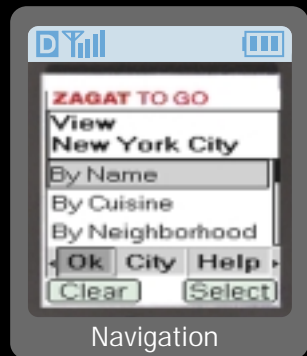


Guerrilla Campaign for Learning

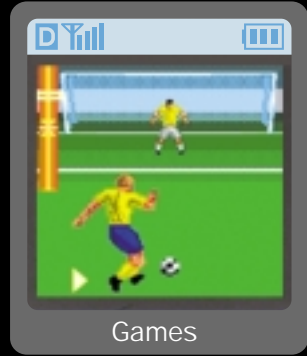
Despite my years in the industry and ingrained cynicism, I'm still surprised at how many software development organizations do little or nothing to promote learning and best practices among their staff. In an industry that's subject to near-constant change, and where software quality is frequently bemoaned, it seems incredibly short-sighted when an organization doesn't have policies and procedures to help their software development staff enhance their skills, and learn and apply best practices.

Glen Cordrey is a software architect working in the Washington, DC, area. He's been using Java for five years, developing both J2EE and J2ME applications for commercial customers.

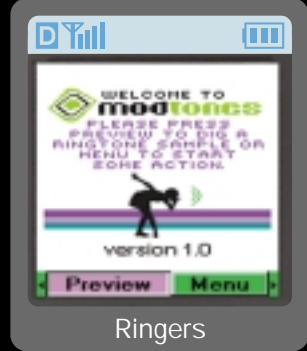
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CASHING IN

by Greg Schwartz

Distributing and marketing your J2ME killer app

You finally put the finishing touches on your new J2ME application and are probably starting to think about what is involved in marketing and distributing your killer app. It is at this point that, all too often, great ideas are left as nothing more than great ideas.

For many technical gurus, crossing the chasm from a finished application to an application that is distributed to people around the world involves the work of business professionals and marketing experts. For J2ME developers, however, getting this process underway is not only an attainable goal but also an exciting and rewarding journey that can begin immediately. From concept to consumer, this article will explain all that is involved in getting your application certified and distributed by the world's largest J2ME distributors.

I decided to focus on three popular distribution channels in this article: Nextel and Motorola's iDEN, Cingular Wireless, and Handango.com. I chose these channels because they are currently leading the marketplace in J2ME application distribution, and because each has a unique approach to working with developers. In addition, I recently went through the distribution process with each of these services and can therefore provide an accurate, informed portrayal of the steps involved. This article will begin with an overview of some general practices that are important when preparing your application for distribution. I'll then discuss, in detail, the procedure for partnering with the previously mentioned channels.

Preparing to Launch

Before you can begin working with the major carriers, you'll want to determine which distributors provide mobile devices that your J2ME application can run on. Although J2ME was designed to make use of the "write once, run anywhere" methodology, design decisions you have already made could influence whether or not your application can be distributed through certain carriers. Using device-specific APIs or custom canvases that will only appear correctly on a certain screen size or resolution could affect your marketing ability. The size of your application could also affect who will distribute your application. If your application was developed using standard J2ME and the included user interfaces, your application will likely be marketable to all of the major distribution streams with little or no changes needed.

If you determined that your application is not specific to a certain mobile device, you'll want to obtain emulators from as many different carriers as possible to test your program. Although Sun's Wireless Toolkit (WTK) provides a good starting point for testing, you will notice different display characteristics and performance issues when using manufacturer-specific emulators. A closer look at recommended testing for different distribution channels will be discussed in the following sections. In addition to developer testing, it's always a good idea to have family, friends, and business associates test your application. As the developer, it is often difficult to prepare for usage scenarios that occur when consumers use your product. You'll be surprised how much information can come from this type of testing.

What You'll Need

There are several items you'll want to have ready to go before you start contacting possible distributors. You'll find that these items are common requirements among most distribution channels and you'll save time and energy by preparing this information ahead of time.

Product Descriptions

The first and most important piece of information you'll want to prepare is a "long description" of your product. This description can often be used to market your application to different distribution channels and to provide the product information to consumers. Your description should tell consumers how they can benefit from your product and also provide an overview of the application's functionality. It's also good practice to include a link to your company's Web site or product site where a consumer can find more detailed information.

In addition to this "long description," you'll want to create a 2-3 line "short description" that's both catchy and informative. This is the description that will appear next to the link for your product in the distributor's application catalog.

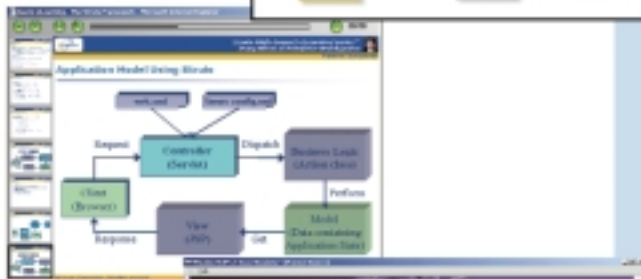
Product Pictures

When consumers visit your product's page in a content catalog, they'll first see an application screenshot or other product image representing your J2ME application. Nextel/Motorola iDEN require a single screenshot while Cingular Wireless and Handango.com allow multiple images



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or an animated gif image that could portray several different screenshots or usage scenarios.

User Manual

A product user manual, illustrated in Figure 1, is only required by a few distribution channels, but you'll find that posting a user manual on your Web site can be a helpful resource for consumers. Most MIDlets are very simple and should be self-explana-

Web site. All of the distribution channels will allow you to link to your company or product Web site from the product page that consumers view before purchasing your application. A company or product Web site (see Figure 2) is a good tool for explaining your content in more detail and showing additional product images. It's important to clarify which phones and service providers your product is compatible with. It is also a good idea to provide direct links to the distributor's Web site where your product can be downloaded or purchased.

“Each major wireless carrier will put your application through a series of testing scenarios before approving it for consumer sales”

tory; however, since a user manual is a requirement for some carriers, such as Nextel and Motorola, and can provide a thorough explanation of your product to consumers, you'll want to prepare this before distributing.

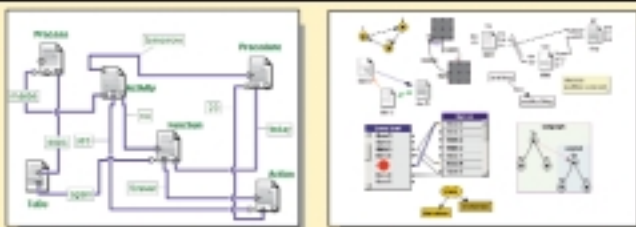
A good user manual should provide a sufficient number of screenshots that illustrate the directions. The program space (how much program space the application will need after installation) and data space (space used by resource files or persistent storage entered by the user) requirements for the handset should also be included.

Web Site

Though this is not a requirement for distribution, the previously mentioned materials alone could be sufficient for a

Distributing Through Nextel/Motorola iDEN Update

If you wanted to get your application downloaded by as many consumers as possible and could focus on only one distribution stream, Nextel and Motorola's iDEN Update would be the one to target. Nextel and Motorola pioneered J2ME distribution with their iDEN Update program and continue to attract a large number of consumers to their product catalog. The process of getting your application certified and distributed through iDEN (see Figure 3) is the most rigorous and time-consuming of those that I've seen to date. If you're able to get your product into the iDEN catalog, however, this process will have been well worth your while as this distribution stream will likely account for a large part of your product's purchase activity.



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Testing

For distribution through Nextel and Motorola's iDEN Update, you should use the "Motorola iDEN SDK for J2ME Technology," which is available at http://idenphones.motorola.com/iden/developer/developer_home.jsp. This SDK provides emulation, project management, and JAR/JAD packaging for the iDEN J2ME products. This tool is free after registering as a developer with iDEN Update and contains the iDEN J2ME extensions and emulator skins for the i85c, i90c, i95cl, and i88s (a GPS) phones.

It's also possible to test your application on an actual Motorola iDEN phone using a USB or serial data cable that can be purchased from any Nextel store or from Nextel's Web site, and an application loader provided through Nextel's developer portal. If your application does not make use of any network services, you'll want to use the JALite application to transfer your MIDlet from your computer to your handset. For applications that are network-aware, you must first obtain permission from Motorola by describing the application you'll be testing. Motorola will then provide a login and password to use with their WebJAL application. This application allows developers to load an unlimited number of programs that make network connections to a maximum of five iDEN handsets.

Each major wireless carrier will put your application through a series of testing scenarios before approving it for consumer sales. For inclusion in the iDEN Update catalog, a list of user interface compliance and consistency requirements can be found in the "Nextel/Motorola Wireless Certification Program" document that's available through Nextel's developer portal. These requirements focus on user interface consistency, product functionality, usability, and the required user manual. In addition, applications will



Figure 1 Product user manual

undergo stress tests that focus on memory constraints and inappropriate behavior scenarios.

Working with a Publisher

A relatively new but widely growing component of the J2ME marketing and distribution process is the application publisher. Publishers have a unique relationship with the developer and the distribution channel that often varies between different carriers. The publisher acts as the developer's agent or liaison throughout the certification process and continues in this role after the application goes live to consumers. In the case of Nextel and Motorola's iDEN catalog,



Figure 2 Company/product Web site

the publisher has several important responsibilities, including providing legal agreements and distribution contracts, testing and certifying an application, handling all communication between the developer and wireless carrier, providing sales reports and product statistics, and delivering royalty payments to the developer.

You'll find that there are both advantages and drawbacks when working with a publisher. Working with a publisher often provides a better channel for communication in which you can receive quick responses to basic questions. Although publishers often provide a range of services to a large number of customers, they can dedicate more time to your needs than a major carrier could. Unfortunately, working with a publisher can also result in increased delays since all requests targeted at the distribution channel must go through your publisher.

Nextel and Motorola currently allow developers to choose between three publishers when developing J2ME content for their iDEN catalog. The publishers - MicroJava, TiraWireless, and PopSoft - all accept open submissions and are well

looking to distribute. The trademark search simply verifies that you are not violating any existing trademarks with your product name.

If the application idea and name are approved, you'll be asked to fill out a product submission form. This form will ask for detailed company and product information including file sizes, model compatibility, pricing, and descriptions to be used on the iDEN site. Much of the information from this form will be transferred directly to the iDEN Web site so you'll want to review it before submitting. This form is then sent to the publisher along with the application JAR/JAD files and user manual.

In addition to the product submission form, a traffic flow template is required when certifying any application that involves sending data over the carrier's network. This template must include a diagram illustrating the flow of data over the network and the size of the data being transferred. It must also include a brief paragraph describing the application's networked components and functionality. Nextel requires this information so they can determine the cost of using the application and the amount of time this functionality will take on the handset and on the network.

At this point your publisher will begin testing your application to determine if its functionality and usability are in conjunction with iDEN style guidelines. This process usually takes anywhere from 1-4 weeks. It's important to note that publishers can only submit tested applications to iDEN on the first of each month. If an app finishes testing on the second day of the month, it won't be delivered to Nextel and Motorola until the first of the next month.

While the application is going through its testing phase, the developer will receive a Software Distribution Agreement (SDA) detailing the terms of the distribution contract with your publisher. The SDA includes the obligation and rights of the developer and the publisher, royalty payment information, and other legal guidelines.

Once the SDA is agreed upon and your publisher finishes testing, the application is sent to Motorola for a final review. When this is completed, you'll receive a detailed "Applications Validation and Verification Performance Test Plan and Results Document" from Nextel. This document

"With a market size of nearly \$6 billion in 2002 and over \$18 billion by 2006,

versed in the procedural, technical, and legal requirements involved in distributing applications through iDEN. You'll want to contact each publisher with regards to their publishing services before choosing one. It's important to determine the time it takes for testing and the royalty percentage you'll receive as this varies for different publishers.

The Certification Process

The following events provide a detailed overview of the certification process that occurred with one of the above publishers. Depending on the publisher you work with, you may experience slight variations in the process.

Once you have selected a publisher, your first step is to send them a detailed product description, screenshots, and/or a user manual. The publisher will conduct a trademark search on the name and then determine if your application is in line with the content Nextel and Motorola are

includes a thorough analysis of the tests conducted during the certification process. After this review, which usually takes 2-4 weeks, your publisher will notify you that your application has "gone live" and is available to consumers.

Going Live to Consumers

If your application has made it this far, you can finally sit back and relax. As outlined in the SDA, however, you are still responsible for providing technical support and bug fixes for your application. The current iDEN system does not give developers access to their product's purchase statistics. This aspect of the iDEN system is currently being upgraded to support such functionality, but in the meantime you'll need to contact your publisher for this information. You can expect to receive royalty payments every three months. Some publishers, however, will not send your first payment until the application has been live for four months. Royalty pay-



ments vary from publisher to publisher but generally developers receive 50–70% of each purchase. For many distributors this percentage is calculated after a small payment processing fee is deducted.

Distributing Through Cingular Wireless

Cingular Wireless is another major carrier that provides J2ME content to its customers. Currently, Cellmania, Inc., distributes much of the Cingular Wireless J2ME software. Cellmania powers the Cingular Wireless Software Store that allows Cingular customers to purchase wireless applications through a mobile or desktop portal. Many consumers find content that they want for their phone, from their phone. Cellmania makes this possible and a large portion of their sales originate from handsets. The distribution system provided by Cellmania is very developer friendly and the Cellmania team maintains exceptional relations with those distributing content through their portal.

Testing

For deployment on Cingular Wireless phones, you'll want to use a combination of Motorola, Nokia, and Ericsson SDKs. A full line of Nokia SDKs can be downloaded from <http://alliance.cingularinteractive.com/dev/cda/home> and the SDK for non-iDEN Motorola phones is available at www.motocoder.com. For testing with Ericsson phones, download the "Sony Ericsson J2ME SDK" from www.ericsson.com/mobilityworld/sub/open/index.html.

Working with Cellmania

Cellmania provides a complete solution for mobile operators to provision and sell J2ME applications through its J2ME mFinder portal. This portal is currently one of the main dis-

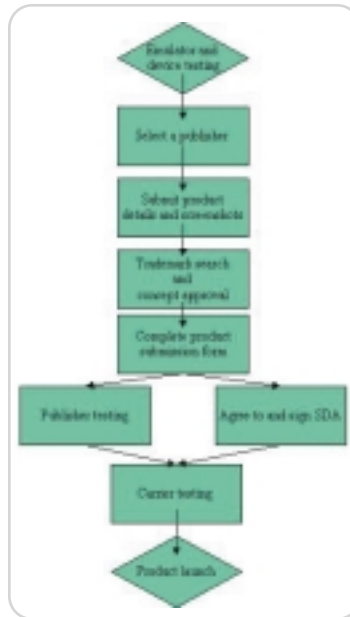


Figure 3 Certification and distribution process

robustness of content.

As the developer you are responsible for hosting any images that occur on your Cingular/Cellmania product page. You'll need to send the HTML code with image links to a representative at Cellmania if you would like to include such content.

After submitting your application, Cellmania editors will test the application based on the above criteria. This testing phase usually is completed within a couple of weeks and consists of an automated verifier for Java and a multipoint manual certification. Upon successful completion of this testing phase, the application will become part of the mFinder directory.

Going Live to Consumers

Cellmania's mFinder directory is available through several different carriers throughout the world. Once in the mFinder directory, information about your application can be viewed from any of these sources; however, J2ME content can only be purchased through the Cingular portal at this time.

As the developer, you can view the number of purchases, purchase dates, and royalty details through the Cellmania Developer Portal. Royalty payments for the developer are remitted within 30 days after Cellmania receives the fees for a purchase.

Any modifications to your product page in the mFinder directory or to your application can be made by contacting a member of the Cellmania staff. Content updates usually occur within a week and you can ask to be notified once your update has been processed.

Distributing Through Handango.com

Handango is not a major wireless carrier or a global phone manufacturer, yet they currently have the largest catalog of J2ME content and are well worth mentioning as a powerful distribution channel. J2ME software in Handango's

an expected growth to the demand for cellphone content is beginning to soar”

tribution channels used by Cingular Wireless for J2ME applications. Because of this partnership, developers deal directly with Cellmania when certifying an application for Cingular Wireless.

The Cellmania Developer portal is where your certification process begins. Developers must first register with Cellmania by filling out an online form that includes basic contact information.

After registering with Cellmania, a developer must log in to his or her account and fill out the application information form. This online form includes the application description, location of JAR and JAD files, and pricing information. Cellmania's SDA can be accessed via a link from this form titled "Terms of Service." This agreement outlines many important details, including revenue-sharing information and minimum application criteria. Some of the criteria are originality of content, usability, functionality, usefulness, and

main product catalog can be distributed to AT&T Wireless, Cingular, and T-Mobile customers. Handango also offers "value-added" channels, such as Nokia's Software Market and the SprintPCS Software Store, that select applications can be featured in.

The process for including applications in Handango's catalog is a lot different than the previous two distribution streams discussed. Unlike most other distribution channels, Handango does not certify content before it's included in their main product catalog. Any individual or company with a J2ME application can make their product available through Handango.com in a matter of hours. The developer handles the majority of the setup process that occurs prior to distribution. This includes testing the application, loading the JAR/JAD files onto the server, and preparing the product page that appears in Handango's catalog. All customer and payment-related issues, however, are handled by Handango.



Launching Your Application



Greg Schwartz is the founder and CEO of Mobatech LLC. He developed the Mobile Checkbook and Mobile Checkbook Pro personal banking applications. The Mobile Checkbook J2ME software is currently distributed by major carriers including Nextel and Cingular Wireless. Greg holds a BSE in computer science from the University of Michigan's College of Engineering.

greg@
mobatech.com

To begin distributing your J2ME application, you must first register with the Handango Software Partner Program by filling out a brief online form. After logging in as a developer, review Handango's SDA for details pertaining to payment information and distribution terms. If you agree to this SDA, you can immediately begin loading your product into the Handango catalog by selecting the "Add a Product" link from the developer portal.

At this point you'll be walked through a series of online forms that focus on your product description, software category selection, compatible devices, file information, and product images. You'll also have the opportunity to include a trial version of your application. Handango offers several product registration models for use with J2ME software.

After completing the required product submission forms and uploading your application's JAR and JAD files, your application will appear almost immediately in the Handango catalog.

Once your application has gone live to consumers, developers can modify their product information or application files at anytime. You can also set up your Handango account to e-mail you each time a customer purchases your product and access detailed purchase statistics via Handango's developer portal. Handango is one of the few distribution streams that provides the developer with the customer's name, location, and contact information after he or she purchases an application. Royalty payments are sent out within 30 days after the close of any month in which Handango receives full payment from a customer. It's important to note that the number of downloads and number of purchases for your product often vary as consumers can download an application multiple times if they experience technical difficulty during the installation process.

Conclusion

The distribution streams discussed in this article are just a few of the many channels available to J2ME developers. In addition to targeting these distributors, developers should look into other marketing strategies that are outside the scope of this article but could assist in driving customers to the channels where your products are available.

With a market size of nearly \$6 billion in 2002 and an expected growth to over \$18 billion by 2006, the demand for cellphone content is beginning to soar. The development and distribution of J2ME software involves a new and exciting field of technology with tremendous growth potential and the opportunity for revolutionary software ideas to emerge. Whether you're a professional software developer or just interested in J2ME as a hobby, you have the ability to become a part of this revolution as you take your idea from concept to consumer and enjoy the many benefits of having a product available to consumers around the world. ☺

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- *Cingular Wireless Software Store*: <http://cingular.cellmania.com/web/home.jsp>
- *Cellmania, Inc.*: www.cellmania.com
- *Cellmania Developer portal*: <http://cingulardeveloper.cellmania.com/html/devlogin.jsp>
- *Handango Software Downloads*: www.handango.com

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Industry News

Pramati Releases Pramati Server 3.5

(Hyderabad, India) – Pramati Technologies has announced the general availability of Pramati Server 3.5, an enhanced release of its application server. This new release will deliver higher performance and superior manageability for production applications. Pramati Server, which became the first application server to reach compliance to the J2EE 1.3 standard, continues its adherence to open standards. Pramati Server 3.5 is available for download by evaluators and is free for development use.

www.pramati.com

RealNetworks Embraces Java with Sprint PCS Content Deal

Streaming-video company RealNetworks Inc. has announced a deal with Sprint PCS to offer an Internet-style media player to Sprint's Vision customers – an offering that marks a significant change in RealNetworks' wireless strategy.

RealNetworks will offer its content, which includes feeds from CNN, NPR, and others, through a Java application instead of through its RealOne player for wireless devices. RealNetworks also will host the service. The move is both a nod to the growing dominance of Java technology and its associated distribution channel and to the difficulty of selling a proprietary player to handset manufacturers.

www.realnetworks.com

Instantiations Ships New Release of CodePro Studio

(Portland, OR) – Instantiations, a provider of advanced Java development solutions, has begun shipping CodePro Studio 2.3, a comprehensive suite of products that enhances IBM WebSphere Studio and Eclipse development environments. The updated CodePro family includes CodePro Advisor, best practices tools; CodePro Agility, productivity tools; CodePro Build, build management tools; and CodePro Studio, the complete suite.

CodePro Studio 2.3 includes significant new features that are designed to maximize productivity, increase code

quality, and reduce development costs. www.instantiations.com

Apache Targets Java Web App Server

Apache.org, the group behind the popular Apache open source Web server, has announced plans to create a Java application server compliant with Sun's J2EE technology.

The project, for the moment going by the name "Apache Geronimo," has

as its goal the development of open source, Apache-licensed application server software that would compete with proprietary J2EE-based servers from companies such as IBM and BEA. www.apache.org

Sun/AMD to Provide Support for Java on Opteron Processor for Linux and Windows

(San Francisco) – Sun Microsystems, Inc., has teamed with AMD to provide native Java technology support for the 64-bit AMD Opteron processor. By supporting the 64-bit Linux and Windows platforms on the AMD Opteron processor, Sun is allowing companies to migrate their current Java applications from a 32-bit to 64-bit computing platform with little or no changes to the code, as well as enabling the development and deployment of new Java applications and Web services. Sun expects to make the 64-bit Linux and Windows ports to AMD Opteron available with the release of the Java 2 Platform, Standard Edition (J2SE) v1.5 in the summer of 2004. Blackdown, a J2SE licensee, also contributed technology to the development of these ports.

www.sun.com

LinuxWorld Magazine Launched at LinuxWorld Conference & Expo

(Montvale, NJ) – SYS-CON Media's (www.sys-con.com) highly anticipated new title, *LinuxWorld Magazine*, is now available on newsstands around the world, and in specialty bookstores such as Borders and Barnes & Noble. *LinuxWorld Magazine* is the leading resource for the growing number of Linux professionals and corporate IT-technology managers who are seriously evaluating and deploying Linux-based systems.

The premier issue of *LinuxWorld Magazine* is expected to sell more than 40,000 single copies worldwide. In addition, the magazine will be distributed to subscribers and will have a large number of bonus distributions at shows.

LinuxWorld Magazine's premier issue contains the Linux Resource DVD, a \$198 value, offered free with the magazine on newsstands and to paid subscribers.

"*LinuxWorld Magazine's* premier issue is a collectors' classic," said Kevin Bedell, editor-in-chief of the new publication. "It features a wealth of knowledge for corporate IT managers, including the Linux Resource DVD."

www.linuxworld.com



Are you Using Abstract Classes, Polymorphism, and Interfaces?

...to improve the design of your projects



Yakov Fain

If the answer is no, at a minimum your project needs a code review.

Let's work on the following assignment: a company has employees and consultants. Design classes with and without the use of inheritance to represent the people who work for this company. The classes should have the following methods:

- `changeAddress`
- `promote`
- `giveDayOff`
- `raiseSalary`

Promotion means giving one day off and raising the salary by a specified percentage. For employees, the method `raiseSalary` should raise the yearly salary and, for consultants, it should increase their hourly rate.

Abstract Classes

A class is called abstract if it has at least one abstract (not implemented) method. The keyword `abstract` has to be placed in the definition of the method(s) and the class itself. For example, the class in Listing 1 has three concrete methods and one abstract. (Listings 1–11 can be downloaded from www.sys-con.com/java/sourcecode.cfm.)

Abstract classes cannot be instantiated, but they allow you to create superclasses that implement some of the functionality, while leaving one or more methods to be implemented in subclasses.

The class `Person` can contain dozens of concrete methods that are the same for every person, such as `changeAddress` and `giveDayOff`, but since the process of raising a salary is different for employees and consultants, the method `raiseSalary` should remain abstract. Please note that even though this method is abstract, it could be called in an abstract class because by the time the concrete class is instantiated, the method will be already implemented. Since we have two types of workers, let's create subclasses `Employee` and `Consultant` and imple-

ment the method `raiseSalary` based on different rules (see Listings 2 and 3).

The designer of the class `Person` may not know the specifics of the raising salary process, but this does not stop him or her from calling the method `raiseSalary`. Programmers writing subclasses are forced to write an implementation of this method according to its signature declared in the abstract class. If they declare a method `raiseSalary` with a different argument list, this will be considered method overloading and the subclass will remain abstract. The class `Promoter` in Listing 4 shows how to use the classes `Employee` and `Consultant` for promoting workers.

Polymorphism

A programming language could be considered object-oriented if it supports inheritance, encapsulation, and polymorphism. The first two notions can be easily defined:

- **Inheritance** lets you design a class by deriving it from an existing one. This feature allows you to reuse existing code without doing copy and paste. Java provides the keyword `extends` for declaring inheritance.
- **Encapsulation** is the ability to hide and protect data. Java has access-level qualifiers such as `public`, `private`, and `protected` to control who can access class variables and methods. There is also so-called package-level protection, which is automatically engaged if you don't use any of the access-level keywords.
- **Polymorphism**, though, is easier to understand through an example. Let's look at the classes `Person`, `Employee`, and `Consultant` from a different angle. We'll populate a `Vector`, mixing up the instances of classes `Employee` and `Consultant` – in real life this information usually comes from a database. For example, a program could get the person's work status from the database and instantiate an appropriate concrete class. The class `Promoter` (see Listing 4) will give an additional vacation

day and increase the salary or hourly rate of every worker by 5%.

Please note that even though we cast every object from the collection workers to the ancestor's type `Person` in line 17, Listing 4, the variable `pers` can hold references to its descendent objects. The actual object type will be evaluated during runtime only. This feature of object-oriented languages is called runtime or late binding.

The output of the class `Promoter` will look as follows:

```
Class Person: Promoting a worker...
Class Person: Adding a day off
Class Employee: Increasing salary by 5%
Class Person: Promoting a worker...
Class Person: Adding a day off
Class Consultant: Increasing hourly rate by 5%
Class Person: Promoting a worker...
Class Person: Adding a day off
Class Employee: Increasing salary by 5%
Class Person: Promoting a worker...
Class Person: Adding a day off
Class Employee: Increasing salary by 5%
```

Both classes `Employee` and `Consultant` are inherited from the same base class `Person`. Instead of having different methods for increasing the worker's compensation based on its type, we give a polymorphic behavior to the method `raiseSalary`, which applies different business logic depending on the type of object from the collection. Even though it looks as if we're calling the same method `promote`, this is not the case. Since the actual object type is evaluated during runtime, the salary is raised properly according to this particular object's implementation of the method `raiseSalary`. This is polymorphism in action.

The while loop in the class `Promoter` will remain the same even if we add some other types of workers inherited from the class `Person`. For example, to add a new category of worker – a foreign contractor – we'll have to create a class `ForeignContractor` derived from the class

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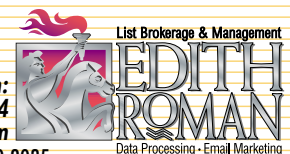
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Person and implement the method `raiseSalary` there. The class `Promoter` will keep casting all these objects to the type `Person` during runtime and call the method `raiseSalary` of the proper object.

Polymorphism allows you to avoid using `switch` or `if` statements with the expensive operator `instanceof`. Listing 5 shows an ugly alternative to our while loop from the class `Promoter` that assumes there is no abstract method `raiseSalary`, but we have separate promote methods in each subclass of the `Person`. This code would work slower than the polymorphic version from the class `Promoter`, and the `if` statement would have to be modified every time a new type of worker is added.

Interfaces

A similar functionality could be implemented using Java interfaces. We'll keep working with a modified version of the ancestor class `Person` because it has such useful methods as `changeAddress` and `giveDayOff`. But this class doesn't have to be abstract anymore because the method `raiseSalary` will be moved to a Java interface. The method `promote` won't be needed; we'd rather make the method `giveDayOff` available to descendants of the class `Person` by changing the private access level to protected (see line 8 in Listing 6).

Here's the "interface way" to ensure that each person in the firm receives the proper salary raise despite the differences in payroll calculation.

Let's define an interface `Payable` in Listing 7. More than one class can implement this interface (see Listing 8). When the class `Consultant` declares that it implements interface `Payable`, it promises to write implementations for all methods declared in this interface – in our case it's just one method `raiseSalary`. Why is it so important that the class will "keep the promise" and implement all the interface's methods? In many cases interface is a description of some behavior. In our case behavior `Payable` means the existence of the method `boolean raiseSalary(int percent)`. If any other class knows that `Employee` implements `Payable`, it can safely call any method declared in the `Payable` interface (see the interface example in Listing 9).

Let's forget for a moment about employees and consultants and switch to the Java AWT listeners and events. When a class declares that it implements the interface `java.awt.ActionListener`, a JVM will call the method `actionPerformed` on this class whenever

the user clicks on the window's button, and in some other cases as well. Try to imagine what would happen if you forgot to include the method `actionPerformed` in your class. The good news is that your class won't even compile if not all methods declared in the interface were implemented. The `java.awt.WindowListener` interface declares seven methods, and even if you are interested only in the `windowClosing` one, you must include six additional empty-bodied methods to compile the class (window adapters simplify this process, but they are beyond the scope of this article).

While both abstract classes and interfaces can ensure that a concrete class will have all required methods, abstract classes can also contain implemented methods, but interfaces can't.

Beside method declarations, interfaces can contain final static variables. For example, let's say we have multiple bonus-level codes used in several classes during the calculation of new salaries. Instead of redefining these constants in every class that needs them, we can create the interface shown in Listing 10.

Now a small change in the class declaration will allow us to use these bonus levels as if they were declared in the class `Employee`:

```
public class Employee
    implements Payable, Bonus {
    ...
    if (empLevel==JUNIOR_LVL){
        //apply the rules for juniors
    }
}
```

```
public class Consultant
    implements Payable, Bonus {
    ...
}
```

Java does not allow multiple inheritance, which means a class can't have two independent ancestors, but you can use interfaces as a workaround. As you've seen in the example above, a class can implement multiple interfaces; it just needs to implement all methods declared in all interfaces. If your window needs to process button clicks and window closing events, you can declare a class as follows:

```
class MyWindow implements ActionListener,
    WindowListener{...}
```

During evolution, an `Employee` can obtain multiple behaviors, for example

```
class Employee extends Person
    implements Payable, Transferable,
        Sueable, Bonus {...}
```

Consultants such as myself are usually more primitive creatures and can be defined as follows:

```
class Consultant extends Person
    implements Payable, Sueable {...}
```

But if a program such as `Promoter` is interested only in `Payable` functions, it can cast the object only to those interfaces it intends to use, for example:

```
Employee emp = new Employee();
Consultant con = new Consultant();
Payable person1 = (Payable) emp;
Payable person2 = (Payable) con;
```

Now we're ready to write a second version of the class `Promoter` that will use the classes `Employee` and `Consultant` defined in Listings 8 and 11.

The output of this program will look similar to the output of the class `Promoter` from Listing 4:

```
Class Employee:Increasing salary by 5%
Class Consultant:Increasing hourly rate by 5%
Class Employee:Increasing salary by 5%
Class Employee:Increasing salary by 5%
```

Line 18 of Listing 9 may look a little confusing: How can we call a concrete method `raiseSalary` on a variable of an interface type? Actually we call a method on a concrete instance of the `Employee` or a `Consultant`, but by casting this instance to the type `Payable` we are just letting the JVM know that we're only interested in the methods that were declared in this particular interface.

Java Technical Interviews

During the technical interviews, probably the most frequently asked question is, "What's the difference between Java abstract classes and interfaces?" While interviewing Java programmers, I also found out that only half of the job applicants could properly complete the assignment described at the beginning of this article.

During the job interview your answers should be clear and short; you won't even have a chance to use all the material presented here. Here's one version of the answer to our problem.

If two classes have lots of common functionality, but some methods should be implemented differently, you could cre-

—continued on page 58

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Aligo Omni Mobile Platform

by Aligo, Inc.

Reviewed by
Jim Milbery

Way back in the November 2001 issue of *JDJ* (Vol. 6, issue 11), I took a look at Aligo's M-1 Mobile Application Server. Back then, the technology market was still in the heady "bubble" days and wireless was the next big frontier. Fast-forward to mid-2003 and here we are wallowing in the throes of an extended technology slump. However, wireless applications are still a part of the next big frontier, and the team at Aligo has been hard at work updating their software. I recently had the chance to get my hands dirty with the latest, forthcoming release of the Aligo Omni Mobile Platform.

Aligo's Vision for Mobile Enterprise Computing

Aligo's core value proposition has not changed – mobile applications must be tightly integrated with the organization's preexisting enterprise infrastructure. Aligo's product has evolved into a full-blown platform, with support for thousands of differ-

ent devices on worldwide networks. With its latest release of the software, the team at Aligo has included powerful synchronization capabilities in the Omni Mobile Platform, allowing both connected and disconnected access to enterprise applications. The Aligo software platform is a J2EE application that takes advantage of J2ME, Personal Profile, and pJava. For example, now you can build a PDA-based time card application for your mobile field force that can be disconnected from the network. Users can enter transactions into their handheld device and later synchronize the results back into their ERP, CRM, or SCM application. The Aligo team has also created some prebuilt applications for Groupware, Sales Force Automation, and Field Services.

In its next version of Omni Mobile Platform, Aligo will include native support for Microsoft devices by rendering client applications into C#, so users will be able to build once and deploy across

Aligo, Inc.

444 De Haro Street, Suite 211
San Francisco, CA 94107

Phone: 415 593-8200

Fax: 415 553-8896

E-mail: info@aligo.com

Web: www.aligo.com

Specifications

Platforms: Windows NT/2000, Linux, various Unix

Pricing: Contact Aligo for pricing

Test Environment

Toshiba Satellite Pro 4600 1 CPU (847MHz),
Windows 2000 Professional SP2 256MB RAM

every type of mobile device. This will be the first time that applications running within the compact .NET framework will be able to directly access Java back-end processes.

Addressing Wireless Technical Challenges

Adding a wireless layer to your enterprise applications still presents some unique challenges:

- Mobile devices depend on different markup languages and/or protocols and have a wide array of operating capabilities (screen size, memory, etc.).
- The wireless network may require intermittent connectivity and often has a higher latency and lower bandwidth.
- Wireless applications offer new messaging channels (such as SMS).
- Transaction integrity into back-end enterprise databases and applications can be more complex (due to broken connections from the wireless device).
- Certain applications may work better utilizing a "synchronization" model, rather than requiring a continuous connection to the back-end server.

In the new incarnation as a software platform, the Aligo team has added some powerful enhancements. The platform includes a synchronization engine that allows for offline access to data. Disconnected applications operate primarily on your mobile device, and these applications can function without an active connection to your back-end server or enterprise application. Any device that supports either

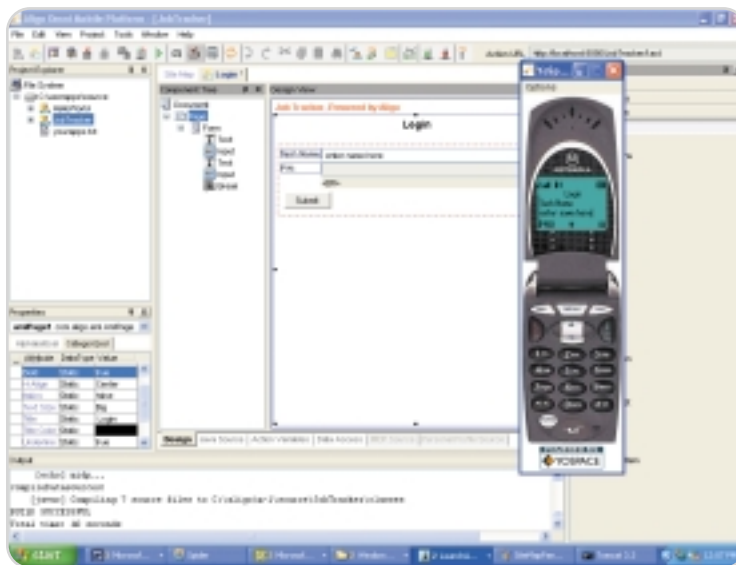


Figure 1 Job Tracker application demo

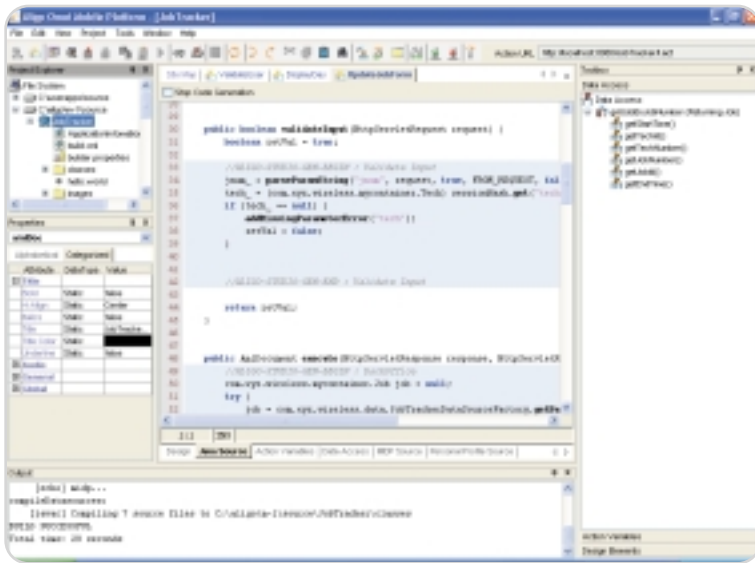


Figure 2 Java source in the Aligo Omni Mobile Studio

J2ME or a pJava JVM can be used with Aligo. Aligo's Profile Manager allows developers to provide customized profiles for each and every mobile device (phones, Palm Pilots, Pocket PCs, etc.). If you choose to deploy "connected" applications, the Session Manager will handle transaction integrity for you. Should you lose a connection, your mobile device can seamlessly reconnect to applications without data loss. You can connect to your enterprise databases through your application

Building Mobile Applications with the Aligo Omni Mobile Studio

As always, Aligo makes the latest version of their software available for evaluation. The installation kit is packaged as an InstallAnywhere application. The Omni Mobile Platform is built using 100% Java, so it can be deployed with your favorite application server. The installation kit includes an extensive developer reference guide, but I suggest you start out with the "Getting Started with Mobile Applications" guide and the new "Job Tracker" application. Mobile applications require some different design disciplines and the sample application will help you get a feel for these differences, especially the design of "synchronized" applications. The starting point for testing the Job Tracker application is the Omni Mobile Studio, shown in Figure 1.

The Studio provides you with a stand-alone development environment that simplifies the development of mobile applications. The server-side components are deployed as a WAR file, and the client is deployed as a MIDlet. I continue to be impressed with the ease at which you can switch between devices, and the new version makes it just as easy to switch between connected and disconnected operations. Aligo employs a drag-and-drop type interface for laying out the mobile application (as shown in Figure 1). The graphical buttons at the top and side of the panel control the various functions of your application (and the Omni Mobile

Studio environment). The graphics match the functions pretty well, so you'll come up to speed with the Studio interface fairly quickly. The core metaphor for building applications is constructed around "actions." Actions control the display of information on mobile devices and the workflow of the application. While designing an action you can provide for a "connected" behavior (e.g., a servlet or JSP) and a "disconnected" behavior (e.g., J2ME/pJava/Personal Profile). Should you wish to forgo some of the automation that is offered in the Studio interface, you can switch to writing Java code directly, as shown in Figure 2.

I found the Omni Mobile Studio development environment very easy to use, and the documentation is terrific. I was particularly impressed with the "Getting Started" guide.

Summary

One of the biggest advantages to the Java platform is the ability to leverage best-of-breed solutions. It's refreshing to work with a powerful product like the Omni Mobile Platform, as it blends so well with other Java investments that you already have. This latest release truly makes the product a robust solution for building and deploying complete mobile applications – both connected and disconnected. ☺

Jim Milbery is a vice president with William Blair Capital Partners, a venture capital firm based in Chicago. He has over 19 years of experience in application development and relational databases. He is the former applications editor for *Wireless Business and Technology*, the past product reviews editor for *Java Developer's Journal*, and the author of *Making the Technical Sale*.

jmilbery@williamblair.com

Snapshot

Target Audience: Java developers; mobile application developers; ERP, CRM, and SCM application managers

Level: Mid-level to advanced

Pros:

- Multi-device support
- Integration with leading J2EE application servers
- Support for ERP applications
- Aligo Omni Mobile Platform Studio
- Synchronization engine
- J2ME/pJava support for disconnected applications
- Support for 500+ mobile phones, PDAs, and Pocket PC devices

Cons:

- None significant



server – or directly to the database via Aligo's Data Access Builder, which provides connection pooling, fallback recovery, and transaction rollback for JDBC, XML, HTML, and JNI-enabled (and other) data sources. If you choose to run disconnected applications, the Omni Mobile Platform server will handle synchronization transparently for you, according to any set of business rules that you include with your applications.



Onno Kluyt

From Within the Java Community Process Program

From elections to new and changing JSRs

The approval of the JSRs within the JCP is a duty performed by the two Executive Committees. These are appointed bodies representing the members of the community. The ME EC oversees JSRs related to the consumer and embedded space while the SE/EE EC oversees JSRs for the desktop and server space. Together the two ECs also vote on the process-changing JSRs such as JSR 215. There are 16 voting members on each EC; Sun has a permanent seat on each EC. The 15 remaining seats have three-year terms with no limit to the number of terms a member can serve. One seat, one vote. Each year, in October and November, elections are held to appoint JCP members to the seats whose terms have come up. This year for the ME EC four nominated seats come up (Matsushita, Motorola, PalmSource, and Siemens) and two elected seats (BEA and Zucotto). For the SE/EE EC the names are Fujitsu, HP, IBM, Oracle (nominated), and Doug Lea (elected). Anyone who is a JCP member (corporate or individual) is eligible to vote in the elections and to serve on the Executive Committees. For more details go to <http://jcp.org/en/whatsnew/elections>. To see who is currently serving on the ECs go to <http://jcp.org/en/participation/committee>.

Profiling

There are two closely related JSRs quietly progressing through the process. JSR 163, led by Sun, specifies a profiling architecture for Java, and JSR 174, led by IBM, defines a monitoring and management specification for the virtual machine. Both JSRs are destined for inclusion in J2SE 1.5. JSR 163 will

supersede the current Java Virtual Machine Profiling Interface (JVMPi). Both APIs will allow for dynamically enabling and disabling the profiling and monitoring functions and have design objectives to minimize performance overhead. Also part of the next release of J2SE will be JSR 133, which is revising the memory model and thread specification, and is currently in Community Review. The goal of the revision is to enable developers to create multithreaded applications that are reliable and correct. Some of the focus areas are volatile variables, final variables, immutable objects, and the semantics of threads and locks. The fourth JSR in this area that has progressed into Community Review is Doug Lea's JSR 166, Concurrent Utilities, another JSR that will be included in J2SE 1.5. By providing a standard set of concurrency utilities, the task of writing multithreaded applications will become easier and generally improve their quality.

Before moving off the topic of J2SE, it will be of interest to those writing software for desktop environments that JSR 97, JavaHelp version 2, has now posted its Proposed Final Draft, thus nudging closer to completion. The enhancements over version 1.0 include merging, multi-topic printing, JFC ToolTip support, and additional navigators.

Java APIs for Communications

Two JSRs of note in this environment: JSRs 164 and 165, both led by Matsushita/Panasonic, have entered public review. The first JSR defines the JAIN SIMPLE Presence API, and the second, the JAIN SIMPLE Instant Messaging API. SIMPLE stands for "SIP

for Instant Messaging and Presence Leveraging Extensions" and is an IETF standard. SIP stands for "Session Initiation Protocol", also an IETF standard, and JAIN (still with me?) is the industry effort within the JCP defining Java APIs for the telecommunications and service providers markets. There are roughly 30 JSRs related to JAIN currently progressing through the JCP. JSR 164 provides a Java API to build support for presence servers such as subscription requests, authenticating and authorizing requests, and for presence clients, such as buddy lists, sending subscriptions and so on. JSR 165 provides a standard interface to exchange messages between SIMPLE clients in a secure and portable manner. Both JSRs are targeting both the J2ME and J2SE environments.

The J2ME Environment

The J2ME Web services specification, JSR 172, posted a second Proposed Final Draft. The specification defines an API to provide access from J2ME devices to Web services. Nokia's JSR 184, Mobile 3D Graphics, has also released a Proposed Final Draft. The Information Module Profile JSR, co-led by Siemens and Nokia, is now final. This is JSR 195.

Withdrawn JSRs

Sometimes JSRs are withdrawn by their submitters or spec leads. This can happen for various reasons, for example, a newer JSR subsumes the proposals of earlier JSRs or different directions are taken. Recently, JSR 159 was withdrawn in favor of JSRs 207 and 208. JSR 65 was withdrawn as the autoboxing facility proposed through JSR 201 takes precedence. ☺

—continued from page 54
ate a common abstract ancestor Person and two subclasses Employee and Consultant. The method raiseSalary must be declared abstract in the class Person while other methods should be concrete. This way we ensure that the subclasses do have the method named raiseSalary with a known signature, so we could use it in the ancestor without knowing its implement-

ation. Java interfaces should also be considered in cases when the same method must be implemented in multiple classes – in this case we do not need to use abstract ancestors. Actually, interfaces could be your only option if a class already has an ancestor that can not be changed.

One good interview technique is to impress the interviewer by elaborating on a related topic. Discussion of

abstract classes and interfaces gives you a good opportunity to show your understanding of polymorphism.

Summary

Use of abstract classes, interfaces, and polymorphism improves the design of any project by making it more readable and easily extensible. This also makes your code more compact and elegant. ☺

Onno Kluyt is the director of the JCP Program Management Office, Sun Microsystems.
onno@jcp.org

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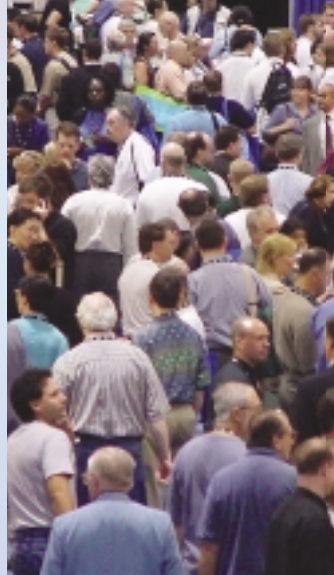
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- ▶ Team Leader
- ▶ Software Consultant

KEYNOTES & HIGHLIGHTED SPEAKERS



Allan Vermeulen

CTO, Amazon.com

Sept. 30 10:00 a.m.

"Web Services Foundations"

Allan Vermeulen, CTO and vice president at Amazon.com, directly oversees the Platform Technologies group. This group is responsible for guiding Amazon.com's technology architecture, including building and acquiring foundational components. Prior to his move to Amazon.com, Vermeulen was CTO and vice president of development at Rogue Wave Software. He holds a PhD in systems design engineering from the University of Waterloo.



John Magee

Vice President,

Oracle9i Application Server, Oracle

Oct. 1 10:00 a.m.

"J2EE Development on the Grid"

John Magee is vice president of Oracle9i Application Server and Oracle9i Developer Suite at Oracle. Mr. Magee has over 14 years of experience in the enterprise software industry and has held positions in product development, product management, and product marketing. In his current role, he 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.



David Litwack

Senior Vice President, Web

Application Development

Products, Novell

Sept. 30 2:00 p.m.

"Business Integration and IT" Keynote Panel

David A. Litwack is senior vice president of Web Application Development Products, responsible for the development and advancement of Novellis secure Web services strategy. Mr. Litwack assumed his current position in July 2002 following Novellis acquisition of SilverStream Software, a company for which Litwack had served as president and CEO since 1997.



John Schmidt

Leader of Systems Integration

and Middleware, Best Buy Co.

Sept. 30 2:00 p.m.

"Business Integration and IT" Keynote Panel

John Schmidt is the chairman of the Methodology Committee for the EAI Industry Consortium and leader of systems integration and middleware at Best Buy Co., a leading specialty retailer of consumer electronics, personal computers, entertainment software, and appliances.



Jon Bosak

Distinguished Engineer, Sun Microsystems

Jon Bosak organized and led the W3C working group that created the XML specification and then served for two years as chair of the W3C XML Coordination Group. At Sun, where he holds the title of Distinguished Engineer, Mr. Bosak sponsors projects intended to advance XML technology. He is currently chair of the Universal Business Language (UBL) Technical Committee of OASIS.



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. Dave has also been published in numerous technical journals, and is currently writing a series of contributed articles for *Java Developer's Journal*.



Anne Thomas Manes

Research Director, Burton Group

Anne Thomas Manes is a research director at Burton Group, a research, consulting, and advisory firm. Anne leads research for the Application Platform Strategies service. Named one of NetworkWorld's "50 Most Powerful People in Networking" in 2002, and one of Enterprise Systems Journal's "Power 100 IT Leaders" in 2001, Anne is a renowned technologist in the Web services space. Anne participates in standards development at W3C and OASIS.



Marc Fleury

President, JBoss

Marc Fleury, PhD, is chief technical officer for Telkel, Inc. He is the leader of the JBoss project (www.jboss.org), which is an open source EJB server. Marc is based out of Silicon Valley and founded the project upon leaving Sun Microsystems. He was one of the main developers behind JBoss 1.0 and 2.0. Marc is the "keeper" of the project. He founded the JBoss Group, a company regrouping the elite developers of JBoss to consult around JBoss.

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Conference at-a-Glance

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TUESDAY, SEPTEMBER 30	8:00AM – 4:00PM REGISTRATION			
	9:00AM – 9:50AM	The Next Phase in Evolution of J2EE	Using WSE 2.0	Web Services Management
	10:00AM – 10:50AM Keynote - "Web Services Foundations" - Allen Vermeulen, CTO and Vice President, Amazon.com			
	11:00AM – 6:00PM EXPO OPEN			
	2:00PM – 2:50PM Keynote Panel Discussion - Business Integration and i-Technology			
	3:00PM – 3:50PM	Ant Applied in "Real World" Web Services	Smart Devices in the Enterprise	Building Interoperable Web Services Using WS-I Basic Profile
	4:00PM – 4:50PM	Developing Applications with SWT	Using the Mobile Internet Toolkit	Web Services Orchestration
	5:00PM OPENING NIGHT RECEPTION			
WEDNESDAY, OCTOBER 1	8:00AM – 4:00PM REGISTRATION			
	9:00AM – 9:50AM	Empowering Java and RSS for Blogging	Introduction to ROTOR	ID, Please. The Case for Giving Web Services an Identity
	10:00AM – 10:50AM Morning Keynote - "J2EE Development on the Grid" - John Magee, Vice President, Oracle9i, Oracle			
	11:00AM – 4:00PM EXPO OPEN			
	2:00PM – 2:50PM Keynote Panel Discussion - Interoperability: Is Web Services Delivering?			
	3:00PM – 3:50PM	JUnit: Testing Your Java with JUnit	Using Portable .NET	WS-BPEL
	4:00PM – 4:50PM	JDK1.5: The Tiger	ASP.NET with Mono	UDDI: Dead or Alive?
	5:00PM – 6:00PM	Squeezing Java	Using WSE with IBM's Web Services Tool Kit	Web Services Choreography, Management, and Security - Can They Dance Together?
THURSDAY, OCTOBER 2	8:00AM – 4:00PM REGISTRATION			
	9:00AM – 9:50AM	Leveraging AOP in JBoss	Success Story: Eiffel, .NET, and Design by Contract for the Financial Industry	Strategies for Securing Web Services
	10:00AM – 10:50AM Technical Keynote			
	11:00AM – 11:50AM	Apache Axis	.NET IDE's	Web Services Progress Report
	12:00PM LUNCH			
	1:00PM – 1:50PM	Meeting the Challenges of J2ME Development	Windows SharePoint Services	The Seven Habits of Highly Effective Enterprise Service Buses (ESBs)
	2:00PM – 2:50PM Keynote Panel Discussion - Summit on Web Services Standards			
	3:00PM – 3:50PM	Simplifying J2EE Applications	BizTalk 2004	See www.sys-con.com for more information
4:00PM – 5:00PM	Integrating Java + .NET	See www.sys-con.com for more information	See www.sys-con.com for more information	

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Introduction to Xforms	Introducing OS X (Panther) What's New?
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XML and Enterprise Architecture: Technology Trends	Enterprise Java and OS X
Using XML Schemas Effectively in WSDL Design	Developing Web Services Using WebObjects
Canonical Documents for Your Business: Design Strategies	Cocoa, Carbon, Java: Application Frameworks for OS X (When to Use What)
XML and the Fortune 500	Securing OS X Applications
XML at Work in 'Fortune 500' Companies	Xserve: Ease of OS X and Power of Unix
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The workshop gives tips and techniques on how best to develop and deploy Web services and addresses topics such as RPC and Document Style Web services, static and dynamic invocation, stateless Web services and more. The second part of the workshop is dedicated to the new J2EE API for Web services available as part of J2EE 1.4.

Going through the hands-on labs at your own pace, you will learn how to publish a Java class as a J2EE stateless or stateful Web service, publish a session EJB as a J2EE Web service, and publish a J2EE Web service using JAX-RPC.

Space is LIMITED to the first 100 attendees. Register now for this FREE workshop. Computers will be provided by the Oracle Developer Days team with all the necessary software, so there's no need to bring your own computer.

AGENDA

- 7:30-8:00 am - Registration
- 8:00-9:00 am - Session #1 - Best Practices for Web Services Development & Deployment
- 9:00-10:00 am - Lab #1 - Publish a Java Class as a J2EE Stateless or Stateful Web Service
- 10:00-10:50 am - John Magee, VP, Oracle - Keynote (BREAK)
- 11:00 am-12:00 pm - Expo Floor Time
- 12:00-1:00 pm - Session #2 (WORKING LUNCH) - J2EE APIs for Web Services
- 1:00-2:00 pm - Lab #2- Publish a Session EJB as a J2EE Web Service
- 2:00-2:30 pm - Expo Floor Time (BREAK)
- 2:30-3:00 pm - Lab #3- Publish a J2EE Web Service Using JAX-RPC

PRESENTERS

- Arun Srinivasan, Director of Product Management, Java Tools, Oracle
- Rob Clark, Director of Product Management, J2EE, Oracle
- Mike Lehmann, Product Manager, Web Services, Oracle9iAS and Oracle9i JDeveloper, Oracle

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SPECIAL INSERT:
Web Services Edge West Conference & Expo Sept. 30 - Oct. 2, 2003

Java Technology Track

Java Technology Track



The Java Track features presentations aimed at the beginner, as well as the seasoned Java developer.

Sessions will explore the whole spectrum of Java, focusing on J2EE, application architecture, EJB, and J2ME. In addition the track will cover the latest in SWT, Ant, JUnit, open source frameworks, as well as an in-depth look into the vital role that Java is playing in building and deploying Web services.

Sessions will focus on:

- Enterprise Java 1.4
- Ant Applied in "Real World" Web Services
- Developing Application Frameworks with SWT
- Empowering Java and RSS for Blogging
- JUnit: Testing Your Java with JUnit
- JDK1.5: The Tiger
- Simplifying J2EE Applications
- Using IBM's Emerging Technologies Toolkit (ETTK)
- Apache Axis
- Meeting the Challenges of J2ME Development
- Integrating Java + .NET
- Squeezing Java

(JV1) The Next Phase in the Evolution of J2EE

BILL ROTH, SUN MICROSYSTEMS

Tuesday, September 30, 9:00 a.m. - 9:50 a.m.

Did you know that J2EE has developed to the point where companies can bring in millions of dollars a year selling J2EE-based application systems? This session will discuss the original plans for the evolution of the J2EE marketplace, and the companies that are capitalizing on completing one of the final stages of this process.



BIO: Bill Roth is currently technology evangelist for E.piphany. He previously was group marketing manager for J2EE at Sun Microsystems, and is a member of the *Java Developer's Journal* editorial board.

(JV2) Ant Applied in "Real World" Web Services

KYLE GABHART, GABHART CONSULTING

Tuesday, September 30, 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 every 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. In addition, it is compatible with any IDE or operating system.



BIO: Kyle Gabhart is an independent consultant, mentor, and published author, specializing in J2EE, XML, and Web services technologies. He is a prolific writer, with his most recent work displayed on IBM's developerWorks Web site in the 'J2EE Pathfinder' column. Kyle is highly regarded as a dynamic and enthusiastic public speaker with an innovative perspective on technology.

(JV3) Developing Applications with SWT

Tuesday, September 30, 4:00 p.m. - 4:50 p.m.

The Standard Widget Toolkit (SWT) provides a common, OS-independent, Java-based API for widgets and graphics implemented in a way that allows tight integration with the

underlying native window system. The Eclipse project and the various tools that plug in to it use SWT for presenting information to the user. This session will provide a general overview of SWT and introduce its basic concepts and classes. See www.sys-con.com/edge for further details on this session.

(JV4) Empowering Java and RSS for Blogging

JASON BELL, IT DEVELOPMENT MANAGER

Wednesday, October 1, 9:00 a.m. - 9:50 a.m.

One of the fastest growing areas over the last few years is the blogging community. The ease with which you can post and publish information has enabled everyone to become his or her own publisher. One of the powers of blogs has been the syndication of data via the RSS (XML) protocol. Discover how you can easily produce and consume RSS feeds within your Java applications for wider appeal and hook into JavaBlogs.



BIO: Jason Bell is Java developer and IT development manager for a B2B portal in the UK. He also contributed to a number of open source projects and is an advocate of everyone reading the API docs.

(JV5) JUnit: Testing Your Java with JUnit

Wednesday, October 1, 3:00 p.m. - 3:50 p.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. See www.sys-con.com/edge for further details on this session.

(JV6) JDK 1.5: The Tiger

CALVIN AUSTIN, SUN MICROSYSTEMS

Wednesday, October 1, 4:00 p.m. - 4:50 p.m.

Java 1.5 is the next major release of Java and with it comes a whole host of new enhancements and additions to the language. 1.5 promises a lot. Attend this session and discover the wonders that await the Java community.

BIO: Calvin Austin is the lead engineer on Sun Microsystems' port of the Java 2 Platform, Standard Edition (J2SE) to the Linux OS. He has been with Java Software since its inception six years ago. Calvin is the specification lead for JSR-176, which defines the J2SE 1.5 ("Tiger") release contents.

(JV7) Squeezing Java

ALAN WILLIAMSON, JAVA DEVELOPER'S JOURNAL

Wednesday, October 1, 5:00 p.m. - 6:00 p.m.

Java is a very powerful language, and while it offers the developer 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) fewer bugs. We'll look at the "do's 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 (www.n-ary.com) and rumor has it he welcomes all suggestions and comments!

(JV8) Leveraging AOP in JBoss

MARC FLEURY, PH.D., JBOSS

Wednesday, October 1, 5:00 p.m. - 6:00 p.m.

This session will explore the JBoss Aspect Oriented Programming (AOP) framework. It will define AOP and discuss its implementation in the JBoss application server, showing



how a microkernel combined with simple AOP technology can enable the creation of generalized containers. From small single purpose embedded controls to large enterprise systems, JBoss middleware enables easy system assembly by AOP and aspects. This session will focus on the aspects themselves, moving beyond the logging examples to cover all the standard aspect technology that has been present in JBoss for the past 3 years, including persistence, caching, invocations, transactions and acidity as aspectized components that can be reused in applications.



BIO: Marc Fleury, PhD. is chief technical officer for Telkel, Inc. He is the leader of the JBoss project (www.jboss.org/), which is an open source EJB server. Marc is based out of Silicon Valley and founded the project upon leaving Sun Microsystems. He was one of the main developers behind JBoss 1.0 and 2.0., and is the "keeper" of the project. Marc is a graduate of the French Ecole Polytechnique with a degree in mathematics and holds a PhD in physics for work done at MIT as a visiting scientist.

(JV9) Apache Axis

CHRIS HADDAD, COBIA COMMUNICATIONS

Thursday, October 2, 11:00 a.m. - 11:50 a.m.

Apache Axis is the very popular SOAP engine that includes everything you need to start producing Web services. Discover just what Axis is, and how you can utilize the power of this free engine to kick start your Web services.

(JV10) Meeting the Challenges of J2ME Development

Thursday, October 2, 1:00 p.m. - 1:50 p.m.

Synchronization is an important component in building mobile applications that can operate offline to review, capture, or change data that will later be reconciled with enterprise data on a central server. Today, distributed clients with limited memory and intermittent connectivity, such as cellular phones and PDAs, are increasingly used to access multiple server-side enterprise applications and data. This presentation will demonstrate a flexible yet powerful framework for managing data and synchronization in the Java environment (J2EE, J2ME/pjava). See www.sys-con.com/edge for further details on this session.

(JV11) Integrating Java + .NET

DEREK FERGUSON, .NET DEVELOPER'S JOURNAL

Thursday, October 2, 3:00 p.m. - 3:50 p.m.

Contrary to popular belief, you can still use Java (J#) on Microsoft's .NET platform. While the flavor may not be the latest JDK we know and love, J# offers other goodies and trinkets to accelerate your .NET solution. Find out what they are.



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* (Apress).

(JV12) Simplifying J2EE Applications

Thursday, October 2, 4:00 p.m. - 4:50 p.m.

TODD LAINGER, BEST BUY CO., INC.

J2EE is a large, complex specification for server-side, Web-enabled application development. Over the past few years, I have led many teams through the J2EE jungle, trying to steer them away from the hype and keep them focused on delivering rock-solid end user applications. The purpose of this tutorial is to discuss a variety of tips, tricks, and lessons I have learned so you and your teams can develop J2EE applications better, faster, and simpler than before.



BIO: Todd Lainger is currently employed as a software construction fellow at Best Buy Co., Inc. He has over 10 years of experience developing large, mission-critical software systems for engineering and business organizations. Todd is also an experienced instructor, mentor, conference speaker, and published author, and has a master's degree in software engineering.

Java University Program

October 1

October 2

SUN MICROSYSTEMS

Architecting Web Services with Java 2 Platform, Enterprise Edition (J2EE)

Wednesday, October 1, 2003

Who Should Attend

Developers and software architects with experience using the Java programming language, and some knowledge of XML who are interested in discovering how Java technology can deliver Web services for multi-tier applications.

Overview

Web services provide an excellent mechanism to create integrated architectures for B2B solutions. The Java 2 Platform, Enterprise Edition (J2EE) is an excellent API for creating and deploying Web services. When used in conjunction with the Java technology APIs for XML (JAX family of APIs), powerful and adaptable architectures can be created that offer all the advantages of J2EE technology including portability, scalability and interoperability. The core of this seminar deals with investigating the JAX family of APIs and how they can be used to create Web services.

Benefits

- Understand Web services and their use in the enterprise
- Identify how servlets and JavaServer Pages (JSP) can be used with Web services
- Recognize the use of the Simple Object Access Protocol (SOAP)
- Be able to utilize the Java technology API for XML Messaging (JAXM) with SOAP
- Recognize the Java technology API for XML Binding (JAXB) and its use in the middle tier
- Learn about the Java technology API for XML Registries (JAXR)
- Investigate the Java technology API for XML-based Remote Procedure Calls (JAX-RPC)

Java 2 Platform: Architect Certification Fast Path

Thursday, October 2, 2003

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).

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.

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.

Go to www.sys-con.com/edge for more details about the Java University Program

Register Online at WWW.sys-con.com/edge

SPECIAL INSERT:
Web Services Edge West Conference & Expo Sept. 30 - Oct. 2, 2003

Web Services Track

Web Services Track



Presentations will include discussions of security, interoperability, the role of UDDI, progress of the standards-making bodies, SOAP, and BPM. Case studies cover the design and deployment of Web services in the marketplace.

Sessions will focus on:

- Interoperability
- Enterprise Networks
- Web Services Management
- Web Services Standards
- Web Services Orchestration
- Security (WS-Security, SAML)
- BPEL4WS
- UDDI: Dead or Alive?
- ebXML & Web Services
- EAI & Web Services
- RPC vs Documents: Uses and Differences
- User Interfaces for Web Services
- Web Services Best Practices
- Service-Oriented Architecture

(WS1) Web Services Management: Managing the Impact of Change

JAMES PHILLIPS, ACTIONAL

Tuesday, September 30, 9:00 a.m. - 9:50 a.m.

Adoption of Web services technology is well underway in the Global 2000. It is impossible to ignore the numerous articles and speeches from CIOs declaring their adoption of Web services as high-priority strategic IT initiatives. Whereas the service-oriented approach to application architecture was meant to accelerate the responsiveness of the IT organization, the impact of the changes to the service network and the ripple effects that ensue can lead to precisely the opposite result. Change is easy and affordable, but the impact of change can be unmanageable and expensive. To truly reap the benefits of the service-oriented approach to application architecture, customers must have a way to manage the impact of change in their enterprise service network.



BIO: James Phillips has worldwide responsibility for Actional's product and market strategy and market execution. Prior to joining Actional, James served as chief strategy officer and vice president of product marketing and business development with Ensim Corporation, and has held senior marketing management, software engineering, and business development roles with Intel, Intuit, Synopsys, and Central Point Software.

(WS2) Building Interoperable Web Services Using WS-I Basic Profile

KEVIN LIU, SAP LABS, LLC

Tuesday, September 30, 3:00 p.m. - 3:50 p.m.

The promise of Web services interoperability is based on a set of standards, including XSD, SOAP, WSDL, and UDDI. However, early interoperability experiments such as the SOAP Builder activity have proven that making these technologies seamlessly work together, inter- or intra-enterprises, is a bigger challenge than most of us expected. Most of the Web services technologies are still in the standardization process, and Web services platforms have to be based on prestandard draft specifications. The inconsistencies and ambiguities left in these initial drafts can easily lead to different interpretations for the same feature and substantially compromise the promised interoperability.

The presentation explains how WS-I Basic Profile addresses these challenges, and what the key techniques are that you can get from the profile that can make your Web services interoperable. It explains why the profile disallows SOAP encoding and why RPC style should give way to document style.

BIO: Kevin Liu is an architect of XML Web services technologies at SAP Labs in California. Kevin helps drive the adoption of Web services technologies in SAP's strategic products, and represents SAP in various standard bodies. Kevin has over 10 years of experience in software engineering and the financial industry. He holds multiple master's degrees in information management, finance, and economics.

(WS3) Web Services Orchestration

CHRIS PELTZ, HP

Tuesday, September 30, 4:00 p.m. - 4:50 p.m.

The real value of Web services will come as we start finding standard ways to connect these distributed components in a more reliable fashion. One of the key enablers to this will be web services orchestration. This session introduces web services explains some of the requirements for connecting we services together. A history of key standards will be provided, including XLANG, and WSFL. A comparison will be drawn between WSCI and BPEL4WS, and where each might be appropriate in an architecture. The presentation will conclude with a case study demonstrating the use of orchestration technologies to connect web services together.



BIO: Chris Peltz is a senior software consultant within HP's Developer Resources Organization. He provides technical and architectural consulting to enterprise customers in the areas of 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.

(WS4) ID, Please. The Case for Giving Web Services an Identity

ASHISH LARIVEE, NOVELL

Wednesday, October 1, 9:00 a.m. - 9:50 a.m.

Without identity management, Web services can be consumed by anyone. The challenge for Web services developers is to provide appropriate access based on the user's identity. As identity management moves into the forefront of technology, directory services will evolve from simple LDAP repositories used for authentication and storage to robust engines that provide identity integration, access management, and policy enforcement. This presentation will discuss how identity management and directory services provide a robust solution for Web services authentication, authorization, and single sign-on.

BIO: With more than nine years of experience in the software industry, Ashish Larivee has designed and developed many enterprise applications across a variety of platforms including Microsoft, Lotus Notes/Domino, and the J2EE platform. In 1999, Ashish joined SilverStream Software, acquired by Novell in July 2002, and has served in various roles in consulting, development, and technical marketing. In her current role, she helps define the strategy and product direction across Novell's Web application development products.

(WS5) WS-BPEL

JOHN EVDEMON, MICROSOFT

Wednesday, October 1, 3:00 p.m. - 3:50 p.m.



BIO: John Evdemon is program manager, industry standards, industry solutions enablement, for Microsoft, and is cochair of OASIS' Business Process Execution Language TC. He is an XML and e-business expert, having served as CTO/director of XML-related products for both a large integration platform vendor and a small XML-centric start-up, and has been designing and deploying enterprise systems on a wide variety of platforms for over 15 years. He is an invited expert with the W3C XML Core Syntax Working Group and has chaired several industry-specific XML initiatives. An associate editor of *XML-Journal*, John is also a regular contributor to journals, books, and online forums and is writing a book on XML. See www.sys-con.com/edge for further details on this session.

(WS6) UDDI: Dead or Alive?

ANNE THOMAS MANES, THE BURTON GROUP

Wednesday, October 1, 4:00 p.m. - 4:50 p.m.

When UDDI was first announced in September 2000, IBM and Microsoft predicted that it would be a fundamental component of the Web services infrastructure. Three years later, UDDI has still seen only very modest adoption. So what is the future of UDDI? Will it ever live up to the early predictions? Will it enable dynamic discovery and utilization of Web services? Why should you even consider using it? Although it's had a slow start, UDDI is, in fact, a core component of the Web services infrastructure. This session explores the Web services registry specification and examines user guidelines and best practices.



BIO: Anne Thomas Manes is a research director at Burton Group, a research, consulting, and advisory firm. Anne leads research for the Application Platform Strategies service. Named one of NetworkWorld's "50 Most Powerful People in Networking," in 2002 and one of *Enterprise Systems Journal's* "Power 100 IT Leaders," in 2001, Anne is a renowned technologist in the Web services space. Anne participates in standards development at W3C and OASIS. She is a frequent speaker at trade shows and author of numerous articles and the book *Web Services: A Manager's Guide*.

(WS7) Web Services Choreography, Management, and Security – Can They Dance Together?

PAUL LIPTON, COMPUTER ASSOCIATES

Wednesday, October 1, 5:00 p.m. - 6:00 p.m.

Web services choreography, management, and security are among the principal challenges implementers of service-oriented architectures face in their efforts to create a more cost-effective and agile IT infrastructure, despite the fact that significant progress has been made in various standards organizations such as the W3C and OASIS. There is still much confusion in the IT community about the standards, which are at various stages of maturity. Also, their relevance to enterprise IT and how they might work together is often unclear.

This session begins with a useful overview of standards in these three critical areas of Web services: choreography, management, and security. We will then discuss the role of each in the enterprise, and conclude with an examination of how these three areas might work together to solve the real challenges facing IT in its efforts to bring greater utility, flexibility, and agility to the enterprise.



BIO: Paul Lipton is Computer Associates' Web services technology leader for the field services organization and a technology strategist in the office of the CTO. He has been an architect and developer of enterprise systems for more than 20 years, and has worked closely with key CA customers to architect distributed solutions using J2EE, .NET, wireless, and Web services technology. Paul has represented CA in various standards organizations, and has participated in the Java Community Process. He has published magazine articles on many technologies including Web services, Java, .NET, EAI, wireless technology, and distributed systems.

(WS8) Strategies for Securing Web Services

MARCK SECRIST, HP

Thursday, October 2, 9:00 a.m. - 9:50 a.m.

Web services standards for security are just beginning to emerge and stabilize, yet lack of security standards is listed as the top barrier to Web services adoption. Many project teams are reluctant to adopt Web services due to the risk associated with immature and changing standards. This session will look at the issues associated with securing Web services, and cover the important standards for Web services security. It will conclude by exploring strategies for securing Web services in ways that allow developers to get started with Web services while isolating themselves from standards that are still in a state of flux.



BIO: Mark Secrist is a senior consultant for the HP Developer Resource Organization with more than 10+ years of experience involving distributed object technologies and building N-tier, Web-based applications. He currently consults with enterprise customers on J2EE and Web services development. Mark has also published technical white papers on J2EE, mobile, and Web services development.

(WS9) Web Services Progress Report

MICHAEL CHAMPION, SOFTWARE AG

Thursday, October 2, 11:00 a.m. - 11:50 a.m.

Web services have been the buzz for the last couple of years, but the concept remains confusing to many. New "standards" are proposed on a regular basis, but they overlap and seem to form the same fault lines as previous industry politico-strategic controversies. Now analysts and writers are talking about "service-oriented architectures," further bewildering most nonspecialists. Throughout all this, a small but passionate group has been arguing that many of the ideas coming from the Web services community are antithetical to the principles of the Web and are unlikely to ever work on an Internet scale. The W3C Web Services Architecture Working Group is trying to determine a consensus position on key architectural issues concerning Web services and their relationship to XML and the Web. This presentation provides a progress report after an approximately 18-month effort to distinguish the Web services architectural principles from the marketing agenda of individual companies.



How to Develop, Deploy, and Manage Web Services USING IBM TOOLS

Are you a developer, product manager, or software architect interested in learning how to develop, deploy, and manage Web services? If so, this technical seminar – where IBM experts will review the standards initiatives behind some of these technologies, the latest developments, and their future roadmap – is for you!

What you will discover by attending this technical seminar

- How to develop and deploy Web services using IBM tools
- How to use IBM WebSphere Studio Application Developer to extend Java components as Web services using WSDL
- How to implement Web Services Hosting Technology to provision and meter Web services without changing code or the actual service implementation
- Each attendee will receive IBM software products that support Web services, development tools, helpful tutorials, and insightful articles.

Course highlights

- Real-world implementation
- Developing and deploying SOAP-enabled Web services
- Registry operations and programming with UDDI4J Version 2
- IBM WebSphere Studio Application Developer
- RAS and Web services
- Web services stack and WebSphere Application Server Version 5.0
- Emerging Web services technologies – WSFL, WSIL, WSUI, etc.
- Developer support – IBM Web Services Toolkit Version 3.0, resources, tools, products, Web sites, Business Partner support, education, etc.

SEPTEMBER 30

Presenter

Willy Farrell, Sr. Software Engineer, IBM

Willy Farrell is a senior software engineer in the IBM Developer Skills Program. As part of the developerWorks team, he provides relevant technical information and insight to developers on the latest e-business and industry trends through Web content, articles, speaking engagements and consulting to faculty at IBM Scholars Program member universities.

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BIO: Michael Champion is a research and development specialist at Software AG, working out of Ann Arbor, Michigan. He has been a software developer for 20 years, working primarily in the area of middleware for client/server document and image management systems. He has been active in the World Wide Web Consortium'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. Michael is now cochair of the Web Services Architecture Working Group.

(WS10) The Seven Habits of Highly Effective Enterprise Service Buses (ESBs)

DAVE CHAPPELL, SONIC SOFTWARE

Thursday, October 2, 1:00 p.m. - 1:50 p.m.

Gartner, Inc., has defined a new class of application integration infrastructure called an enterprise service bus (ESB). An ESB is a standards-based integration product that reliably connects and orchestrates the interaction of hundreds of application endpoints spanning a global organization. Because of their significant differences from application server products and proprietary integration brokers, ESBs represent a compelling third option for businesses in the market for integration technology.

What is an ESB? How can you properly distinguish this new product category and compare it with other offerings on the market? Dave Chappell, chief technology evangelist for Sonic Software, will examine the seven key characteristics of an ESB in depth.



BIO: Dave Chappell is vice president and chief technology evangelist for Sonic Software, the leading provider of integration products and services for the real-time enterprise. Dave is coauthor of *Java Web Services*, *Professional ebXML Foundations*, and *The Java Message Service*, and a frequent contributor to *Web Services Journal*.

XML Track

XML Technology Track



Presentations will focus on the various facets of XML technologies as they are

applied to solving business computing problems. Sessions will include emerging standards in XML Schemas, XML repositories, industry applications of XML, applying XML for building Web services applications, XML/XSLT/ XQuery-based programming using Java/.NET, XML databases, XML tools and servers, XML-based messaging, and the issues related to applying XML in B2B/EAI applications. The XML Track is geared for audiences ranging from beginners to system architects and advanced developers.

Sessions will focus on:

- XML Standards and Vocabularies
- Introduction to XForms
- Securing Your XML and Web Services Infrastructure
- XQuery Fundamentals: Key Ingredients to Enterprise Information Integration
- XML and Enterprise Architecture: Technology Trends
- Standards-Based Enterprise Middleware Using XML/Web Services
- XML and Financial Services
- Canonical Documents for Your Business: Design Strategies
- XPath/XSLT 2.0: What's New?
- XML Schema Best Practices
- XML in EAI, Enterprise Portals, Content Management

(XM1) Introduction to XForms

T.V. RAMAN, IBM RESEARCH

Tuesday, September 30, 9:00 a.m. - 9:50 a.m.

This presentation will introduce W3C XForms, including details about how XForms enables the last mile of connecting the end user to Web services. XForms user agents provide an easy-to-use, browser-based interface that enables the end user to interact with information technologies that have been published as Web services. As the Web moves from being a desktop-only phenomenon to a means of ubiquitous electronic access, Web transactions need to be available from a variety of end-user access devices ranging from desktop computers to smart phones. The XForms authored interface is well suited for delivery to a variety of interaction modalities and end-user devices, thus assuring content developers of the widest audience for their transaction-based applications. From the user's perspective, XForms revolutionizes the way business-critical information is collected and published on the Web, enabling information technologists to

continue to model business data using abstract structures that are amenable to machine processing. XForms binds a user-friendly Web browser interface to such abstract XML models, thereby empowering the end user to edit and update these abstract structures. In this sense, XForms enables a standard Web browser to associate editable views to the underlying XML models. This ability to view and edit XML documents from within a standard Web browser is likely to prove a key empowering technology.



BIO: T.V. Raman works in IBM Research on multimodal user interfaces and is the author of *Auditory User Interfaces*. He is the editor of the user interface chapter of the XForms 1.0 specification and is an active participant in a number of W3C working groups including XForms, voice browser, and XHTML. His research interests are primarily auditory user interfaces and structured electronic documents, and his previous work includes AsTeR – Audio System For Technical Readings, Aural CSS, and Emacspeak – the complete audio desktop.

(XM2) Securing XML and Web Services Applications

PHIL STEITZ, AMERICAN EXPRESS

Tuesday, September 30, 3:00 p.m. - 3:50 p.m.

Securing Web services is a big challenge for companies moving toward service-oriented architectures. We will discuss some practical strategies for meeting this challenge using standards and technologies available today. Key technical tradeoffs in the areas of performance, scalability, manageability, availability, and integration cost will be considered as we work through the details of a typical integration use case. We will also discuss business and organizational issues related to trust and identity management. The session will conclude with a brief survey of the standards and technology landscape and some strategies for ensuring that investments made today will continue to pay benefits into the future.

BIO: Phil Steitz is vice president of e-commerce applications development at American Express. Phil has more than 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. Phil holds a PhD in mathematics from the University of Maryland.

(XM3) UBL: The Universal Business Language

JON BOSAK, SUN MICROSYSTEMS

Tuesday, September 30, 4:00 p.m. - 4:50 p.m.

Web services technologies promise to revolutionize electronic business, but global interoperability of business processes cannot occur without the semantic standardization of the messages exchanged in business transactions. This presentation will describe the OASIS UBL project to create standard XML Schemas for basic business documents, explore the relationship of UBL-based business to traditional EDI, and note the explosive potential of standard markup combined with reliable XML messaging.



BIO: Jon Bosak organized and led the W3C working group that created the XML specification and then served for two years as chair of the W3C XML Coordination Group. At Sun, where he holds the title of distinguished engineer, Jon sponsors projects intended to advance XML technology. He is currently chair of the Universal Business Language (UBL) Technical Committee of the Organization for the Advancement of Structured Information Standards (OASIS).



(XM4) Standards-Based Enterprise Middleware Using XML/Web Services

ANDY ASTOR, WEBMETHODS

Wednesday, October 1, 9:00 a.m. - 9:50 a.m.

Some say that standards-based enterprise middleware is not yet mature enough for industrial-strength usage, and that proprietary vendor products are the only practical alternative. Others insist that standards-based middleware is "ready for prime-time," and that proprietary vendors will be out of business within a year. The truth is that each of these extremes contain dubious hype, and the truth falls somewhere between these schools of thought. This session seeks to separate fact from fiction, and to offer a model for understanding both the current and future states of standards-based middleware.



BIO: Andy Astor joined webMethods in 2002 as vice president of enterprise Web services. In this role, he is responsible for driving the company's Web services strategy and execution. Prior to joining webMethods, Andy was a vice president at D&B, where he led worldwide customer-facing products, including all Web- and Internet-based applications. His work at D&B also included the development and launch of one of the earliest commercial Web services. Prior to his tenure at D&B, Andy held leadership positions at American Management Systems and Ernst & Young, both large systems integration and consulting firms.

(XM5) XML and Enterprise Architecture: Technology Trends

HITESH SETH, IKIGO

Wednesday, October 1, 3:00 p.m. - 3:50 p.m.

XML is a key ingredient of a number of technology solutions. Whether it's serving up enterprise portals, integrating diverse systems (EAI), serving Web services, or driving content management, support for XML has been a key trend in major off-the-shelf packaged applications. With Web services, XML support has been extended to mission-critical ERP and CRM systems. This presentation takes a look at some of the key trends in using XML in these applications.



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

(XM6) Using XML Schema Effectively in WSDL Design

CHRIS PELTZ, HP

Wednesday, October 1, 4:00 p.m. - 4:50 p.m.

Developers building Web services today are beginning to see the value of using the document-style approach over RPC. Recent experience shows that taking full advantage of document-style Web services requires a strong knowledge of XML Schemas and related XML standards. This session will present a number of important tips and techniques for properly using XML Schemas in the design of a Web services interface, including the importance of XML-based development tools, considerations for binding between XML and underlying objects, WSDL reusability through XML Schemas, and XML Schema naming best practices.



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

(XM7) Canonical Documents for Your Business: Design Strategies

DAVID CONNELLY, OPEN APPLICATIONS GROUP, INC.

Wednesday, October 1, 5:00 p.m. - 6:00 p.m.

The ability to change rapidly when business processes change is key for successful enterprises in today's world. A factor critical to enabling this change is the integration of all of an organization's business software applications in a way that is much faster and less expensive than current methods. Many organizations are taking advantage of the open standards-based protocols underlying Web services to integrate systems quickly and inexpensively. But before Web services can achieve its full potential, it needs a rich and mature business language that can be used for both e-business and application integration. The OAGIS XML language is the technology-neutral, horizontal business language that enables enterprises to fully leverage Web services protocols. This presenta-



tion will discuss the OAGIS CANONICAL Model, why and how it can make a difference, and strategies for using the OAGIS XML documents within the CANONICAL Model in your business environment.



BIO: David Connelly is president and CEO of the Open Applications Group, Inc. Before joining the OAGI, David worked in various capacities at customer organizations and software vendors. He graduated from George Tech in 1975 with a BS in industrial engineering.

(XM8) XQuery Fundamentals: Key Ingredients of Enterprise Information

PAUL COTTON, MICROSOFT

Thursday, October 2, 9:00 a.m. - 9:50 a.m.

The W3C XML Query Working Group was chartered in September 1999 to develop a query language for XML documents. The goal of the XML Query Working Group is to produce a formal data model for XML documents with namespaces based on the XML Infoset and XML Schemas, a set of query operators on that data model, and then an XQuery language with a concrete canonical syntax based on the proposed operators. In May 2002 the XML Query WG and XSL WGs published a complete new set of XQuery 1.0/XPath 2.0/XSLT 2.0 documents. This presentation will provide an overview of the XQuery and XPath languages and their current status. It will also outline the relationship of the work of the XML Query WG to other W3C XML standards, especially XML Schema. The status of the WG's efforts to add support to XQuery for full-text retrieval and an update language will also be discussed.



BIO: Paul Cotton is program manager of XML standards with Microsoft Canada. Paul has been active within the W3C XML activity since 1998 and has been the chairman of the W3C XML Query WG since it was formed in 1999. Paul was elected to the first W3C Technical Architecture Group (TAG) in December 2001 and re-elected in December 2002. The W3C TAG is responsible for defining the W3C's view of the architecture for the Web. Paul is also a member of the WS-I Board of Directors and chair of the WS-I Basic Service Profile Working Group. Paul has more than 30 years of experience in the IT industry.

(XM9) XML at Work in the Fortune 500

Thursday, October 2, 11:00 p.m. - 11:50 p.m.

The objective of this session is to understand how XML has been a strategic investment with a Fortune 500 company. This session highlights the process of how support for XML was cultivated within the company and its partners and how XML was transformed from a cool technology trend to a necessity and a corporate standard. See www.sys-con.com/edge for further details on this session.

(XM10) Designing XML Schema Best Practices

AYESHA MALIK, OBJECT MACHINES

Thursday, October 2, 1:00 p.m. - 1:50 p.m.

XML Schemas constrain and formalize the vocabulary and grammar of XML documents. As XML is fast becoming the data transport format of the future, organizing the structure of the XML, as outlined by schemas, is becoming key to successful interoperability and implementation. Developers experienced in object-oriented design know that a flexible architecture ensures consistency throughout the system and helps to accommodate growth and change. This presentation uses an object-oriented framework to show you how to design XML Schemas that are extensible, flexible, and modular. Three principles of object-oriented design – encapsulation, inheritance, and polymorphism – are discussed in light of XML Schemas.



BIO: Ayesha Malik is a senior consultant at 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.

OS X Track

OS X Track

Mac OS X

OS X represents a new wave of operating systems. It combines the ease of use of a Mac with the power of Unix. Sessions in this track will highlight the use of the Mac OS X platform in applications and Web services development, deployment, and management.

Sessions will focus on:

- Introducing OS X Panther: What's New?
- Quick Applications Using AppleScript
- Enterprise Java and OS X
- Developing Web Services Using WebObjects
- Xserve: Ease of OS X and Power of Unix
- Introducing Quartz: 2D Graphics for Apple
- OS X for the Unix Developer
- Securing OS X Applications
- Java and OS X: A Perfect Marriage
- Programming Rich User Interfaces Using Cocoa



(OS1) Introducing OS X Panther: What's New?

Tuesday, September 30, 9:00 a.m. - 9:50 a.m.

The recently announced Mac OS X version 10.3, commonly known as Panther, boasts a number of key enhancements to the features and technologies introduced by OS X. This presentation looks at some of these new and exciting features and how they can benefit individuals and businesses considering deploying OS X.

(OS2) Programming Rich User Interfaces Using Cocoa

Tuesday, September 30, 3:00 p.m. - 3:50 p.m.

An evolution from NeXTStep APIs, Cocoa is a collection of advanced, object-oriented APIs for the development of OS X applications using Objective C and Java. Included in OS X is a set of Java classes that allows Java developers to build enriched multimedia applications based on the Cocoa framework. This presentation highlights the key benefits of the Cocoa application development model w.r.t. It also points out some areas where the Cocoa framework can provide the much-needed edge.

(OS3) Quick Applications Using AppleScript

Tuesday, September 30, 4:00 p.m. - 4:50 p.m.

A peer to the Aqua GUI, AppleScript is the language interface for Mac OS X. It can control and communicate between applications, databases, networks, and even remote Web services. AppleScript provides the technology needed for applications to automate workflow processes and extend the life of off-the-shelf products. Learn to build cross-applications using AppleScript Studio in this fast-paced introduction to AppleScript... scripting like you've never seen before.

(OS4) Java and OS X: A Perfect Marriage

Wednesday, October 1, 9:00 a.m. - 9:50 a.m.

Mac OS X sports a new look – not just a new look-and-feel on the outside, but also a new look on the inside. Mac OS is built on top of a BSD Unix-based core. An exciting aspect of the Mac OS X release is the integration of the Java 2 Platform with OS X. This presentation introduces OS X to users, focusing on Apple's Java implementation, platform support, Web browser support, and the tools that are available to help developers build great-looking Java applications for OS X.

(OS5) Enterprise Java and OS X

Wednesday, October 1, 3:00 p.m. - 3:50 p.m.

With built-in support for the Java 2 Platform in OS X operating systems and the evolution of the OS X Server platform, OS X will be considered a platform for not only developing and deploying rich-client applications but also for server-side applications. A number of options exist in this area. First and foremost is Apple's own WebObjects platform. In addition, OS X Server introduced bundling Apache Tomcat Server with the OS X

Server and it was recently announced that Apple will bundle the JBoss Application Server with the new version of OS X Server. In addition to these "bundled" choices, a number of third parties have announced support for their own application servers for the OS X platform. This session previews some of the supported enterprise Java-based server-side technologies for the OS X platform.

(OS6) Developing Web Services Using WebObjects

Wednesday, October 1, 4:00 p.m. - 4:50 p.m.

WebObjects is Apple's framework and tools for rapid application development and deployment of server-side Java applications. Version 5.2 brings support for standards-based Web services. It allows developers to build or use standards-based Web services without getting into the details of writing low-level SOAP, XML, or WSDL. The environment includes a set of tools that enable code-free generation, configuration, and testing of Web services from existing data assets. This session previews some of these changes and walks attendees through the "really rapid" Web services development environment – WebObjects.

(OS7) Cocoa, Carbon, Java: Application Frameworks for OS X

Wednesday, October 1, 5:00 p.m. - 6:00 p.m.

From a development perspective, OS X provides multiple application frameworks. Choice is good, but it's important to know when to choose what. This presentation will provide guidelines on when to use which framework. Carbon is the traditional Mac OS API and emphasizes complete backward compatibility. Cocoa is a development environment for OS X "native" applications and represents a new framework for the development of OS X applications. Another key consideration is Apple's support for the latest version of the Java platform. Java is treated as a first-class citizen in OS X, and developers are expected to build and deploy cross-platform applications on this key framework.

(OS8) Securing OS X Applications

Thursday, October 2, 9:00 a.m. - 9:50 a.m.

Whether you're developing a banking application or just a graphics-based engineering application, security is an integral aspect of design and development. When applications are available beyond the firewalls, you must consider the additional challenges of securing your enterprise and customer data. Internally, you have to worry about potential misuse of rights. When it comes to OS X development, securing applications is no different. The operating system provides built-in support for LDAP directory services, making it easier to maintain consistent user profiles, and provides security APIs to a broad set of applications. This presentation provides a technology overview and a security checklist.

(OS9) Xserve: Ease of OS X and Power of Unix

Thursday, October 2, 11:00 a.m. - 11:50 a.m.

Xserve combines the ease of Mac OS X, the power of Unix, and the reliability of a server-grade solution. A one-of-a-kind deployment environment, Xserve promises to do for the production server's landscape what iBooks, iMacs, Power Macs, and PowerBooks have done for the desktop landscape – make it simple to use and easier to deploy. This presentation highlights the various platform-level capabilities of Xserve, including OS X Server.

(OS10) OS X for the Unix Developer

Thursday, October 2, 1:00 p.m. - 1:50 p.m.

The heart of a great-looking OS X operating system is a Unix Core. Unix developers should find themselves at home with the OS X platform. The same command-line utilities still work; however, you get ease-of-use as well. While you'll always have the flexibility of reverting to scripts and command-line tools, in a number of cases you won't need to. And even if you do, you can then make it simple for others by making the script available as a tool to others. This session looks at OS X from a Unix developer's perspective, highlighting key similarities and differences between the two environments.

(OS11) Introducing Quartz: 2D for Apple

Thursday, October 2, 3:00 p.m. - 3:50 p.m.

A key highlight of OS X architecture is Quartz, the lightweight window server and PDF-based 2D graphics-rendering library. Quartz provides crisp graphics, and anti-aliased fonts, and blends 2D, 3D, and QuickTime content together with transparency and drop shadows. Quartz Extreme boosts the performance of the Quartz rendering system with hardware-accelerated graphics. Developers get access to the rich functionalities available in Quartz through the Quartz 2D Core Graphics API for the Carbon framework and NSView, NSImage, and NSBezierPath classes for Cocoa developers. This session provides a technical introduction to Quartz and highlights application scenarios in which developers can utilize these rich capabilities.

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\$1 billion – \$9.9 billion Less than \$1 million

\$100 million – \$999 million Don't know

\$10 million – \$99.9 million

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Next Month

Zip Objects, Zap Wait Time

As the capabilities of our distributed applications increased, so did our consumption of bandwidth. We were presented with a problem faced by many developers of distributed systems: how to reduce bandwidth and client wait time without removing any functionality. This article will share our solution to this problem and provide you with the simple code that helped us eliminate over 80% of our network traffic.

The Location API

The Location API (JSR 179) was accepted by the Executive Committee for Micro Edition of the Java Community Process in June 2003. It provides an abstract interface for access to location-based information, such as the current coordinates of the mobile terminal independent from the underlying positioning method used. This article outlines the current mobile positioning methods, introduces you to the Location API, and concludes with the presentation of a recent location-based service.

Multiple Inheritance in Java

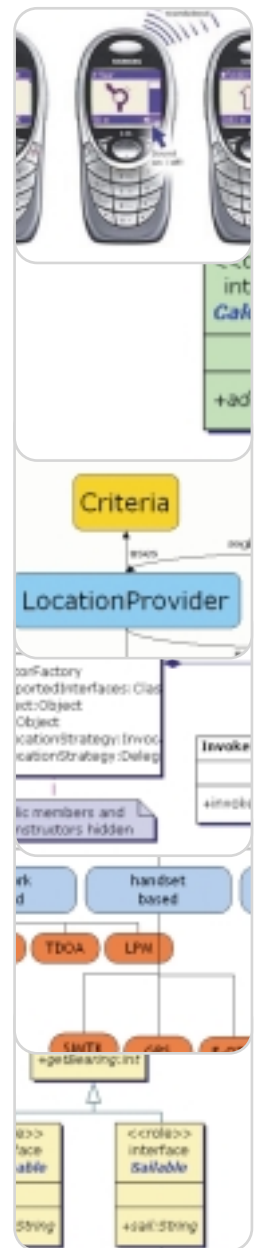
When Sun were designing Java, they omitted multiple inheritance – or more precisely multiple implementation inheritance – on purpose. Yet multiple inheritance can be useful, particularly when the potential ancestors of a class have orthogonal concerns. This article presents a utility class that not only allows multiple inheritance to be simulated, but also has other far-reaching applications.

Java Games Development

In Part 3 of this three-part series, the discussion focuses on using .NET versus Java for games development and whether that's even a valid comparison, and the benefits and drawbacks of developing games in Java 3D.

Teamstudio Analyzer for Java

For decades, premier software vendors realized that uniformity in projects cannot be assured without additional inspections during development. Teamstudio is one of these world famous software vendors. The company has made a name for itself with its software tools for Lotus Notes and Domino, but now also develops software tools for Java. Teamstudio Analyzer for Java is a tool that automatically inspects your code and enables control over uniform coding style within your projects.



Collective Community or Corporate Censorship?

Sun made a lot of noise at this year's JavaOne when they launched their java.net online community. Not quite sure why they did this given the fact that there are a number of good sites that already fulfill this role, although if I were being cynical I'd say it was a thinly disguised marketing effort to capture visitors from these sites to one controlled by Sun. To dispel such paranoia, Sun announced that O'Reilly would manage the site's contents. Tim O'Reilly is well known for his excellent series of technical books and his strong advocacy of open source.

What Then Are We to Make of the Case of Mr. Gerald Bauer?

Mr. Bauer is project lead of Luxor XUL, a regular contributor to javalobby.org, and also a driving force behind "Operation Java Freedom" – <http://viva.sourceforge.net/> – a portal to various Java open source projects.

In writing up a summary of a javadesktop.org article about JDNC, he made what I would categorize as irresponsible remarks that made fun of its author based on her gender. The target of these jokes, Amy Fowler, is a very accomplished engineer at Sun who has an outstanding reputation in the technical community, and no newsgroup posting should ever make

reference to the gender of an individual any more than it should discuss their color or age. Humor on a newsgroup is no excuse for being unprofessional.

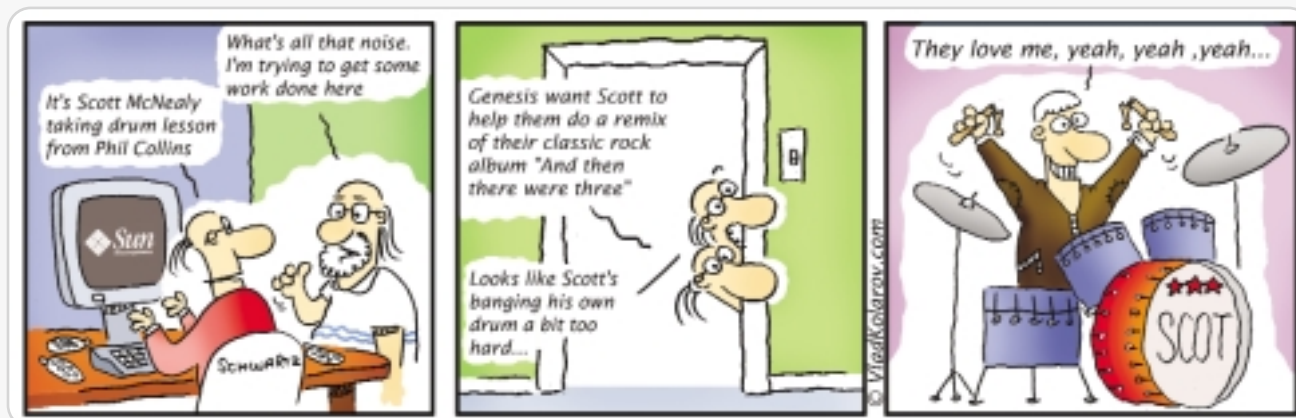
Whether the remarks were made in bad taste or not you can judge for yourself, <http://article.gmane.org/gmane.comp.lang.xul.announce/29>, but they caused Mr. Bauer to be thrown off javadesktop.org and also become the recipient of an apparent campaign to silence and eject him from other newsgroups, e.g., www.sys-con.com/java/articlenews.cfm?id=2138 and www.javalobby.org/thread.jsp?forum=61&thread=8533.

The offending comments were never made on javadesktop.org; his article was referenced in a thread discussing JDNC, www.javadesktop.org/forums/thread.jspa?threadID=34. Instead of engaging feedback based on the content of the article, Mr. Bauer was almost instantly labeled rude and sexist by the newsgroup moderator. The irony is that while he may stand accused of being sexist, albeit as an ignorant offender, this is nothing compared to the Sun marketing campaign that uses Christina Aguilera to promote Java, <http://java.com/en/explore/mobile/christina.jsp>. This site talks about finding out what Ms. Aguilera is

wearing, what she's up to in her love life, and has links to rumor mill Web sites. This is surely hypocrisy for Sun to use Ms. Aguilera to market Java in a way that is blatantly sexist and belittles her musical accomplishments, while attempting to take the moral high ground against Mr. Bauer's jokes.

Having had his ID revoked, Mr. Bauer is now prevented from participating in other discussion threads. On one of these threads about Java and open source (www.javadesktop.org/forums/thread.jspa?threadID=205) all efforts to be included were thwarted by the moderator who repeatedly deleted posts he believed came from Gerald.

With an almost perverse joy, the moderator substituted Gerald's original posts on the open source thread with comments like [removing post from another Gerald Bauer account – thats <sic> 10 banned accounts for those keeping score at home]. For the record Mr./Ms. moderator – I am not keeping score, you are. I am voting with my feet and will no longer visit a site that operates personal vendettas and petty censorship against its members. That's the power of the Web – freedom to choose – and I hope for everyone's sake that Sun's java.net efforts are more successful at retaining their Web site visitors. ☺



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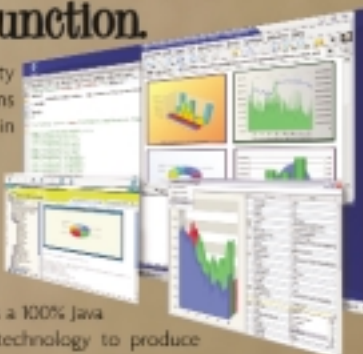
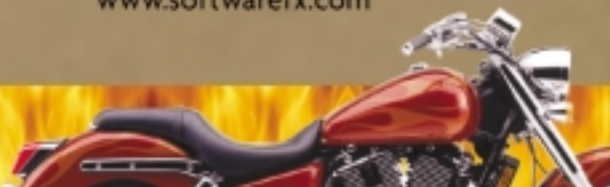


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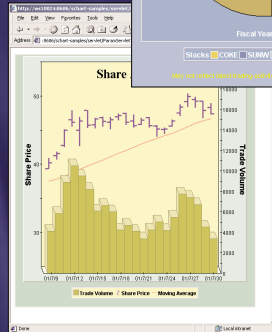
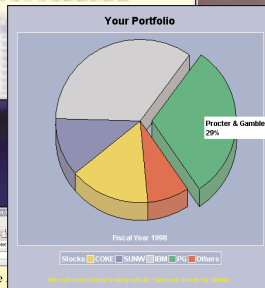
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