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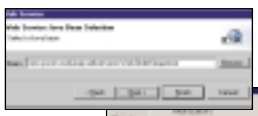

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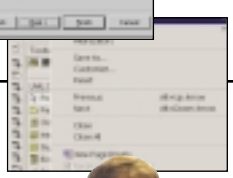

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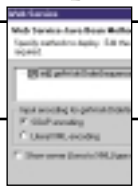

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An Ethical Win

BY JACK **MARTIN**

It's been a month of good news for IBM, which has been ranked the Top Corporate Citizen of the year, taken the lead in the application server market, and set some impressive records.

In our society, winning and ethics seem to be completely at odds. You only need to look at how professional sports and even the Olympics have degenerated into one cheating scandal after another. Then there are the Enron-like headlines that run everyday in the business press. It has become commonplace for companies like Global Crossing, which has been accused of manipulating its accounting books, to claim the company was safely in the black while actually hemorrhaging heavily. Arthur Andersen played a leading role in both the Enron and Global Crossing scandals as their auditing accountant of record as well as the supplier of management consulting services. The whole point of an accountant auditing a company's books is to ensure that it's not fabricating its claims. Shame on you, Arthur Andersen.

After hearing all of this I asked myself, how does IBM win in the marketplace while winning an ethics award? The answer I came up with is best-of-breed technology, strong partnerships, and evenhanded dealings.

The Business Ethics Corporate Social Responsibility study noted that IBM specifically received the highest score for its policies and programs for minorities and women. The ranking singled out IBM for its extraordinary employee and supplier practices, manager incentives for hiring and promoting women and minorities, diversity council work, child-care assistance, loans, and technical assistance to minority suppliers.

Through their work in K–12 education reform, a component of a $127-million global corporate philanthropy program, IBM has the unique distinction of having the success of its Re-inventing Education Program documented by an expert third party. The $75-million, one-of-a-kind education program has raised student achievement and is serving approximately 65,000 teachers and 6 million children around the world.

"Model corporate citizenship and ethics boil down to leadership, superior management, and quality people," said Randy MacDonald, IBM's senior vice president of human resources. "This honor is a direct reflection on the people of IBM and the value they deliver to all of our stakeholders every day."

Then, with regard to the marketplace, IBM announced that WebSphere grew 53 percent for the year, the 12th consecutive quarter of double-digit growth, has taken the lead in the application server space, and set new ECperf Benchmark records with WebSphere and DB2.

Looking at IBM's most recent ECperf submission, the WebSphere infrastructure and DB2 achieved an equivalent performance at only 72% of the cost of BEA WebLogic's latest submission on an Oracle database, delivering 16,634.40 Benchmark Business Operations per minute (BBops/min). The price/performance metric of $13/BBops/min is a measurement of total cost of ownership.

WebSphere has broken the record for performance for Standard Performance Evaluation Corp. (SPEC) benchmarks. These numbers include the overall industry-leading number for the client-side benchmark SPECjvm98 and the leading numbers for Windows systems running the server-side benchmark SPECjbb2000 – both for the IBM J2RE 1.3.1 – establishing IBM's industry leadership in Java performance.

As Scott Hebner, director of marketing, IBM WebSphere, said, "Once again, we continue to prove that a combination of WebSphere and DB2 delivers the industry's best value, lowest total cost of ownership with industry-leading performance. Not only does WebSphere enable customers to cut the overall cost of running applications, but we do so while delivering superior performance."

A professional alignment with the IBM team is an ethical and winning move that we can make right now.

ABOUT THE AUTHOR... Jack Martin, editor-in-chief of ***WebSphere Developer's Journal***, is cofounder and CEO of Simplex Knowledge Company, an Internet software boutique specializing in WebSphere development. Simplex developed the first remote video transmission system designed specifically for childcare centers, which received worldwide media attention, and the world's first diagnostic-quality ultrasound broadcast system. **E-MAIL...** jack@sys-con.com

Different tools for different folks

Developing Web Services with WebSphere Studio

BY RON **BEN-NATAN**

ABOUT THE AUTHOR

Ron Ben-Natan, CTO of ViryaNet Inc., holds a PhD in computer science in the field of distributed computing and has been architecting and developing distributed applications for over 15 years. Ron's hobby is writing about how technology is used to solve real problems, and he has authored numerous books, including *IBM WebSphere Application Server: The Complete Reference*, published by Osborne/McGraw-Hill.

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So you've heard all about how great Web services are and how they are revolutionizing the way distributed systems are being developed. You've read all about how this new set of standards is changing the Enterprise Application Integration (EAI) space and how it's finally making interoperability possible. You've even heard that it's possible to make calls on code written in C# and deployed using ASP.NET and have read an article or two about SOAP, WSDL, and UDDI. It's time to take the next step.

This month I thought it fitting to cater to those of you ready to take the plunge and try your hand at developing a Web service or a Web service client. Incidentally, if you still haven't done all the recommended reading, don't sweat it – you really don't have to know too much when using WebSphere Studio. Also, this article will try to bring you up to speed, but just a bit though – wouldn't want to bore the folks who've already read it all.

If you're reading this magazine, chances are you're using the IBM WebSphere family of products. This means you're using the WebSphere Application Server as your deployment environment and some combination of WebSphere Studio and/or VisualAge for Java as your development environment. Web services are fairly new on the technology map and thus also on the WebSphere product roadmap. Web services were first supported by the Web Services Toolkit, which was introduced on alphaWorks. More importantly, as of version 4, Web services are directly supported by the WebSphere Application Server (WAS) as well as the WebSphere Studio development tools. This two-part article explains how to create and use Web services using the new WebSphere Studio product line, specifically using WebSphere Studio Application Developer (WSAD).

This month I'll focus on the use of WSAD to develop and publish a Web service. You'll see how to use the Web services wizard to wrap an existing Java method as a Web service and expose the metadata required for invoking the service. You'll then see how to use another tool – the UDDI Explorer – to publish your service on a public registry so others can find and use it. Next month I'll focus on building a client that invokes the Web service and on running a sample test application.

The WebSphere Studio Product Family

Starting with version 4, a new set of development tools has been introduced as part of the WebSphere Studio product family. IBM now offers two new tools – WebSphere Studio Site Developer (WSSD) and WebSphere Studio Application Developer (WSAD). Those of you who have been using WebSphere Studio in one of its previous incarnations or who have been using VisualAge for Java will be pleasantly surprised. Both of these new tools are much better in terms of the developer's experience and in terms of the tools available to save time.

WSSD targets Web developers who are focused more on the Web application than on underlying server code. WSAD is a more complete environment that supports Web developers but provides more focus on J2EE developers. Both environments allow you to develop Java code and both tools support the development of Web services in a similar way, but if you are a hardcore developer, chances are that you will be using WSAD. In any case, both tools share a common development metaphor and both support the development of Web services in a similar way. The examples in this article use WSAD, but they are also relevant to those of you who prefer using WSSD (which is overall a simpler tool to use).

Application Developer (as well as Site Developer) is based on the concept of a developer role and implements a set of *perspectives*. A perspective is an organization of the workbench that focuses on a developer role and presents the "best-practice" layout of the tools most often used in that developer role. For example, the Web perspective focuses on the set of tools for editing JSPs, scripts, servlets, etc. The Server perspective includes the server configuration pane for the WebSphere test environment, the test environment

console, and a set of tools used for configuring the test environment. You can open many perspectives and easily switch between them when you go through the code-test-debug-package cycle.

You use WSAD for all development tasks. Whether you mostly develop JSP, EJB, core Java code, or Web services, WSAD is the tool you consistently use. One of the implications is that VisualAge for Java is being phased out and WSAD is replacing it. Don't be sad – WSAD is superior in every aspect and you'll find it very easy to use. IBM has done a nice job in packaging all these tools together in a way that makes it powerful and usable at the same time. (Just for the record – I don't work for IBM and [unfortunately for me] I'm not getting paid by IBM to say these things.)

Web Services and WSAD

Without going into any of the (very interesting) details, a Web service is a method that is deployed on an application server and invoked over the Web. Web services are usually used by other applications and systems and are becoming the preferred way to integrate and interoperate in environments that involve decoupled, distributed applications.

What makes a method deployed on an application server a Web service is not the "what" but the "how." A Web service invocation is done using the Simple Object Access Protocol (SOAP). SOAP is an XML-based protocol that packages the arguments needed to invoke the service along with the invocation details, routing details, and more. The SOAP message usually travels over HTTP, but other underlying protocols may also be used. SOAP is a de facto standard. It is backed by the entire software industry, including IBM and Microsoft. This is what makes Web services so special and so powerful. It means that there is finally an agreed-upon way to communicate between different platforms; let's just hope it stays this way and that no one thinks of "extending" it (after having "embraced" it).

There are two more standards involved with Web services – the Web Services Description Language (WSDL) and Universal Description, Discovery, and Integration (UDDI). WSDL defines how to describe a Web service. After all, if you develop a service for others to use you need to be able to tell them how to invoke the service. WSDL documents the metadata with which a client application learns how to invoke the ser-vice and describes things such as where the service is deployed, what arguments to pass in, and what the return value will look like. Once you have this document you need to publish your service to a UDDI registry using the UDDI APIs available from such registries. Sometime later, client applications make UDDI calls to search for a service based on some criteria, discover your service, get the WSDL description, and start using your service.

SOAP, WSDL, and the UDDI APIs are standards and are therefore well-documented. They are all based on XML and it's therefore possible for a human to read and write such documents. You can (theoretically) write SOAP messages and WSDL descriptions using your favorite text editor.

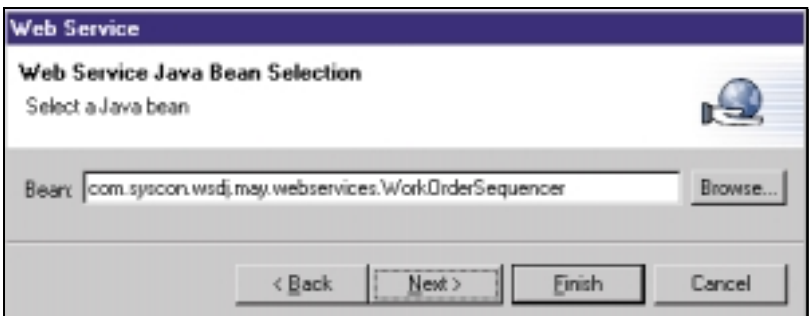

FIG. 1: SPECIFYING THE IMPLEMENTATION CLASS TO WRAP AS A WEB SERVICE

If you've had much experience with XML you already know that XML documents tend to be verbose. Because SOAP, WSDL, and UDDI offer comprehensive support for distributed invocations, these XML documents tend to quite quickly become complex and difficult to write. Therefore, you should not be writing these XML documents yourself. Instead, you should be using tools – specifically WSAD.

WSAD hides the complexity of the mechanics of Web services behind a set of tools and wizards. You can do all your Web services development quickly and efficiently without writing a single line of XML. You can also publish Web services on a registry using a WSAD tool. It's time to move on and see some of the magic.

Developing the Web Service

Assume you're building a Web service that uses advanced optimization algorithms to create efficient driving patterns. People who need to visit a set of locations during a work day access your service and tell you where they need to go. You in turn have a smart routing and optimization engine and access to historical traffic patterns with which you can suggest an optimal sequence that the person should visit in order to minimize driving time. Your service can be used by applications used by delivery drivers, service technicians, claims adjustors, and more.

Assume that you already have the Java code that performs this optimization (maybe you already implemented this for your company and now want to create a new revenue stream by selling the service to other companies). In order to simplify things, assume you have a class called WorkOrderSequencer that has a method with the following signature:

```
public int[]
getWorkOrderSequenceForEmplo
yee(long[] lats, long[]
longs)
```

As input you receive two arrays with the latitude and longitude coor-

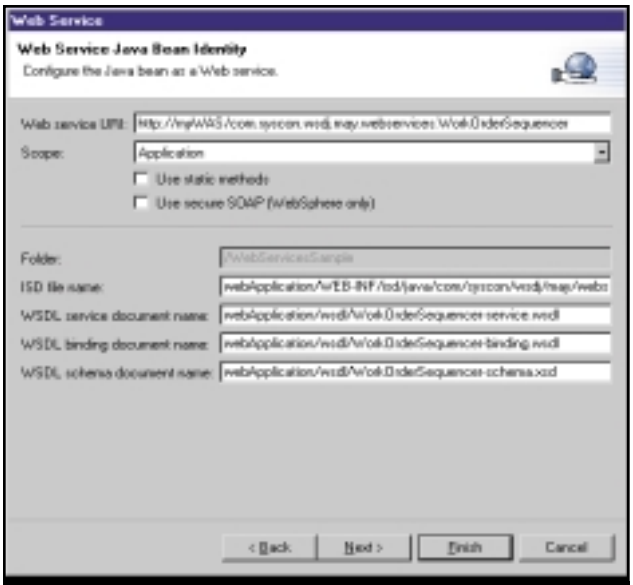

FIG. 2: SPECIFYING WHERE THE WEB SERVICE IS LOCATED AND THE WSDL DETAILS

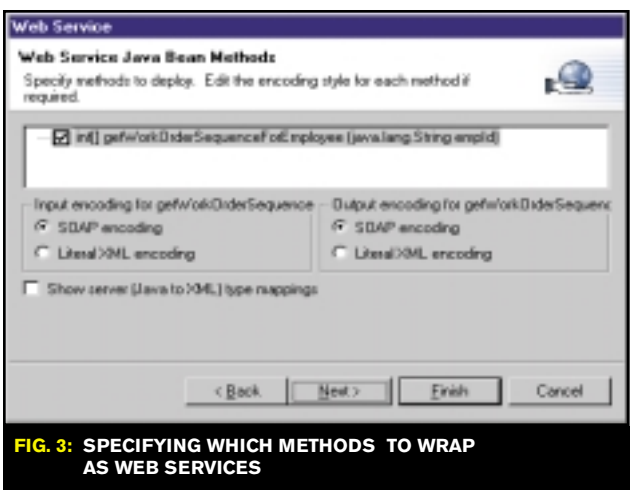

FIG. 3: SPECIFYING WHICH METHODS TO WRAP AS WEB SERVICES

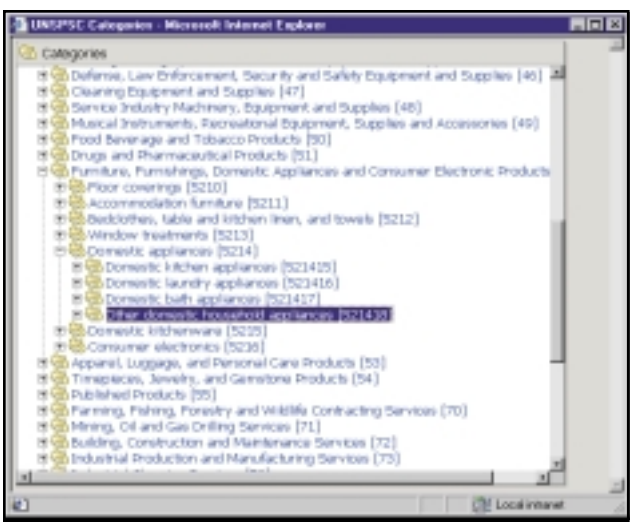

FIG. 4: USING THE UDDI EXPLORER TO SELECT A UNSPC-BASED CLASSIFICATION

dinates for the places that the employee needs to visit. Your reply is an array with the sequence order. For example, if you are passed 10 locations, you may return an array of the form {4,6,2,3,1,8,9,7,0,5} meaning that the person should first visit the location with the fourth latitude/longitude, then the location with the sixth latitude/longitude, and so on.

Having the method implemented is just the beginning – what you really want to do is develop the Web service – the wrapper through which your method can be called from another system. You use WSAD's Web services wizard in order to do that. The wizard guides you through a set of simple steps and at the end "wraps" your method with a Web service and generates all the files needed for you to deploy the Web service (along with the implementing code) on a WebSphere Application Server. Obviously, the WAS instance needs to be enabled for Web services – as is WAS version 4.

As an example, Figure 1 shows the wizard panel in which you specify which class to wrap, Figure 2 shows the wizard panel in which you specify where the service is located and where the metadata and WSDL files should be stored, and Figure 3 shows the wizard panel in which you select which methods to wrap as Web services and what type of XML encoding should be used for marshaling arguments.

When you complete filling in all your preferences, the wizard goes to work. It generates all the needed metadata files for the SOAP invocation to be handled correctly. It also generates all that is required for making a Web service invocation – but that's part of next month's column.

Let's look at the metadata that the tool generates on your behalf, i.e., all the hard work it saves you. The first thing that the wizard generates is an XML Schema Definition (XSD). The XSD describes the types used within the Web service. Listing 1 shows the XSD generated based on the method's signature. It defines complex types for an array of int and an array of long as extensions to the SOAP array type.

Next is the service description defined by the WorkOrderSequencerService.wsdl shown in Listing 2 (some of the details are omitted for the sake of brevity). This WSDL file defines the location of the service using a SOAP address that's embedded in a port definition. The SOAP address – the most important element – specifies how client applications invoke the service. The address always points to a fixed servlet, the rpcrouter. This is part of the Web services infrastructure packaged within WAS version 4. This servlet receives requests and maps the service request to the implementing class – the class and method you are wrapping as a Web service.

The service WSDL file imports the binding WSDL file. The binding WSDL (shown in Listing 3) includes a definition for the remote interface, a definition for all possible messages (both requests and responses, because SOAP is inherently asynchronous), and the operation definitions along with the encoding properties. Clearly, I've glossed over the gory details because they could fill tens of pages. That's the beauty of WSAD – you don't need to know any gory details in order to develop Web services!

Publishing the Service

Once you finish developing a Web service you usually proceed to test it and debug it. Then you package your application as an EAR (that has a WAR) and install it on your WAS instance. Once you complete all these steps you have a Web service deployed on the Web. The only problem is that no one knows about it.

That's what registries are for. Specifically, UDDI registries allow you to publish your Web services for other applications to discover and use. They allow you to define a business (with a set of descriptive parameters) and the Web services provided by this business.

There are two kinds of UDDI registries – public and private registries. Private registries are registries that you implement yourself within an organizational boundary. For example, you might want to implement an

LISTING 1

```
<?xml version="1.0" encoding="UTF-8"?>
<schema attributeFormDefault="qualified"
        elementFormDefault="qualified" targetNamespace="…"
        xmlns="http://www.w3.org/2001/XMLSchema"
        …>
 …
  <complexType name="ArrayOfInt">
   <complexContent>
    <restriction base="soapenc:Array">
     <sequence/>
     <attribute
      ref="soapenc:arrayType"
      wsdl:arrayType="int[]"/>
    </restriction>
   </complexContent>
  </complexType>
  <complexType name="ArrayOfLong">
   <complexContent>
    <restriction base="soapenc:Array">
     <sequence/>
     <attribute
      ref="soapenc:arrayType"
      wsdl:arrayType="long[]"/>
    </restriction>
   </complexContent>
  </complexType>
</schema>
```

LISTING 2

```
<?xml version="1.0" encoding="UTF-8"?>
<definitions name="WorkOrderSequencerService" …>
  …
  <service name="WorkOrderSequencerService">
   <port
     name="WorkOrderSequencerPort"
     binding="binding:WorkOrderSequencerBinding">
    <soap:address
      location="http://myWAS/WebServicesSample/servlet/rpcrouter"/>
   </port>
  </service>
</definitions>
```

LISTING 3

```
<?xml version="1.0" encoding="UTF-8"?>
<definitions name="WorkOrderSequencerRemoteInterface" …>
  <import …/wsdl/WorkOrderSequencer-schema.xsd"/>
  <message name="getWorkOrderSequenceForEmployeeRequest">
   <part name="lats" type="xsd1:ArrayOfLong"/>
   <part name="longs" type="xsd1:ArrayOfLong"/>
  </message>
  <message name="getWorkOrderSequenceForEmployeeResponse">
   <part name="result" type="xsd1:ArrayOfInt"/>
  </message>
  <portType name="WorkOrderSequencerJavaPortType">
   <operation name="getWorkOrderSequenceForEmployee">
    <input name="getWorkOrderSequenceForEmployeeRequest"
        message="tns:getWorkOrderSequenceForEmployeeRequest"/>
    <output name="getWorkOrderSequenceForEmployeeResponse"
        message="tns:getWorkOrderSequenceForEmployeeResponse"/>
   </operation>
  </portType>
  <binding name="WorkOrderSequencerBinding" type="…">
   <soap:binding
     style="rpc"
     transport="http://schemas.xmlsoap.org/soap/http"/>
   <operation name="getWorkOrderSequenceForEmployee">
    <soap:operation soapAction="" style="rpc"/>
    <input name="getWorkOrderSequenceForEmployeeRequest">
     <soap:body use="encoded" …/>
    </input>
    <output name="getWorkOrderSequenceForEmployeeResponse">
     <soap:body use="encoded" …/>
    </output>
   </operation>
  </binding>
</definitions>
```

interdepartmental registry as part of your enterprise architecture. Such registries aren't normally open to the general public. Public registries, on the other hand, are open for anyone to use. As an example, IBM implements a public registry called the IBM UDDI Business Test Registry. You can register as a user at https://www-3.ibm.com/services/uddi/testregistry/protect/registry.html, after which you can publish and discover services using this public registry.

UDDI registries are accessed using a set of Web services (what else?). In order to publish a service on a UDDI registry, you issue a SOAP message using one of the UDDI APIs. Once more, WSAD saves you the hassle by providing a tool – the UDDI Explorer. This tool allows you to define all of the properties and then creates the SOAP messages on your behalf.

The UDDI Explorer is used to publish your business and Web services and also used to discover services – but you'll have to wait until next month to learn about that. When publishing your business you specify its name, phone number, e-mail address, and other contact information. You also classify your business using the United Nations Standard Products and Services Classification (UNSPSC), the North American Industrial Classification System (NAICS), or a geographic classification (e.g., country and state). These classification schemes help someone looking for a certain type of business to find you – similar to the way yellow pages are used. For example, Figure 4 shows some possible UNSPC categories you could choose from in order to classify your business.

After publishing your business, go ahead and publish the Web service. You can again classify the service using categories from any of the mentioned classification schemes. In addition to that you specify the URL for the WSDL file describing your Web service. A service consumer using the UDDI registry will find your service while doing a search for one of the categories and then will use the WSDL to learn where the service is deployed and how to invoke it.

Summary

Web services are among the newest, greatest (and certainly most hyped) technologies to hit the e-business landscape recently. It isn't surprising therefore that the latest versions of both WAS and WebSphere Studio provide support for Web services. This month's article described the support provided by WebSphere Studio Application Developer for developing and publishing Web services. This is only half of the story – WSAD also supports discovering Web services and building client applications that make use of these services, which is the topic of next month's installment.

VOICE SELF-SERVICE APPLICATIONS ON J2EE TO THE RESCUE

BY DAVID **SIMMONS**

THE SOLUTIONS COMPANIES NEED TO INTERACT WITH THEIR CUSTOMERS

While most companies today are under tremendous pressure to anticipate and respond to customer demands in order to stay ahead of the competition, many are meeting this challenge over the Web with enterprise applications deployed on application servers. Increasingly, businesses are being challenged to deliver consistent and immediate services across multiple communication channels to customers who are on the move and whose needs are constantly evolving. To meet this challenge, companies must offer multiple access points to customers – and employees, suppliers, and business partners – in order to provide superior service and win customer loyalty. Web-accessible enterprise applications are a key part of this strategy. Accordingly, there is a huge need for companies to integrate voice-enabled services into many of their Web-accessible enterprise applications. Building separate systems for the various delivery channels is cost-prohibitive and doesn't adequately address the business needs of most companies. The integration of voice into Web services through the existing application server allows the creation of integrated Web and voice self-service, a new capability offering major benefits for cost containment, revenue enhancement, and customer satisfaction. Voice-enabled enterprise applications can productively and cost-effectively:

- Automate complex business processes and repetitive transactions and services.
- Extend customer reach by giving everyone with a phone, wireless, or wire line 24x7 access to enterprise applications.
- Improve contact center resource allocation and utilization by migrating agent tasks to transactional applications using a conversational interface to existing applications.
- Deploy multilanguage support of business processes by enabling callers to speak in their native language.
- Broadcast alerts, notifications, and reminders of events, meetings, product shipments, account status, etc.
- Converge phone-based voice transactions with Web-based transactions using existing technology, infrastructure, and business logic.

Voice self-service enables companies to meet the requirements of today's "never-satisfied" customers by providing anytime, anywhere access to enterprise information such as order management systems, bill and payment services, inventory and scheduling, customer service, and account management. Compared to menu-driven touchtone systems, customers and employees can expediently and intuitively manage transactions on their own over the telephone by resonding to system prompts. It promotes personalized customer service – including targeted up-selling, cross-selling, and discounts and promotional offers – based on customer profiles created through spoken input.

Fueling the growth of voice self-service in the enterprise is the realization that even with the Internet and Web-based services, the telephone is still the primary way for customers and employees to contact a company. While the number of Internet subscribers continues to rise, projected increases in the number of mobile phone users will only add to the call volumes that corporate contact centers can expect in the future. For example, Gartner Group estimates a 30% increase in calls to contact centers by 2003, when 45% of contact centers will utilize automated voice recognition-based user interfaces.

With the role of voice self-service in the enterprise destined to grow, voice infrastructure software vendors are providing Web/Java developers with powerful VoiceXML and J2EE tools for designing and deploying next generation voice-enabled enterprise applications. These services, deployed on top of existing application server infrastructures, extend a company's reach from the existing Web-based user to the traditional telephone user. They also allow companies to leverage their investment in traditional Java developers to provide these services without hiring additional, specially trained, voice-centric or call-center developers.

ABOUT THE AUTHOR

David Simmons is senior manager of Java Voice Technology for General Magic, Inc. He oversees developer programs for the flagship magicTalk Enterprise Platform, a suite of J2EE- and VoiceXML-based software that enables enterprises to develop and deploy next-generation customer self-service voice applications over the telephone. Integrating VoiceXML, J2EE, speech recognition, and telephony technologies, the magicTalk Enterprise Platform enables Java developers to create integrated Web and voice services that give voice access to enterprise information and services.

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Self-Service Infrastructure in the Enterprise

Many corporations invested heavily in Web technology because of its promise to improve operating efficiencies, contain costs, and increase revenues. Today, companies are sitting on top of an enterprise application infrastructure including databases, application servers, and application software, all designed to drive one presentation layer – the Web.

What if this infrastructure could be extended to drive services across the communication channel that's responsible for the vast majority of customer contacts – the telephone?

Voice infrastructure software closes the gap between the phone and the Web, as shown in Figure 1, by providing a platform to develop, test, deploy, and manage voice applications that implement a voice user interface (VUI) to a company's existing Web-based applications and enterprise systems. The application server thus becomes both a broker of Web-based transactions and an interface for the high volume telephone customer.

Voice Infrastructure Software and J2EE

State-of-the-art voice infrastructure software architected on J2EE (see Figure 2) and deployed on existing application servers like IBM WebSphere speeds and simplifies all phases of voice application development, integration, and deployment. Businesses can extend their existing technologies and enterprise services with voice services that leverage:

- A J2EE-based services framework for back-end system integration
- Business logic and data across applications, eliminating the need to re-create or store processes for mobile or voice services
- Existing application server investments
- Existing enterprise/Web/Java developer skill sets

A complete voice infrastructure platform allows easy integration of voice with J2EE-based e-business applications and enterprise software. It provides a developer workbench comprising essential voice application development tools:

- ***VoiceXML development tool:*** For point-and-click authoring of VoiceXML applications
- ***Reusable, extensible Java dialog components:*** For creating voice user interfaces
- ***Application server–based repository:*** For storing and retrieving voice assets such as prerecorded prompts, pretested grammars, and VoiceXML and JSP scripts
- ***J2EE interfaces:*** For interfacing and communicating with the existing application infrastructure
- ***VoiceXML debugger:*** For accurate line-by-line debugging of VoiceXML scripts
- ***Virtual telephony client with headset PC microphone and speakers:*** For rapid testing and debugging of VoiceXML scripts in a desktop PC environment
- ***Event tracker and rules engine:*** For voice user interface personalization and dialog stream analysis

Once development and testing of a VoiceXML application is completed, the voice asset repository enables rapid deployment to WebSphere and supports integration with enterprise content management systems such as Interwoven.

For deployment, a voice gateway is needed to enable telephone access to enterprise applications. This gateway consists of a VoiceXML interpreter that allows the integration of speech recognition, text-to-speech, and telephony technologies in an application. The VoiceXML Interpreter interprets and executes the VoiceXML dialog flow of the application by playing, appending, and concatenating the appropriate recorded prompts and relevant text-to-speech content. In addition, the VoiceXML Interpreter processes user requests for information and services by capturing the user utterances and requesting and processing speech recognition results. For all of this to integrate seamlessly, the voice gateway must be able to communicate efficiently with the back-end services, specifically those already deployed on existing application servers.

In the deployment environment shown in Figure 3, businesses can deploy and manage innovative, dynamic, personalized, conversational voice applications that provide self-service over any telephone. Personalization of voice applications is supported by an event tracker

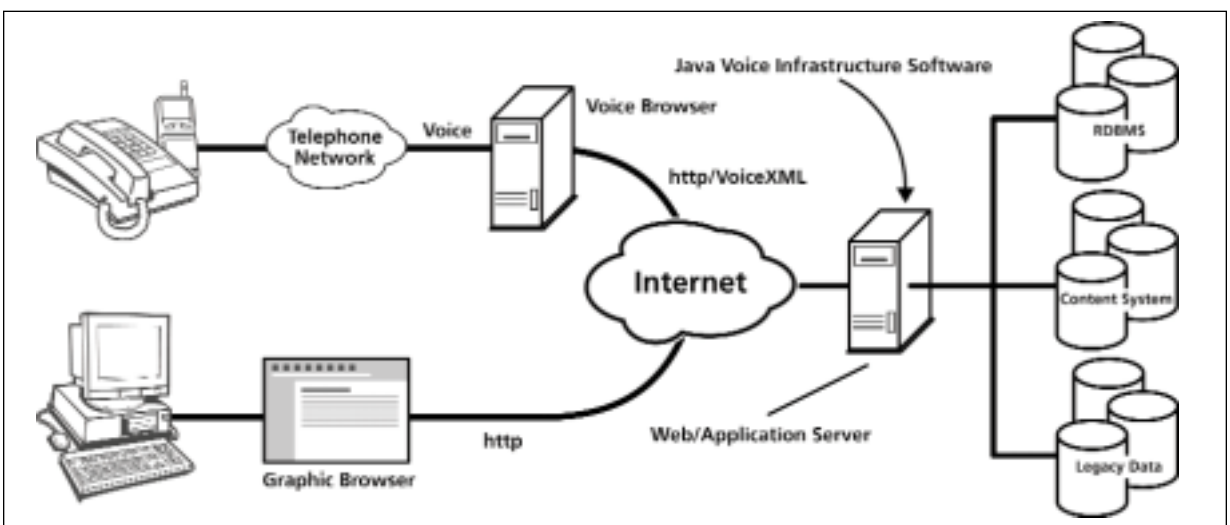

FIG. 1: INTEGRATED VOICE AND WEB-BASED SELF-SERVICE

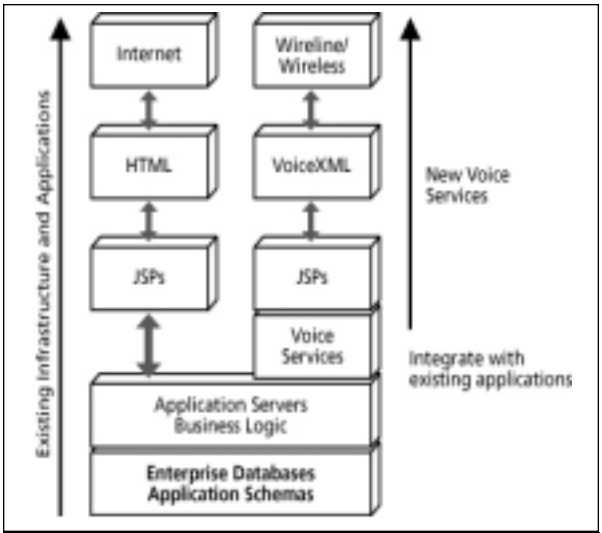

FIG. 2: ENTERPRISE VOICE SERVICES

loaded onto the application server at deployment, which gathers user statistics and utilizes them within a VUI rules engine to modify voice prompts and options delivered to a user. Remote deployments to distributed gateways and enterprise platforms can be coordinated from a central location, allowing multiple access points to the same application base over the Internet. Deployed in this manner, voice application communication can utilize existing Internet infrastructures without the overhead of Voice over IP or other more expensive solutions.

Java Dialog Components

Predefined Java dialog components simplify the development of natural conversational voice user interfaces. Each component represents a pretested unit of conversation for a commonly used dialog function, and is accompanied by a grammar and prompt library and a parameter set for extending and customizing the dialog function.

Dialog components can be extended and reused for new purposes. A parameter set facility enables unlimited extensibility of the dialog functions while maintaining consistency of the voice user interface.

Grammars and prompt assets associated with each dialog component are stored in the voice asset repository. They include:

- ***Prerecorded audio files:*** .WAV files that contain recorded prompts
- ***Prompt components:*** Scripted, reusable, customizable prompt components that provide quick and easy assembly of audio files
- ***Prompt pools:*** Collections of prompts that are randomized to allow the voice user interface to sound more natural
- ***Parameter sets:*** Predefined sets of parameters that tailor the component for a particular dialog function
- ***Grammars:*** Speech recognition grammars used as the rule base for recognizing words spoken by the user

Personality and application context–specific information can be associated with any prompt via metadata to enable the design of high-quality voice user interfaces.

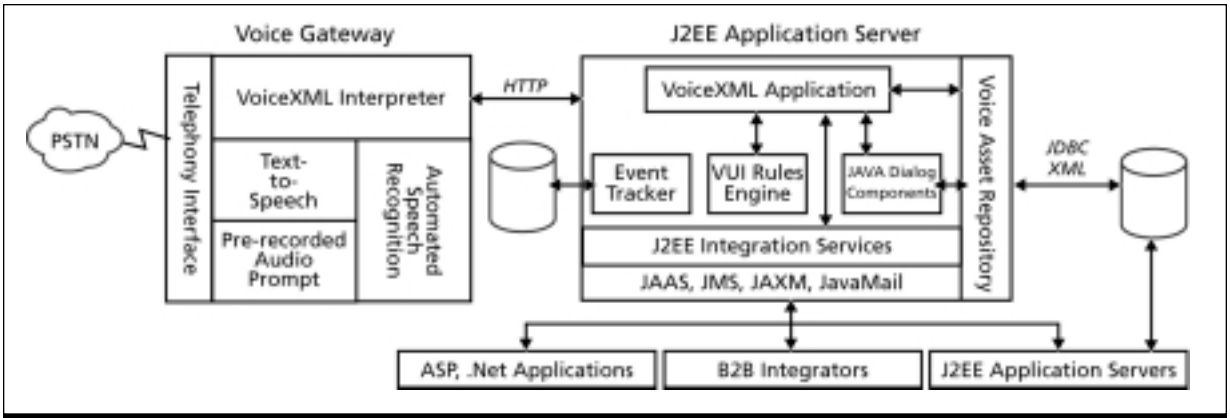

FIG. 3: DEPLOYMENT ENVIRONMENT FOR VOICE-ENABLED ENTERPRISE APPLICATIONS

An enterprise application running in an instance of WebSphere manages all of these assets.

Integration of Voice Applications

A state-of-the-art voice infrastructure allows easy integration of voice applications with J2EE-based e-business applications and enterprise software (see Figure 4). Voice applications can request services and send messages to other applications and legacy systems using standard Java Messaging APIs including:

- ***JMS:*** For performing point-to-point or publish/subscribe messaging with external resources
- ***JAXM:*** Communicating with external resources using Simple Object Access Protocol (SOAP) 1.1
- ***JavaMail:*** Accessing standard e-mail services
- ***JAAS:*** Authenticating and enforcing user-access controls

A well-designed J2EE voice infrastructure provides integration services that save considerable development time by enabling straightforward integration with back-end systems. This can be done through a set of dialog components called directly from the VoiceXML application that map to the J2EE services:

- ***Call component:*** Takes a message and sends it to the specified destination using either JMS or JAXM. The component can be invoked in both synchronous and asynchronous mode. In asynchronous, a VoiceXML script can be called each time a response is checked for, allowing the application to prompt the caller regarding the progress of the request.
- ***Send component:*** Takes a message or object and sends it to the specified JMS queue or topic. It can perform this action in synchronous or asynchronous mode. In asynchronous mode a script can be invoked each time a response is checked for. The response in this case would be a JMS message acknowledgment to the voice application.
- ***Login component:*** Accepts a numeric user ID and optional numeric PIN and passes the information via JAAS to a back-end validation mechanism.
- ***BrowseList component:*** Allows the user to navigate through a list of items and perform an action. Supports back-end integration with database items and e-mail via JavaMail.

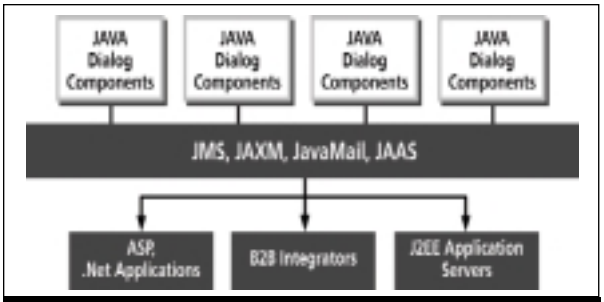

FIG. 4: J2EE INTEGRATION SERVICES SIMPLIFY VOICE INTEGRATION WITH BACK-END SYSTEMS

The J2EE integration services also include voice application service extensions and a messaging controller to enable interaction with the Java Messaging APIs, namely:

- ***Voice application service extensions:*** Custom tag libraries that allow server-side applications to incorporate the same messaging structure that is used in the dialog components. Tag libraries exist for building XML messages and interacting with JMS or JAXM.
- ***Messaging controller:*** Provides a mechanism for managing the multiple interactions that can be present within the messaging services. The Messaging Controller allows JMS messages to be set to wait for an acknowledgment and JAXM messages to wait for the call to complete.

Conclusion

A comprehensive set of VoiceXML and J2EE-based tools gives businesses the solution they need for adding voice services to their enterprise and gaining the benefits of conversational, personalized, voice self-service applications. These benefits include reduced customer service costs, expanded access to enterprise services by customers, consistent information and messaging across all communication channels, enhanced customer satisfaction and loyalty, and new revenue opportunities.

By providing these services through standard Java and J2EE interfaces, enterprises can leverage their existing investment in application server–based Web applications, as well as their investment in the Java and J2EE programming skills they have already acquired to develop those applications. Extending the reach of Web-based applications to the voice market is now an easily attainable, and cost-effective, goal for most WebSphere customers.

A Talk with Jocelyne Attal

VICE PRESIDENT FOR MARKETING FOR THE WEBSPHERE BRAND

Jack Martin, editor-in-chief of **WebSphere Developer's Journal**, *recently sat down to talk with Jocelyne A. Attal about IBM's plans for the future of WebSphere*

WSDJ: WHAT DO YOU DO AT IBM?

Jocelyne: I'm the vice president for marketing for the WebSphere brand. Which means a lot of things. I have a wonderful team that covers a very large scope of work for WebSphere. We work on strategy and design for the next version of WebSphere, making sure it has what customers and developers need and want. We are very focused on customer needs. Based on input from technical experts like Danny Sabbah (VP of Development), Don Ferguson (IBM Fellow), and others, we have some very original and innovative technology.

Strategy is very important because it's about designing what WebSphere will be next year and beyond. WebSphere has been successful because we base our strategy on customer needs and on what customers are going to buy, not what we at IBM have in mind. We manage the different products and offerings that are part of the WebSphere brand and try to find the right priorities and balance between the short term, and which technology and products we should implement for the future.

This doesn't always align with general marketing procedures, but it is the beginning of everything we do. We conduct a lot of research, a lot of focus groups, and we're very focused on customer needs and how partners and ISVs want to use the applications. We're very focused on delivering return on investment for customers by helping them lower the cost of development for ISVs and business partners.

We manage campaigns in geographies throughout the world and in the channels, both direct and indirect. Of course, we manage the way we are going to market, including integrated communication and marketing. We work with the central IBM organization and other divisions in the IBM software group – DB2, Tivoli, Lotus – to be sure that we're all connected and are giving WebSphere the best exposure in the marketplace.

We also work closely with the press and analyst teams to make sure that we have the best exposure and the best understanding in the marketplace. It's a very large scope of work for marketing.

Of course, I don't do this alone. I have an absolutely wonderful team. I would say my team is the best in the industry. We became market leaders in less than two years and these people have a lot of talent – in creativity, in understanding customer and partner needs, and also an absolutely great talent for execution.

WSDJ: ARE YOU READY TO DECLARE VICTORY ON BEA YET? THE RUMOR IS THAT SOME GROUPS THINK YOU MAY BE AHEAD.

JA: I think we've already passed BEA. Frankly, everybody knows that competition is important. If we want Java to be credible, we need to have competitors. It's good that BEA is there and it's great to pass them.

I'm working every day to make WebSphere the leader. I'm focused on getting value to the customers and I want to satisfy their needs and help them solve their issues. This is why I am involved in marketing for WebSphere. It's great to be first. If I want to be the leader, I need to stay focused on customers, not the competition.

WSDJ: When you focus on a customer, tell us what that process looks like to you?

JA: We conduct market research and look at the market trends by surveying thousands and thousands of customers by segments. Segments are studied by vertical industries and by size of the company, and also by the various types of decision-making: line of business, CIOs, architects, and IT specialists. We understand the important

issues for each one of them. To have a successful product, you have to keep the developer happy and gain the support of the line-of-business people.

It's important to understand customers' expectations. We don't have any technology problems; IBM has more patents than anybody can dream about. The way we use the different technology components and develop them to provide products is the most important thing.

WSDJ: HOW DOES YOUR TEAM OPERATE?

JA: I don't envision any marketing team sitting in their offices. My team is all over the place, talking to customers and understanding what is going to be the next big thing globally.

This is how we learned early on that integration is so important for customers. They told us that most of their IT spending was dedicated to integration. We found out by talking to focus groups and customers individually as well as business partners.

The two most important questions in today's business world are, "How do I reduce my costs and improve my effectiveness?" Every CIO in the world is focused on that. The second one is, "How do I integrate my business?" Everyone is implementing new applications and wants to integrate with existing applications and IT systems. You can be a big company or a small company, you have the same issues at a different scale. We understood early on that the WebSphere family should focus on business integration. We also discovered that the big Web hype was worth it.

WSDJ: HOW IS THAT?

JA: It made a lot of companies rich and then a lot of companies poor when their bubbles burst. But we learned that the benefit of the Internet is about understanding user experience. It's about knowing your customers, and with WebSphere Portal, using the Web to better understand them, and to personalize information and transactions.

Today when I talk to a CIO and CEO, I don't talk about the Web. I talk about, "How do I reduce your cost?", "How do I make your IT spending more effective?" WebSphere Version 5 will allow you to develop applications faster because you use an absolutely great tool workbench. It will allow you to do this by leveraging a lot of assets that you already have by applying the Web services vision from WebSphere. It's about re-using your assets and not having to redo everything to advance and streamline business technology.

The way you reduce costs is to take advantage of the best infrastructure services. Another way of really lowering the cost of business integration is by breaking down the walls between different silos in your enterprise. We're lowering the technical cost of integration compared to people like webMethods or TIBCO. IBM is developing products that are making that easier.

WSDJ: DO YOU HAVE A PERCENTAGE NUMBER THAT YOU CAN THROW AROUND?

JA: Well, our goal is for WebSphere to help customers cut the cost of integrating their business by half.

WSDJ: THAT'S SOFTWARE AND LABOR?

JA: That's software and labor, and we're driving down the cost of integration because everything we do is based on standards. That's the best guarantee for customers, who can extend their IT infrastructure without developing more new skills and spending more money.

Reducing cost is also a benefit of WebSphere Portal. Imagine you're creating a portal for your employees; it's the best way of integrating information at the level of "the glass." A portal allows you to personalize information, applications, and interaction for your employees, your business partners, and your customers.

Portals are the extreme level of integration. It's integration and interaction, and you are addressing all kinds of devices. When you have a portal you can talk to people when they're in their offices, when they're on the phone, when they're on their PDAs, whatever.

WSDJ: WEBSPHERE V5 IS DUE TO BE RELEASED SOON, WHAT DO YOU SEE AS THE NEW BENEFITS?

JA: What we are doing with version 5 is increasing the quality and level of service in an amazing way. And we are also delivering the reality of deploying Web services. Everybody talks about Web services but no one else is ready to deploy it. We are. We're the only one in the market. We blend integration inside this release of WebSphere to be able to create what we call a "built-to-integrate" application.

We use some terms for integration here at IBM. There is integration at the level of the "store," which is about unifying the data for optimized source transformation and analysis. It's a data statement.

What we call "integration-in-flight" is really a different type of integration, such as process integration, which is based on what we acquired with CrossWorlds. It also includes everything that you have for integration: the application server, information brokers, workflow, and also specific connectors and adapters.

Then we have "integration-in-hand," which is really the user experience delivered by WebSphere Portal and Commerce.

WSDJ: HOW ARE YOU RUNNING THIS PROGRAM?

JA: I want to stay on top of market standards and make sure that we are unique. We are here to win the race, and that race is won by serving customers. That's very clear. My standards are the customers' standards and they are telling me that if I win, they buy my product.

My team shoots for the stars, they don't shoot for, "Let's get a little better!" They say, "This is a great opportunity. We can change the playing field, the customers need more than an application server." That's what they set out to do.

Scott Hebner, director of marketing for WebSphere Infrastructure Products, talks about the four categories of value in the new release:

There are four categories of tremendous value that will be delivered in Websphere v5. One is a comprehensive "build-to-integrate platform" that will significantly improve our customers' time to market by building new integration-ready applications and leveraging existing software assets. It has a comprehensive J2EE 1.3 certified environment that is fully Web-services enabled. It will allow our customers to easily compose and choreograph the flows of applications that are integration ready and can be exposed as Web services that other companies or other developers can easily use.

The second category of value is a highly "integrated application development" environment that will drive superior developer productivity. We have optimized our application development tools – namely WebSphere Studio for WebSphere Development – and we've enabled a number of new technologies in WebSphere v5 that will allow you to build applications easier and adapt them to dynamic rules needs. So overall, with our focus on open-source technologies and Eclipse we've integrated the tools to such a degree that we'll be able to deliver superior developer productivity.

If you look at the actual functionality in the server – the dynamic rules needs; the composition and choreography of applications; internationalization framework; application profiling; dynamic EJB query; dynamic SQL – it's much easier to not only build applications but to adapt them. There's an element of superior developer productivity there.

Number three is "agility of deployment and administration." There is a significant improvement in the ease of use and approachability of administering and managing the servers. If you want to start off with a standalone deployment and then move to clustering, and then move to the edge of network services like offloading of content or transactional quality-of-services routing of content at the edge, it can be done through a single, common administration console. The customer installs once and can easily change the deployment capabilities based on what they need to do. It's a very agile, very productive deployment administration and management.

The fourth category is what we call "intelligent, end-to-end application optimization." This is about meeting the demands of dynamic e-business with industry-leading availability, security, and performance. We allow our customers to optimize the quality of service by easily configuring the servers to different topologies. Things like clustering and fail-over, caching, edge of network capabilities – content off-load, quality of service routing of transactions. We've allowed the customers to build the application, so they deploy it in an optimized way to take advantage of the network.

So the four key areas of value are: the built-to-integrate platform based on a comprehensive Web services J2EE architecture; the highly integrated application development capability with some innovative services like dynamic rules, internationalization, and dynamic EJB query with highly integrated tools; agile deployment administration – very flexible and easy tasks to administer and deploy the servers and adapt them as you want to change the configurations; and finally, the intelligent end-to-end optimization to optimize the quality of service and the reliability of performance and service.

Our execution will continue to be based on customer feedback. WebSphere is number one in customer satisfaction, and this is the top priority for us. Because if WebSphere is number one in customer satisfaction, the sales will take care of themselves.

WSDJ: WHERE DO YOU SEE WEBSPHERE 36 MONTHS FROM NOW?

JA: I think that every customer is focused on making better use of what they already have in order to spend less and be more effective. We at WebSphere are listening to that customer feedback. Which means that in the next phase of WebSphere, we may decide not to use some of the great technology that's available to us at IBM. We may decide to pursue more quality of service, more cost-effective software, rather than the latest stuff in the world. We have to listen to the customer.

WSDJ: SO THAT'S THE FOCUS?

JA: We want to show a customer that you can modernize your enterprise by doing new things without driving up the cost. I'm very focused on that. WebSphere also will be the best pervasive platform, operating on a full range of devices. It's incredible what we are doing with car makers and appliance makers, and how WebSphere will be part of your everyday life.

That's what we are working on. WebSphere will be the best infrastructure software, embedded in everything you use everyday. If you buy a can of soda, drive in your car, use your PDA, use your phone, or use your mainframe, the application that you are using will run on WebSphere.

When I began this job, I asked my team, "What are you dreaming about for WebSphere? We are going to build the best service infrastructure in the industry and we want that to be ubiquitous." That's what we will to continue to do.

WSDJ: NEXT YEAR YOU SEE QUALITY OF SERVICE, RETURN ON INVESTMENT, AND FURTHER REFINEMENT OF THAT CONCEPT – THE REALITY OF IT ACTUALLY HAPPENING IN THE REAL WORLD, NOT JUST MARKETING NOISE.

JA: WebSphere is better, more effective. Let us take your asset and expose it to the Web. How do we make that more effective?

WSDJ: THIS YEAR AND NEXT YOU'LL MAKE IT COST-EFFECTIVE AND IMPROVE IT. THEN THREE YEARS FROM NOW, WEBSPHERE IS GOING TO BE EVERYWHERE. DO YOU WANT TO PUT A SLICE IN THE MIDDLE?

JA: If you look at the middle, it's going to be about better implementation and deployment of Web services. It's about pervasive computing. Pervasive is not quite there yet. It's starting now and it's going to become very important.

WSDJ: WE LIKE TO TELL OUR READERS A LITTLE ABOUT THE PERSON BEHIND THE COMPANY. PLEASE TELL ME ABOUT YOURSELF.

JA: People here see me as a marketing person, but I'm also a wife, and mother of a 15-year-old daughter. I work hard here and I work hard at home. It's a lot of work raising my daughter and running a household.

I'm not a typical mom. Can you imagine a teenage girl having a mom in jeans, riding a Harley Davidson? My husband, who is also French, and I aren't into hobbies, we don't play golf, but we do go to France sometimes and love riding our motorcycles.

As for my education, I graduated with a degree in nuclear physics in France, and I also have a master's in business administration.

I have always been passionate about technology. It may look esoteric to some people, but it is moving all the time and I love it. I think that if I have to describe myself, I am in perpetual motion. I like change. I like high-speed things. That's why I'm here.

I'm just having a lot of fun here and am very passionate about what I'm doing. I'm learning a lot. I love working with teams, especially the team I have.

Birth of a Platform

Interview with Don Ferguson

The Father of WebSphere

PART THREE OF A THREE-PART SERIES

In the final part of our interview with Don Ferguson, Don talks about the future of WebSphere

WSDJ: WHAT IS YOUR VISION FOR THE FUTURE OF WEBSPHERE?

DF: Our current focus is on implementing Web services and simplifying their development. WSFL and tools support for visually and dynamically building new Web services. Business rules support customizing the behavior of existing Web services.

The next big things will be support for better, dynamic binding between a service requester and the multiple implementations that are available. The binding process will be able to consider "quality of service," "price," "reputation," and other extensions available that describe how the supplier implements the services and its operations. Finally, technology like WSFL and dynamic binding will drive the definition of a "business transaction" specification and service. This will support robust, long-running, and complex multi-party business transactions. This service will include support for compensation and information versioning.

The final element of Phase II is multiprotocol support. When people think of Web services they have a tendency to think of WSDL on top of SOAP on top of HTTP. Our model for Web services is effectively WSDL. We support multiple binding and formats for WSDL interactions. These include SOAP/HTTP, RMI/IIOP and distributed EJBs, and JMS/MQ. We expect other protocols and formats beneath the WSDL abstraction. This allows the programmers to think in terms of Web services, but have the middleware provide optimizations to improve performance and robustness.

WSDJ: PHASE III WILL BE?

DF:

1. Multiparty flow monitoring and runtime correction
2. Improved support for rules
3. Portable definitions of service flows
4. Business transactions
5. Runtime monitoring, service level agreements
6. Multiparty process support

Danny Sabbah once said something about our various business gateway products. He said, stop talking about gateways; there's no inside/outside. That assertion was confusing implementation with concept, but the concept is true. Enterprises will use the Web service model for application integration. This will initially occur within the enterprise, which is one reason we focus on optimized protocols in addition to HTTP. Enterprises will incrementally expand to using Web services for integrating their internal business processes with those of their partners. Thus, both internal and external applications will appear as Web services available on an integration service bus.

One element of the next big wave will be coalitions and partnerships agreeing on a set of business processes and hosting them in something resembling a utility model in the network. The individual corporations in the partnerships and coalitions plug into the hosted processes by wrapping their internal business process and applications with WSDL interfaces. When you think about what enterprises do with their IT technology, it's been a consistent attempt to make it easier for employees, partners, and customers to electronically interact with the systems and to develop new processes more rapidly.

The companies have gone through a set of phases: Phase I was: I fill out a paper form and mail it to you. This might be a purchase order, for example. You respond with mail.

Phase II is: I give you a little browser interface that allows you to fill out the form electronically and then submit it to me. You can also check on the status through the browser interface.

In a B2B scenario, someone sends an e-mail to a purchasing agent in his or her company, who turns around and uses a Web browser to submit the form to the supplier. This is one step in the purchasing process in the enterprise.

Well, why is it like that? Why do we need the Web browser interface? Well that's kind of nutty. Why don't they fill out the Web form on an application in their enterprise to produce a message that goes into their purchasing system and process? The process can directly send the request to the supplier's system. There is no reason to use a human, the purchasing agent, to perform the application integration step that links the two enterprises.

People have the tendency to use new age terms like "Virtual Enterprise" to describe Web services and B2B. For me, it is not that revolutionary. It's no different than what people are doing today. It doesn't change the way people do things; it just makes things faster. It goes from paper, to phone calls to Web pages to messaging.

In terms of enablement, Web services and standards allow people to make decisions about virtual partnerships in a much shorter period of time because it gets the infrastructure out of the way of execution. Once that happens that drives utilities in the market space.

WSDJ: GIVE US AN EXAMPLE OF "UTILITY."

DF: If you and I are exchanging messages, someone is going to have to audit them. Otherwise we'd end up in court. So there'd be an audit utility. When you and I bind together, part of what is in the binding extensions is information about who we agree is going to be the auditor. This is a simple example of a utility function in the network.

So logically, I'm talking to you, but physically, we're sending messages to a third party, who is putting them in a log, authenticating them, etc. The utilities may be hosting the flows (processes) to which we have agreed. If we have agreed on a short-duration business partnership, we cannot afford a delay in setting up an infrastructure to host our collaborative processes. So we will express the collaborative flows and their performance requirements in Web services standards (e.g. WSFL, Web services Service Level Agreements) and contract with a utility to host them. The in-network flows use Web services to drive our internal applications and business processes.

Today, people produce "content" and they put it on a network. In the B2B utility model, people define processes and get network utilities to host them.

To do these partnerships there may be a physical infrastructure side of things; we may need somebody to set up a warehouse for us and to set up an inventory management. Instead of doing that in-house, we'll go and contract with somebody to do it. Hosting the Web service definition of business processes is the electronic processing equivalent of contracting for physical infrastructure services.

From a business perspective, if an industrial engineer looked at this kind of thing, and he drew pictures, he'd see a component model. In our economy there is a trucking company, and people who make things. From an engineering point of view or a manufacturing point of view, it's a component model. With Web services, there's now a component model on the Internet that's getting near to the point where it can mirror the model of the economy. And because of that, it allows people to make changes in the way that they do business electronically – much more quickly and efficiently. I see the Internet and e-business, whatever the heck that means, becoming something that mirrors much more closely the physical mechanisms of business. It's a much better electronic representation of how things work physically and how they interact and combine to implement business solutions. I hear a lot of people whining about the economy, "Oh we're in a recession, blah, blah." The thing that determines the wealth of the society is productivity, because you can print all the money you want but you have to make more goods for a fixed expenditure of energy. I think we're on the verge of an electronic revolution of sorts in productivity. While there may be a slowdown now, we are on the verge of a potential burst of productivity improvements through Web services and the Internet.

The Internet is going to mirror the economy. It'll allow the economy to run much faster and more efficiently and it will have as much an impact on productivity as the industrial revolution did. Productivity is going to continue to go up.

It's almost a complete revolution of the way we've done things in the past, Information technology was hard and complicated, so people had to adjust their world model. They had to change the way they thought about the world, so it mapped the way computing works. With WSFL, Web services, portability, services in the network, utilities, it's actually changing. So they're thinking now, the IT infrastructure model is the way the economy works. They don't have to warp the way they do things to match it to IT – that's the big change.

People use wacky words for this sort of thing like "e-Utility" and "virtual enterprise," but it's just photons flowing faster, yet doing the same thing. Shipping is a utility; communication is a utility; warehouses are utilities. All that is happening now is there are electronic components that you can use to customize the way that you do IT. To map the way the world works instead of vice versa. That's without a doubt a big concept.

WSDJ: HOW DO YOU SEE WEBSPHERE PLAYING IN THE PERVASIVE MARKET, NOW AND IN THE NEXT 24 MONTHS?

DF: We're seeing an evolution. WebSphere Portal and WES have been very good products for delivering, for lack of a better term, Web pages to pervasive devices. When we think about pervasive devices a very common mode of usage is something like this – I'm going to fill out a form and then submit it. Something is going to happen on the server. For example, I'm going to fill out a form and I'm going to tell you the stocks I'm interested in and I'm going to submit it. It's going to send some kind of spooky message and I'm going to get a form back that will show me the values. Everyplace and Portal are products that will do that, which is information delivered via a Web browser on the pervasive devices.

That model works, but as pervasive devices get more complex, it's not a great model. So we're doing something, as are others, to develop what

ABOUT THE INTERVIEWERS

Jack Martin, editor-in-chief of ***WebSphere Developer's Journal***, is cofounder and CEO of Simplex Knowledge Company, an Internet software boutique specializing in WebSphere development. Simplex developed the first remote video transmission system designed specifically for childcare centers, which received worldwide media attention, and the world's first diagnostic-quality ultrasound broadcast system.

Patti Martin is cofounder of Simplex Knowledge Company, where she is vice president of Creative Services. She manages the company's Web servers and oversees Web content and creation. Patti received her education at the New School in New York City and has taken continuing education classes at NYU and the School of Visual Arts.

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we think of as a hybrid-client model. You can envision a world that is a little bit of WebSphere, a little bit of WebSphere Application Server, a little bit of DB2 Everyplace, and a very lightweight MQ footprint on the device. The applications run locally and they use Web services to interact with logic on the network. It's like a portal concept, only from the client side – my device becomes my portal. It will show me my stock prices instead of my filling out a Web form, sending it out and the Web site remembering what my stock portfolio is, and then me polling it periodically. The knowledge of what's in my portfolio is in two places. It's in my financial company, but it's also on my device.

WSDJ: WOULD THAT PUSH THE FUTURE TOWARD CE COMPARED TO PALM TECHNOLOGY?

DF: A Palm Pilot today has more processing power in main memory than the first IBM mainframe I used. I think you may be missing the extent to which what we think of as server-side middleware can scale down to for pervasive devices. We used to run CICS on mainframes that are almost as powerful as Palms are now. It doesn't mean we're going to do that in the future, because the device is not dedicated to transaction processing. We have to get the footprint down. You can produce packages of our middleware that are down in the 100s of KB in footprint. When you think of Palm devices with 8MB of memory, when we put a middleware footprint that totals 1MB, we're in business and we are there. So we think of it as a hybrid model. There's lots of information on your device. You're using Web services to interact with business logic that is on the network.

Instead of going up to a server for all information, you're saying, "please give me the page with all my Portlets in it," and my device renders it. The Portlets are going to run on the device and make the calls up, "please give me the information," and light up the display.

No one is shipping this now. The point that I'm making is that the "operating system" is not the issue. What we need is middleware on the devices because that's what the application developers see.

When you hear "middleware on the device" it sort of sounds like, "Well yeah, IBM is trying to drive more business." We're above petty mundane things like that. It's more about the fact that sites need to develop applications and functions that can run anywhere in the call chain: client, in-network content servers, edge server, etc. You want a common model for developing business functions. Some people are going to run that on WebSphere on 390 and some people might want to run that on an edge server in a provider network. Some people might want to run it in the Web front end and some people might want to run it on their client devices.

When you think about a portal, it's a mix of things. It's what the enterprise wants you to see, and it's what you want to see. Well, if I want to see something from this company, why do I go back to the enterprise and have them aggregate it? What I want to do is get my Portlets from the enterprise as well as "punch out" to other portals directly from my device workspace.

It's not so much middleware on the pervasive device that is the key thing. What's really important is having a common programming model that allows people to develop components that can run and deploy in multiple places in the end-to-end network. The client device is just one endpoint. Again, this sounds like spooky stuff, but we'll use common sense and there will be some stuff you'll never run on a mobile device or on a mainframe.

Pervasive devices are going to move from just browser pages that rely on data centralization and sending forms back and forth to actually being devices that run some of these Web services and use other ones on the network.

Supporting middleware and Web services on end-user devices enables two things that are critical to pervasive. One, it's much more efficient in terms of communication just to send the stock prices and information than to send the HTML pages that have the stock prices in them.

The second is, it supports what we think of as sporadically connected behavior. For example, I can manipulate information on my personal device, like my expense accounts, and then just ship them off and get the exceptions shipped back to me. This can occur during periods when I am connected to the network.

In essence we've always had this concept in WebSphere, of business logic as services independent of channel. People build a Web front end to channel independent logic. The presentation layer calls the business function through a command abstraction, "Run this command." Then people said, "Well if I have that clean a separation, I can move some of my display functions and JSPs out into edge servers in the DMZ." Then they can move them out into the edge server. Then they can move them out into the servers in a content distribution network. Now why don't I just go all the way and put them on the end device?

In essence, this is what we're seeing. Since we had that clean separation between business logic and presentation, people are taking the person-facing front end, the thing that's really personal, and putting it on the end device. Then, since you've got the command abstraction behavior for calling business logic, you can go use Web services and go asynchronous with the command model

That's where I see the pervasive world going.

"A Palm Pilot today has more processing power in main memory than the first IBM mainframe I used"

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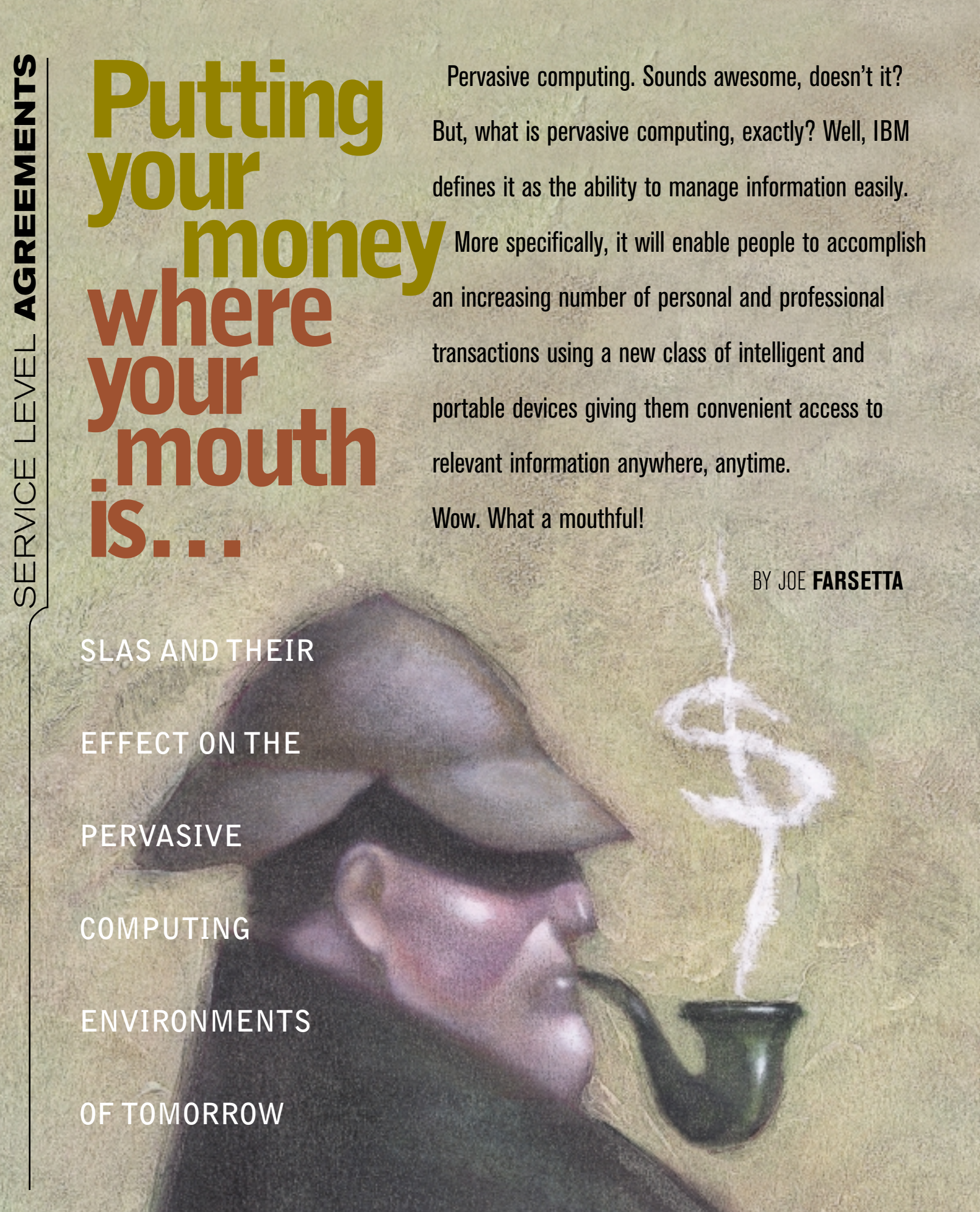
SLAs and their effect on the pervasive computing environments of tomorrow

Pervasive computing. Sounds awesome, doesn't it? But, what is pervasive computing, exactly? Well, IBM defines it as the ability to manage information easily. More specifically, it will enable people to accomplish an increasing number of personal and professional transactions using a new class of intelligent and portable devices giving them convenient access to relevant information anywhere, anytime.

Wow. What a mouthful!

BY JOE **FARSETTA**



In theory, pervasive computing will simplify life by combining open standards–based applications with everyday activities. It will remove the complexity of new technologies, enabling us to be more efficient in our work and leaving us more leisure time. Again, this is a loose interpretation of IBM's definition of pervasive computing. It's truly a powerful vision for the future. Clear, crisp, and concise. More importantly, tools like WebSphere will enable this vision to quickly morph into a reality.

So, will pervasive computing become the utopic computing environment of the future, in which everyone will carry a handheld device of some type? Will it really allow people to seamlessly and securely (right) connect to the "network" and do all sorts of nifty things, all from anywhere and everywhere? Sounds kind of like one of those futuristic car ads from the '60s, doesn't it? But, unlike what the automobile manufacturer's hype of four decades ago promised, technology such as WebSphere already exists. Not simply an engineer's futuristic concept of "tomorrow," this new technology has brought companies to the brink of revising the way they think and do business.

When someone questions the reality or practicality of pervasive computing and how it may affect our everyday lives, ask them some simple questions. Like, do they or their kids use a notebook computer at home, school, or work? Can their e-mail follow them wherever they go? Have they ever relied on a handheld device such as a Palm or cellphone (yes, cellphone) to schedule tasks and communicate? Do people around them rely on this technology at work? Have they thought of purchasing one of these devices recently? Can they envision any of this helping them to do more, or progress further? Chances are that they will answer a resounding "yes" to some of these questions – and there you have it. Pervasive computing is real, and in use today. Widespread and meaningful use of pervasive computing is what everyone on the software and manufacturing sides of the business is banking on. Wireless applications and technology are hitting the streets daily. Prices are falling. Microsoft and IBM are drawing battle lines as you read this. Let's face it; WebSphere Everyplace was made for this stuff! These evolving applications and technology are golden opportunities for all involved, for many years to come.

Mission-critical applications, with this technology at heart, will compose the computing frontier just over the horizon. For instance, a pharmaceutical salesperson may soon be able to check the entire inventory and order history of his largest customer with the click of a pen on a handheld – all while waiting for his meeting with that client to start. Armed with this knowledge, his company's sales will increase. In the end, this knowledge and power help assure that your local pharmacy has enough of a widely prescribed medicine in stock to cover the demand. That's pervasive computing at work. That's reality. That's the type of application that will require guaranteed availability. With everyone clamoring for a piece of the pie, and billions of dollars at stake, what will become a leading differentiator between "Provider A" and "Provider B"? The Service Level Agreement.

Background

Service Level Agreements (SLAs) are many things to IT professionals. An SLA can be as informal as an understanding of how things will be addressed between customer/supplier relationships within a single company. It can also be a 100-page legal document outlining specific roles and responsibilities between a service provider and a large client, where failure to meet the requirements of the SLA can result in multimillion-dollar financial penalties. Now, more than ever, the presence of an SLA in complex contract negotiations has quickly become the rule, rather than the exception. This article examines past, present, and future trends in this arena, and the long-range effects they will have on applications, service models, and enhanced offerings within the computing industry.

As a point of reference, I mention the term *service provider* throughout the article. Let me clarify what this is. I use the term rather loosely to describe an organization chartered to provide ongoing support of an application or system. Holistically, this includes all infrastructure, software, upgrades, break/fix duties, monitoring, reporting, inventory, etc. If you are in the game, whether as an in-house entity or an outsourced provider, an SLA may affect you.

In the Beginning

Not so long ago, the idea of a provider offering an SLA was little more than a sales tool. I say this because of the way in which these instruments were crafted, where any meaningful recourse on the client's part was conspicuously absent from any contract clause. Sometimes this SLA verbiage was incorporated into the provider's sales or service agreement, while other times it was found in separate documents. I can remember one Web-hosting provider's SLA, which boldly stated that if a client's site was down for more than eight consecutive hours, all monthly charges to the client would miraculously disappear. Nice, huh? Well, that depends. Once you really got into it, all the provider was really doing was giving the client the month for free, but buying the remainder of that month to remedy the problem. That's right! The agreement stated, in essence, that the client's site could be out of service or severely degraded until the cows came home (or at least until the month ended). Regardless of the monthly charges, what client can afford to have their site down for eight hours in the first place? But what was the client's recourse? Move out? Doubtful – what's the likelihood that a client is going to go through all the trauma and drama of negotiating a new contract and moving, perhaps only to wind up with a provider inferior to the one they're running from? Service providers know this, and take advantage of it, no matter what they tell you. In fact, they bank on it!

Another Web hoster made all sorts of promises as to their network's reliability. In the end, however, all that robustness was buried in confusing and contradictory legal terms, where "downtime" had to be determined by the client, using tools that were either unavailable or didn't exist. It also required the client to notify the Web hoster of the downtime event within a certain time period, or lose whatever miniscule reduction in monthly charges allowed as compensation. That's right; the SLA wasn't worth the paper on which it was written, but it looked nice. I'm pleased to say that customers are a whole lot smarter these days.

The Validity of Wanting an SLA

With all the horror stories and the hassle, why go with an SLA in the first place? Primarily because a well-written SLA is a very useful thing to have, for all parties involved. A poorly

ABOUT THE AUTHOR

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written, or one-sided, SLA almost assures an ongoing but hostile relationship. The real purpose of an SLA is as an instrument that sets rules, metrics, quality relationships, and measurable expectations between parties. The net result is a legal, binding, and enforceable agreement that gives and takes, punishes and rewards, and when all else fails, provides a mechanism for the client to walk away, with minimal risk. Remember, the SLA should never be crafted with only punishment in mind. It is merely a tool to help ensure system performance and reliability. Impossible you say? Never happen? Well, if you truly believe that, you're wrong.

Plan, Organize, Measure, Execute...

SLAs come in many flavors, shapes, and sizes. There are literally thousands of things that can be included in an SLA. For example, SLAs can include desktop support, server support, LAN support, WAN support, and Help Desk duties. Specific "time to repair" limits are typically required and serve as the measure of whether or not the provider is within SLA compliance or not. Other SLAs aren't component-specific in nature, dealing primarily with the "system" or "application" and whether it's available for some percentage of time or not. In either or all cases, and regardless of the specific content, the ability to successfully deliver service within the confines of an SLA lies in planning, measurement, and execution.

Planning. There's that word again. Crafting a comprehensive SLA is a complex effort. If you are a customer including an SLA in your RFP, you may be unpleasantly surprised to learn that your SLA requirements have added gargantuan hardware and support costs to the purchase price. This happens quite often. If you are on the receiving end of an SLA, you'd better do your homework. Analysis of *all* the requirements and long-range impacts on platform design, monitoring, and support must be comprehensive and detailed. Anything less is a sure recipe for business disaster, especially where stiff financial penalties are included for noncompliance. If your client relies on any WebSphere application or product to power their business model (yes folks, business model), including Portal Server, WES, Commerce Suite, et al., this affects you. If any are at the heart of the system, and you don't believe that these applications or components will need to be near-bulletproof when wrapped in an SLA, then you need to wake up!

Measurement is also key. It is, perhaps, the single most important aspect of and requirement for any SLA. The SLA sets all terms and conditions for performance and reliability. Most well-written SLAs will also set specific thresholds, benchmarks, and metrics. These factors may include latency and response-time criteria for LAN, server, and WAN components and circuits. It may also include repair-time thresholds and restoral time, as well as many other reliability and support parameters. The criteria will either be met, or not. To determine either instance, the ability to track and measure these factors is absolutely critical. A bit of advice, though; stay far away from any service provider that puts any of these measurement and notification responsibilities on the client! Some do, some don't. Those who do will quickly need to smarten up.

SLA Analysis and Understanding: A Key Component to Success on Both Sides!

SLA analysis is typically broken into two distinct pieces: business issues and legal issues. Here's where internal conflicts begin. For instance, some corporate attorneys believe they have the final say on the SLA document in its entirety. Better attorneys know that when it comes to the business issues, their job is to counsel and advise their business and technical counterparts. When it comes time to make the final decision regarding operational or business issues, the attorney leaves that up to others. Conversely, the attorney reaches out to the technical and business folks for counsel when he or she needs to understand something. Codependency is a crucial concept to understand and embrace in this type of effort. The team approach is the best methodology, as it is a key component for success on both sides.

Beyond the legal-technical friction that sometimes exists, friction between sales and operations is also quite common within vendor organizations and service providers. I have seen many an SLA cross my desk that included unreasonable performance guarantees, both in terms of vendor and client expectations.

Getting back to core analytical tasks, the true purpose of this undertaking is to separate which portions of the document can and cannot be achieved or properly supported. This means understanding the business, applications, hardware, data flow, and infrastructure before going any further. Once this knowledge is attained, the analysis of whether the computing environment will support the SLA begins. A simple example of this is a requirement for near-continuous uptime, with a proposed infrastructure that isn't truly fault-tolerant. If you're the service provider and you're aware of this clause, run for the hills! If you are the customer, and have dictated the environment for a provider to follow, you may be heading to Unpleasantville. If either party is dealing with budgetary restrictions, don't kid yourself into thinking that lofty SLA requirements are attainable at a low cost. Even if they were, chances are that the environment will eventually fail and the SLA parameters will be blown. Picture yourself being called on the carpet to answer basic questions, such as, "How did you think this could possibly work?" Yes, Mr. IT Professional, your job is to separate fact from fiction, and sales hype from operational realities. Also, never underestimate the critical importance of the application developer in an SLA analysis, as there may be some requirements that the application simply cannot achieve. Having the software experts participate in the analysis from the beginning is key and cannot be overlooked.

The initial analysis will determine whether the environment proposed will, or won't, support the requirements of the SLA. It's black and white. If it won't, documentation must be crafted and assembled to support your position, along with a viable solution either in terms of modifying the

"Never underestimate the critical importance of the application developer in an SLA analysis, as there may be some requirements that the application simply cannot achieve"

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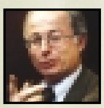

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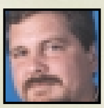

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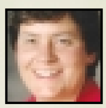

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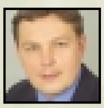

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SLA or enhancing the environment itself. If the environment supports the SLA requirements, the second step of the analysis begins: operational realities and business process architecture. Fancy words for putting the physical measures in place to support the SLA. For instance, if the SLA requires a 45-minute turnaround time for problem resolution, you'll need spare parts and people to meet this goal. If the SLA requires continuous on-site monitoring, prepare to either build and staff a Network Operations Center, or outsource the task. This is typically where the hidden costs of doing business come into play. A 24/7 staff of 6–7 people quickly adds up. Systems and network management platforms can also add huge costs to the project. But, regardless of who performs the support tasks, it will likely be costly.

A New Twist

A recent trend in SLA negotiations, propagated by some service providers, is the belief that penalties and rewards are somehow bidirectional. What this means, in simple terms, is that the service provider reaps an additional financial benefit for meeting the terms of the SLA, while still increasing the one-time and recurring monthly support charges needed to mitigate the risks associated with it. The client is, in effect, billed twice; once for supporting the SLA and again for successfully complying with the SLA. There are sometimes relational scales associated with how close the provider came to complying with all of the terms.

Now pardon me, but I thought that "close" only counted in horseshoes and hand grenades, so the logic behind this whole thing fascinates me. Let's think about this: Provider A has won my business, and agrees to the terms of a rather stringent SLA. Let's say the SLA calls for high system availability and a 45-minute turnaround for problem resolution. Knowing that Provider A is a responsible ser-vice provider, I'm confident that they've factored costs into their proposal that mitigate the risks associated with the SLA. The solution calls for a more fault-tolerant infrastructure, server clusters, systems and network management solution, people, spare parts, and so on. Now someone must pay for all this stuff, right? Usually, it's the client. After all, service providers are in business to make money.

So, will someone please explain to me why the service provider is somehow also entitled to be financially rewarded for meeting the terms of an agreement that he or she priced, analyzed, and signed up for in the first place? Well folks, this seems a bit strange to me. It's like paying the car dealer extra money because your new car didn't break this month! Would you do it? I know I wouldn't! Isn't that the reason we decide to pay more for the cars with the most reliable service record? The same logic applies for the costs associated with an SLA. The client knows what's important, has dictated the terms, and pays the costs associated with supporting the SLA. So, why anyone would agree to additional charges based on a success rate is beyond me. Nevertheless, some service providers are proposing it – and getting away with it, to boot.

An *at-risk pool* of money is also a popular way to mitigate any financial exposure to the service provider. This methodology builds a certain percentage of the one-time and recurring charges into an SLA fund. The financial penalty for noncompliance is calculated on a sliding scale of sorts, whereas the at-risk pool continues to grow and is capable of sustaining a hit. Other firms have tried to have their SLAs underwritten by insurance companies. This is a nearly monumental task. Although the likelihood of hardware and software failures can be curtailed through sound design practices, human failures, on the other hand, are much more difficult to prepare for. Insurance companies have a real problem with some of this, especially when a large financial penalty hangs in the balance.

Communication and Its Effect on the Decision-Making Process.

Once the analysis is done, and major issues remain, the most productive way to deal with the decision to accept the terms or walk away from an SLA is through simple communication. If you are the client, ask yourself why you have included certain things in the SLA. If you are the service provider trying to make sense of it all, ask the client why they have included the things they did. See things from the other side. Would you accept the terms? Would you have asked for what your client is asking for? Is any of it reasonable? Can these parameters be measured? How much risk is involved for either party? Ask these types of questions. Do some soul-searching. Remember, the idea is to build trust. With trust comes confidence, which will eventually lead to long-term and successful relationships.

If you're not sure how to do it yourself, reach out for help. There are a number of independent firms available to assist with SLA assembly, evaluation, and negotiation. I can't stress how meaningful a well-written, measurable, and enforceable SLA is in today's computing environments.

The Relevance of SLAs to Pervasive Computing

So, where does this all fit into the pervasive computing environment? Well, think about it. Wireless communication and computing is already upon us. But, if pervasive computing is to truly be more than a lark or multibillion-dollar boondoggle, nonstop data streams, communication modalities, and applications will need to be available 24/7 worldwide. Continuously updated databases will be the norm. Open standards and architectures in computing and communication will provide the mesh that is required to make it all work. Everything will be "always on," and behind it all will stand the guarantees that will be the de facto standard for any enterprise client betting their future on pervasive computing. These guarantees will absolutely be required before entrusting any piece of that future to anyone.

You need to understand the costs associated with converting an enterprise business model to take advantage of all of this. It's huge, not only in the cost of hardware and software, but also in soft dollars. Don't kid yourself; this is a megadollar adventure. Wrong decisions could cost people their careers and could ultimately bankrupt clients and service providers alike. SLAs can be nasty double-edged swords. Clients will demand guarantees, and service providers will demand high-end infrastructures and support models to help mitigate risk, while still making it cost-effective for both sides.

Conclusion

The terms and conditions outlining these relationships will come in the form of complex Service Level Agreements. For the service provider and client alike, it will simply become a willingness to put their money where their mouth is. Those who rely on slick and meaningless legal mumbo jumbo will fail. Those who understand the business and how to fairly and equitably mitigate risk while supporting a computing environment backed by a performance agreement, will flourish. It's that simple. Welcome to the world of pervasive computing.

The right tools for WebSphere development

Building Data Access Objects

BY JEFF **HANSON**

VisualAge for Java supports access to data stores in several ways. One mechanism is a framework of GUI components known as Data Access Beans, which wrap JDBC inside Java GUI components. This allows you to visually create and manipulate database applications using drag-and-drop techniques inside the Visual Composition Editor. This article will explore how VisualAge's Data Access Beans complement the Data Access Object pattern to create powerful, flexible data-access tools

ABOUT THE AUTHOR

Jeff Hanson has more than 17 years of experience in the industry, including working as senior engineer for the Windows OpenDoc port and team lead for the WebSphere integration project at Novell. He is currently chief architect for Zareus, Inc.

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Installing Data Access Beans

In order to use Data Access Beans, they must be added to your workspace. Select the Quick Start → Add → Feature item and locate the Data Access Beans and add them. This will add several GUI/visual beans (DBNavigator Bean, CellSelector Bean, RowSelector Bean, etc.) that can be used to build GUI applets and applications. Also added are three nonvisual beans that can be used in non-GUI applets and applications: the Select Bean, Modify Bean, and ProcedureCall Bean. We'll discuss the Select Bean throughout this article.

The Select Bean exposes properties that allow you to configure connection aliases and SQL specifications. By configuring these properties, you can connect to relational databases and access data. The Select Bean allows you to execute queries that return resultsets. You can browse, insert, update, and delete data using these resultsets.

Data Access Beans work with most JDBC drivers; however, the driver classes must first be added to your classpath. The Options window within VisualAge for Java contains a pane for adding files to your classpath. You must locate this pane and add the .jar or .zip file that contains the JDBC driver classes you want to use.

Deploying Data Access Bean Applications

Applications developed using Data Access Beans can be deployed inside any J2EE environment, such as WebSphere. Correct deployment involves modifying the classpath of the target J2EE environment to include two files, ivjdab.jar and ivjdab.zip. These files, residing in the VAJRoot/eab/runtime20 directory, contain the class files defining the Data Access Beans.

Let's Begin

The first thing we need to do is create a new project in VisualAge for Java. From the Visual Age Work bench,choose Selected → Add → Project. Name the project something really exciting, like "DAO Tester". Now, right-click on the project name and select Open. Once the project is open, right-click in the Packages pane and select Add → Package. Give the package any name you like, select Next, and then Finish.

The Zen of DAO

The Data Access Object (DAO) pattern provides an abstraction layer between the business tier and the enterprise information tier. Objects and components residing in the business tier access data sources residing in the enterprise information tier using DAOs. This layer of abstraction hides the details of each specific information-source/data-store implementation. Thus, changes made to each information source/data store won't affect the business-tier components. The individual DAOs are the only objects that need to change. Our implementation makes use of several standard design patterns, such as the Abstract Factory pattern and the Singleton pattern.

Introducing Our DAO Classes

The first thing we'll do is implement our DAO classes. Each of our interfaces and classes is created by right-clicking on our package name in the Packages pane and selecting Add → Class or Add → Interface. Since most of our DAOs will be wrapping exceptions in a specialized exception class, the first thing we'll do is add a generic DAO exception class as follows:

```
public class DAOException
extends RuntimeException
{
    public DAOException() {
        super();
    }

    public
     DAOException(String s)
{
        super(s);
    }
}
```

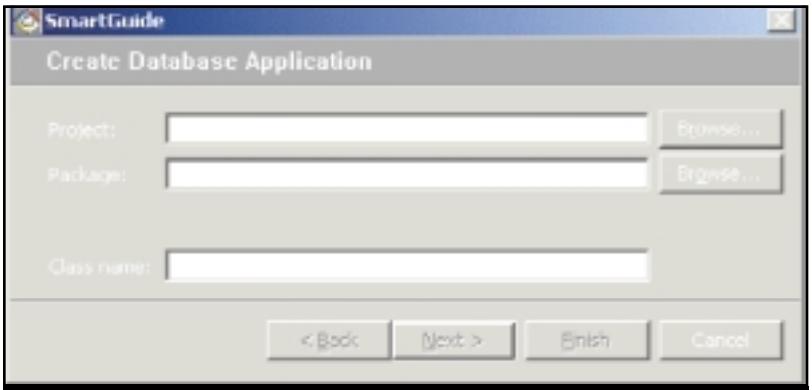

FIG. 1: CREATE DATABASE APPLICATION

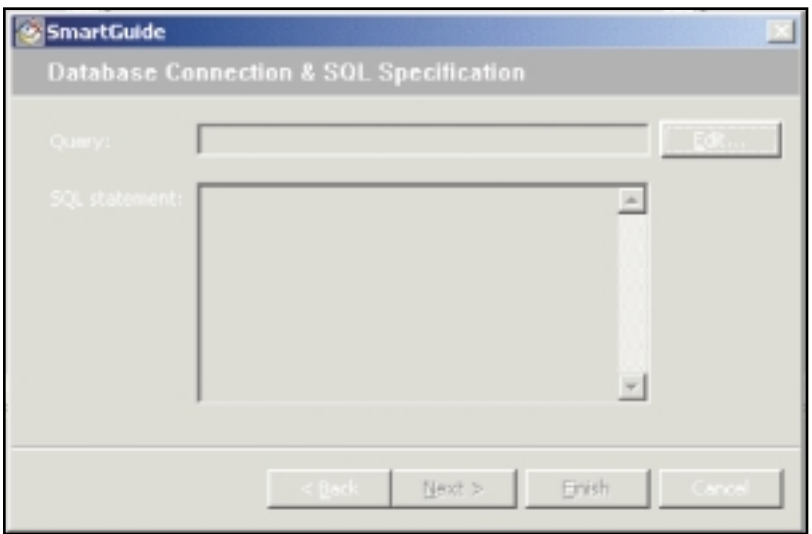

FIG. 2: DATABASE CONNECTION & SQL SPECIFICATION

Next, we'll add a generic DAO interface. The DAO interface exposes methods that embody the CRUD (create, retrieve, update, and delete) design pattern. The methods for this interface all take a generic Object parameter. We also add a close method to allow each DAO object to clean up any resources that it might be using.

```
public interface DAO
{
    public void close()
        throws DAOException;

    public void create(final
        Object object)
        throws DAOException;

    public void delete(final
        Object object)
        throws DAOException;

    public
        java.util.Iterator
        retrieve(Object object)
        throws DAOException;

    public void update(final
        Object object)
        throws DAOException;
}
```

Next, we'll implement our generic DAO factory class as an abstract class because we want to implement only one method in this class and allow the specific factory types to implement the other methods. The DAOFactory class adheres to the Abstract Factory and Singleton design patterns (see Listing 1).

Now we'll add a concrete DAO factory for our database DAO. We extend the DAOFactory class and implement the abstract methods (see Listing 2).

Next, we'll add a concrete DAO class for our database DAO. We create the DAO class and temporarily implement its methods as shown in Listing 3.

Create the Database Application

At this point we'll use a VisualAge utility that creates a GUI application based around the Data Access Beans. Select Project → Tools → Create Database Application. The window shown in Figure 1 will appear.

In the Package: box, type the name of your package or select the Browse... button and navigate to your package's name. In the Class name: box, type a name for your database application. For the sake of this article, type "MyDBApp" in this box and select Next. The window shown in Figure 2 will appear.

Select the Edit... button and the window shown in Figure 3 will appear.

Select the New... button and type the name of your package into the Package: box. Type "DBAccess" as the class name in the Class Name: box. Select OK. Make sure your new class name shows in the drop-down list and then select the Add... button (see Figure 4).

Type a name for your new connection alias in the Connection Name: box. Type the URL for your new connection alias in the URL: box. Select the driver for your new connection alias or type it in the JDBC Driver Input: box. Enter the User ID and Password as needed. Select Finish.

Click on the SQL tab. Make sure your Database Access Class is showing in the drop-down list. Select the Add... button. Type in a name for the SQL and select OK. Select the schema you want to work with and select the Add button. Select OK. Select the table you want to work with and select Next. Keep selecting the Next button until you come to the Columns page. Select the columns you want to work with and select Add. Select Finish. Select OK. Select Next. Make sure the *Create a navigation bar* checkbox and the *Create a table or master view* checkbox are not selected. Make sure the *Create a details view* checkbox is not selected. Select Finish. When the Visual Composition window appears, close it. You will see your new database application class in the Types pane. We can now merge our database application with our DAO classes.

All Together Now

For this article, we'll fill in the implementation for the retrieve(Object object) method of the DBDAO class. Listing 4 demonstrates the details for this implementation. Two things to note about this snippet are the use of the DataValueObject class, and the use of the com.ibm.ivj.db.uibeans.Select class. We'll discuss the DataValueObject class later. The com.ibm.ivj.db.uibeans.Select class handles most of the work for us. This class is retrieved from our database application class and has most of the database configuration details already set.

Notice that we get the Select object from the database application class, MyDBApp. With this object retrieved, we call the execute method on it to perform our SQL query. We can then access the data using methods on the Select object. If the getSelect() method is declared with private scope, simply navigate to its definition and declare it as *public*.

The next thing you'll notice is the use of the DataValueObject class. This is a simple data-model class that offers a layer of abstraction between the actual data and any business-tier classes that use the DAO. Our implementation of the DataValueObject class simply defines a DataId property, a JavaClass property, and a DataValue property (see Listing 5).

Miscellaneous Scraps

VisualAge for Java offers a handy little utility called "The Scrapbook." The Scrapbook is a text editor window that allows you to test snippets of Java code. It's very useful for testing, in our case, code fragments generated by the Data Access Beans generation tools.

To open the Scrapbook, select Window → Scrapbook. You'll be presented with a blank page into which you can type fragments of Java code. You can also copy and paste fragments of code into the blank page or open an existing file into the page. Once you have the code you want to test in the page, select the code to be tested and click the Run button. The results and/or any errors will be displayed.

Summary

VisualAge for Java is a powerful IDE that offers many tools for building Java and J2EE applications. It is tightly integrated with WebSphere. The Enterprise Edition of VisualAge even ships with a built-in WebSphere test environment that allows you to test WebSphere-targeted components and applications before deploying them to a production environment.

VisualAge for Java provides a powerful toolset for building applications that will access enterprise applications and data stores. This toolset includes the Data Access Beans tools and libraries. Combining the Data Access Beans tools with the DAO programming model empowers you with an information-access solution that handles multiple information sources in a generic manner. This solution is powerful, easy to use, and immune to many of the normal maintenance headaches that enterprise developers face.

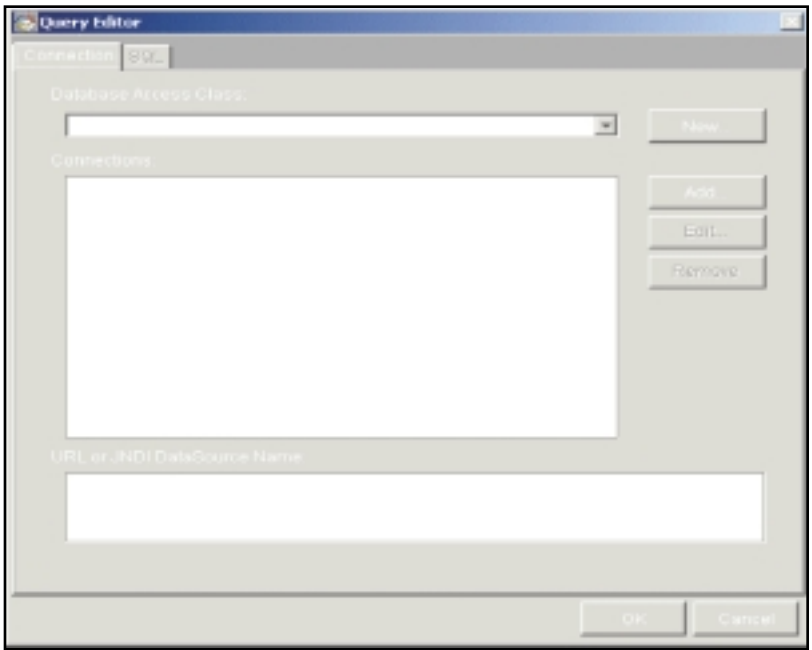

FIG. 3: QUERY EDITOR

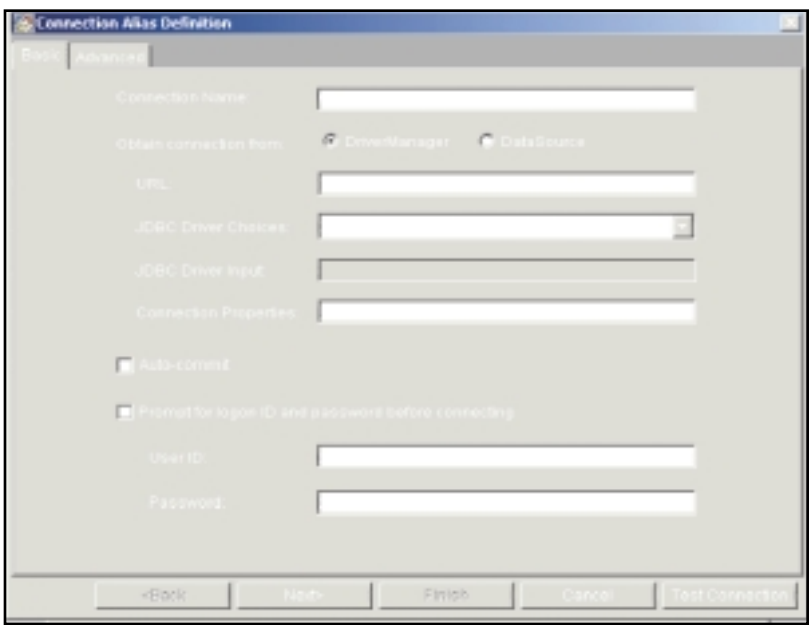

FIG. 4: CONNECTION ALIAS DEFINITION

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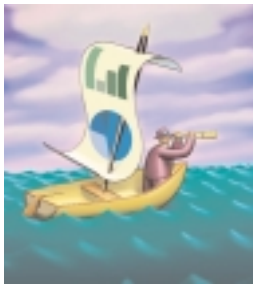
Don't go astray. In the vast sea of Internet technology, market conditions change constantly. Will Java remain the hot platform it is today? Will C# rapidly gain ground? What are the world's foremost Java developers aiming their sights toward? Which companies come to mind when planning their next project? How can their thinking direct your efforts?



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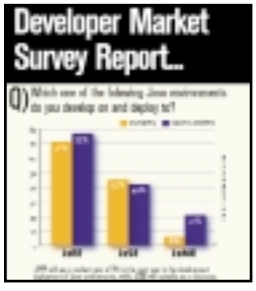

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*A limited number of preview copies will be available at our booth (#624) at JDJEdge International Java Developer's Conference & Expo, June 24–27, at the Jacob Javits Convention Center in New York.

LISTING 1

```
abstract public class DAOFactory
{
   private static java.util.HashMap instances = new
     java.util.HashMap();

   public DAOFactory()
   {
      super();
   }

   /**
    * We simply pass the name of the factory class to be
    *  instantiated as an argument to this method. This
    * should be retrieved from a configuration file or
    * other source in production code.
    */
   public static DAOFactory getInstance(String className)
      throws DAOException
   {
      if (instances.get(className) != null)
         return (DAOFactory)instances.get(className);

      try
      {
         DAOFactorydaoFactory =
            (DAOFactory)Class.forName(className).
             newInstance();
         daoFactory.initialize();
         instances.put(daoFactory, className);
         return daoFactory;
      }
      catch(Exception e)
      {
         throw new DAOException(e.toString());
      }

      return null;
   }

   abstract public DAO getDAO() throws DAOException;
   abstract public void initialize throws DAOException;
}
```

LISTING 2

```
public class DBDAOFactory extends DAOFactory
{
   public DBDAOFactory()
   {
      super();
   }

   public DAO getDAO() throws DAOException
   {
      return new DBDAO();
   }

   public void initialize throws DAOException
   {
      // any initialization will be handled here
   }
}
```

LISTING 3

```
public class DBDAO implements DAO
{
   public DBDAO()
   {
      super();
   }

   public void close() throws DAOException
   {
      // free up any resources here
   }

   public void create(Object object) throws DAOException
   {
      // insert new rows of data here
   }

   public void delete(Object object) throws DAOException
   {
      // delete rows of data here
   }

   public java.util.Iterator retrieve(Object object)
      throws DAOException
   {
      return null;
   }

   public void update(Object object) throws DAOException
   {
      // modify rows of data here
   }
}
```

LISTING 4

```
   /**
    * Due to space constraints, we show the implementation
    * for the retrieve method only
    */
   public java.util.Iterator retrieve(Object object)
      throws DAOException
   {
      java.util.Vector valueObjects = new
       java.util.Vector();

      try
      {
         com.mycompany.MyDBApp aDBApp = new com.mycomp-a
          ny.MyDBApp();
         com.ibm.ivj.db.uibeans.Select select =
          aDBApp.getSelect();
         select.execute();
         int       colCount = select.getColumnCount();
         int       rowCount = select.getRowCount();
         for (int i = 0; i < rowCount; i++)
         {
            for (int j = 0; j < colCount; j++)
            {
               String   colName = select.getColumnName(j);
               Class    colClass =
                         select.getColumnClass(j);
               Object   colValue =
                         select.getColumnValue(j);
               DataValueObject dvo =
                     new DataValueObject(colName,
                      colClass, colValue);
               valueObjects.addElement(dvo);
            }
            select.nextRow();
         }
         select.disconnect();
      } catch (Throwable exception) {
         throw new DAOException("Exception in retrieve: "
           + e.toString());
      }

      return valueObjects.iterator();
   }
```

LISTING 5

```
   public class DataValueObject
   {
      private String dataId = "";
      private Class javaClass = null;
      private Object dataValue = null;

      public DataValueObject(String dataId, Class
        javaClass, Object dataValue)
      {
         this.dataId = dataId;
         this.javaClass = javaClass;
         this.dataValue = dataValue;
      }

      public String getDataId()
      {
         return dataId;
      }

      public Class getJavaClass()
      {
         return javaClass;
      }

      public Object getDataValue()
      {
         return dataValue;
      }
   }
```

WEBSPHERE NEWS

NEW BUSINESS INTEGRATION SOFTWARE CUTS COSTS, ACCELERATES E-BUSINESS

(San Francisco) – IBM has announced new WebSphere infrastructure software, WebSphere Business Integration Version 4.1, to solve today's top I.T. priority: reducing the cost and difficulty of integrating disparate business applications and systems.

IBM WebSphere Business Integration Version 4.1 enables customers to carry out a business activity — regardless of the systems involved — across business applications such as ERP and Customer Relationship Management and to quickly and cost-effectively implement business processes across the enterprise. It integrates and simplifies business processes using proven, secure and scalable technology to accelerate e-business initiatives for customers, suppliers, partners and employees. www.ibm.com

LOGICLIBRARY PROVIDES ASSET MANAGEMENT SERVICES FOR WEBSPHERE STUDIO

(San Francisco) – Software development teams using IBM WebSphere Studio, based on Eclipse, an open platform for e-business application development, have access to a powerful set of asset management services from LogicLibrary Logidex. The integration of Logidex with WebSphere Studio allows developers to move easily from the Studio family of tools to the Logidex Asset Library, where they can retrieve essential information about their software development assets. Assets can include Web services, legacy applications, components, XML schema, frameworks and patterns.

IBM WebSphere Studio allows Java developers access to a complete suite of tools to build e-business applications. These applications can be created from prebuilt software assets, from scratch, or using a mix of resources including in-house and external Web services. www.logiclibrary.com.

ECLIPSE TOOLS PROJECT FORMS NEW COMMITTEE; ADDS MEMBERS

(Chicago) – The Eclipse Tools project management committee has announced formation of the Graphical Editor Framework (GEF) Project (http://eclipse.org/tools/gef-proposal.html), to develop a framework for rapidly creating and customizing visual development tools. Visual tools are a key component of integrated development environments, allowing developers to depict design objects and their interconnected relationships. These features make it easier to turn concepts into running systems that are easier to support through the deployment life of projects.

The Eclipse community also welcomes Fujitsu, Serena Software, and Sybase as they join with Borland, IBM, MERANT, QNX Software Systems, Rational Software, RedHat, SuSE, TogetherSoft, and WebGain as supporting members. Representatives of these companies, each of which plans to release Eclipse Platform–based product offerings, expand the Eclipse Board of Stewards to 12 members. http://eclipse.org

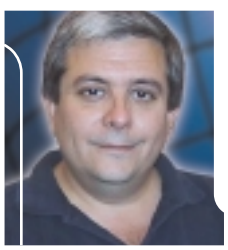
Creating a solid partnership

Data –

Make It Accessible and Valuable

BY JIM **MARTIN**

In past columns we looked at several ways that sales teams can work together and the considerations involved in a successful sales process. This month let's get a little further inside of a big customer's thought process, a customer who out of the gate requires high scalability. These are customers with multi-tier architectures, terabytes of data storage, sophisticated business logic, distributed applications, and a very real need for maximum uptime. These are the customers who bring the greatest challenges – and the greatest rewards.



ABOUT THE AUTHOR

Jim Martin has worked in the system integration and communications industry for the past 15 years. Working on design and implementation teams, he has been instrumental in deploying Web based mission-critical systems. Jim currently works as the director of sales at SKC.

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With the bitter smell of tax season still lingering in the air, a great example comes to mind. If you live in California I hope you filed your taxes; the State of California Franchise Tax Board (FTB) has taken a giant step in tracking tax filings by building an e-business infrastructure that handles the 14 or so million tax returns filed in California each year. More importantly, they also needed the ability to track and identify the roughly 7% of the people who are nonfilers. This is almost the definition of scalability and availability.

As electronic tax filing increases each year the FTB recognized that they had to move their environment into the Internet age or they would be left with multiple datastores that had little to nothing in common, thus creating labor-intensive processes that would still leave holes in the tracking process. "Historically, we've had about 7 to 9 million pieces of information we could not use, mainly because the information was incomplete and our legacy system was unable to process it," says Cathy Cleek, FTB program director. "Now, even if we're missing an identification number or an address, the information is still useful. We use data-cleansing technology to derive as much value as possible from our data in order to locate non-filers." The FTB incorporated data-cleansing technologies from Vality Technology, Inc., and Evolutionary Technologies International (ETI), both of which are IBM Business Partners. "By making better use of our data, we'll be able to identify an additional 100,000 non-filers and bring in an additional $50 million each year."

Setting out on the project, the architects knew that the infrastructure would have to have the highest availability and be scalable enough to handle both a public Web site and the 2,000 users internal to the FTB. The ROI had to pay off near-term. The last thing the State of California wanted was a high-profile, high-cost project that failed to deliver on its promise. The architects and planners looked at what other states had done with their tax initiatives and tried to learn from their successes and failures. Two things became obvious early on: 1) the solution had to be industrial strength, and 2) the solution vendor had to be highly qualified.

The team looked at and evaluated the best-of-breed technologies for the applications and the environment in which they would run. Because of the size and prestige of the project there was no shortage of attention from the top vendors in this space. The FTB evaluated solutions from IBM, Oracle, and AMS. "IBM offered the best value – a combination of the strongest technical solution with an attractive price and strong potential for generating fast returns," says Cathy Cleek. "There was a very powerful ROI model that was very hard to ignore, even for a state the size of California. IBM pushed us in the e-government direction sooner than we had planned – and I'll always be grateful for that," says Cleek. The project provided a foundation for later moving other state processes to the Internet. making the original project an incubator for future initiatives.

The ROI model wasn't based solely on the cost of the infrastructure; it also had to incorporate the cost of deployment, maintenance, and the future costs of adding applications and functionality. To keep a state-of-the-art system state of the art one of two things must occur: either you continually engage a technology partner or you have the ability in-house to grow and maintain the system. IBM Global Services assisted in the implementation of the system but also acted as a mentor to the FTB IT staff to prepare them for the future.

Whether the vendor selection is IBM Global Services or another service provider it's important to select a vendor with more than a working knowledge of the required skills; they need to be experienced experts. The tech-

nology provider and the customer need to work in lock step with one another and share a common vision of what the project objective is and where the technology will take the business later on. If either of these components is missing, the entire initiative could be placed in jeopardy. A high-volume, mission-critical system of this nature required much more than just service delivery. It required a mentoring partnership between the customer and the technology provider "It would have been difficult for us to manage a project of this scope without assistance from IBM Global Services," notes Cleek. "Besides, working with large IT vendors exposes us to new ideas that enhance our skills base."

The system was developed using Java technology. The development team used IBM VisualAge for Java to create the Java servlets and Enterprise JavaBeans (EJBs) that provide the business logic within the system. VisualAge provides two resources that were very important to the development team; server side debugging tools and it is a proven, very reliable development environment. The tool's version control ability to track and recover previous programming efforts made it easy for members of the development team to retrace their steps when programming changes were required. More importantly, the servlets provide a centralized element of control while also providing platform and browser independence for users. Truly a best of both words model.

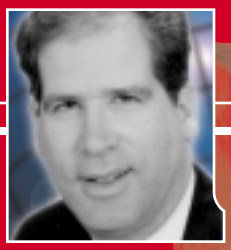
"We wanted to use the latest open technologies, so we could easily make enhancements and incorporate new functionality into our system. We also wanted to work with a vendor that would be around for a long time. IBM has more than satisfied us on both counts." Again this was used as a factor in determining ROI. Future functionality would be completely within the control of FTB because the system was designed using open standards. They would be in control of their own destiny and would not be beholden to proprietary technology or handcuffed to a vendor who held the keys to the kingdom. "Considering the additional revenue generated as well as efficiency enhancements, we earned a full payback on our IBM business intelligence solution within just one year." Said Cleek. When future enhancements are factored in the long term ROI model will present even better economies.

So what are the most important factors in the customers decision to buy WebSphere? The environment addressed the most important concerns without compromise.

1. The application environment is a proven industrial strength approach that will scale as more functionality is needed.
2. The customer and technology provider shared the same vision of what the intent of the business process improvement was all about.
3. Open standards allowed the customer to take control of the future direction and uses of the system.
4. The technology provider fulfilled the customer needs at each critical point. There were no patchwork solutions for melding disparate technologies.
5. The technology vendor was expert at what they were attempting.

Conclusion

The more a technology project becomes a solid partnership the more effective the outcome will be. In this case there was a customer who had a very clear vision of where they needed technology to take them. They were open to listening to experts from many different technology providers and made their decision based upon proven abilities, systems that run in the real world, not just in Powerpoint. Maybe, this isn't a good case study because here we have a combination of superior technology and an open-minded customer who had a definite vision of where they needed technology to take them. The result is a scalable solution that has improved the efficiencies of the FTB in California. If you live or work in California, I hope you filed your taxes because now the tax man cometh and he has WebSphere with him.



ABOUT THE REVIEWER

Richard Gornitsky is vice president of client services at Diogenes, Inc., a software manufacturing company that develops products to integrate applications over the Internet. He has 21 years of experience in managing and designing heterogeneous systems and infrastructures from Wall Street enterprises to software manufacturers such as IBM.

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IBM WebSphere Application Server: The Complete Reference

REVIEWED BY RICHARD GORNITSKY

Diogenes is a startup software manufacturing company that develops products to integrate applications over the Internet. We were looking for a book to help us integrate our product, iMercury, into IBM's WebSphere Application Server. iMercury is a 100% Internet-designed Java messaging product that is lightweight, self-configuring, RSA security–enabled, and provides automated installation and configuration. I stumbled onto Ron Ben-Natan and Ori Sasson's *IBM WebSphere Application Server: The Complete Reference*. Given my pleasant experience with their previous book, *IBM WebSphere Starter Kit*, I felt that this would be a good reference source for the WebSphere Application Server.

But they lied! The title misrepresents the book. It's much more than a complete reference for IBM WebSphere Application Server. It covers the entire WebSphere brand and the Internet technologies it supports in clear, easy-to-understand English.

This book is ideal for developers, system administrators, system architects, and managers. Developers get an overview of the different technologies with simple, clear examples. References are given if additional detail is required. System administrators have a source that provides information on installing, starting, and troubleshooting WebSphere. System architects and managers will enjoy this single reference which covers all the hot Internet topics from EJBs, connection pooling, to Web services. The readers will also love the CD-ROM that comes with trial versions of the WebSphere Application Server, WebSphere Server, WebSphere Studio Application Developer, and VisualAge for Java (I would buy the book just for the CD).

What's Included

The book is massive, with over 967 pages full of relevant content (as opposed to tons of irrelevant GUI screen shots in other books). The type is easy to read with concise examples and GUI screen shots where appropriate. It's divided into nine parts, each building logically on the previous one.

The first part introduces the reader to the WebSphere brand, including installing and starting WebSphere. It introduces HTTP servers, servlets, JSPs, and EJBs. In the second part, the authors go into more detail and introduce CORBA, Internet Inter-RB Protocol, XML, Java security, Java Messaging Service (a personal favorite of mine), and J2EE. The third part provides an overview of the WebSphere development environment; specifically WebSphere Studio Application Developer and VisualAge for Java. While this book will help you get started with these development environments, serious developers will want to purchase additional books.

Part four focuses on the core components of the WebSphere Application Server. For us, this was the most relevant area. The book's explanation of WebSphere's connection pooling, data access beans, logging, and security services provided the knowledge necessary to understand how to exploit these features.

Part five goes into detail on servlets and JSPs. On servlets, it focuses on various types of HTTP servlets and servlet sessions (including how to handle cookies). The servlet sessions start with general issues and then drill down to WebSphere-specific issues, such as error handling and the WebSphere Session Tracking API. The JSP section also starts with general elements and drills down to the IBM-specific JSP tags. The authors then give a multitude of examples (over 19 pages), and discuss the "JSP complexity problem." Part five concludes with a detailed discussion of debugging servlets and JSPs.

Part 6 discusses everybody's favorite subject: EJBs, those magical code entities that are the solution to every problem. The book explains EJBs, providing realistic comments on stateless and transaction beans, their features and limitations. Everything from entity beans to Message-driven Beans is explained, concluding with how to use EJBs in a multitiered application.

Part seven deals with today's hottest technology: XML and Web services. The authors explain how to use XML by giving e-business application examples and then discuss Web services: SOAP, WSDL, and UDDI. Part eight discusses internationalization and localization issues.

Finally, but most important for system administration, part nine discusses administrating WebSphere sites. This very important section discusses how to configure WebSphere for high availability. It also explains how to use the administrative console and its tools, and administer security. Frankly, I would have preferred to see this section closer to the the front of the book.

Conclusion

IBM WebSphere Application Server: The Complete Reference is a comprehensive book that's an ideal for any WebSphere administrator or developer. It would also be useful to any person who wants to understand the components of Internet development.

TITLE:
IBM WEBSPHERE APPLICATION SERVER: THE COMPLETE REFERENCE
AUTHORS:
RON BEN-NATAN AND ORI SASSON
PAPERBACK - 966 PAGES
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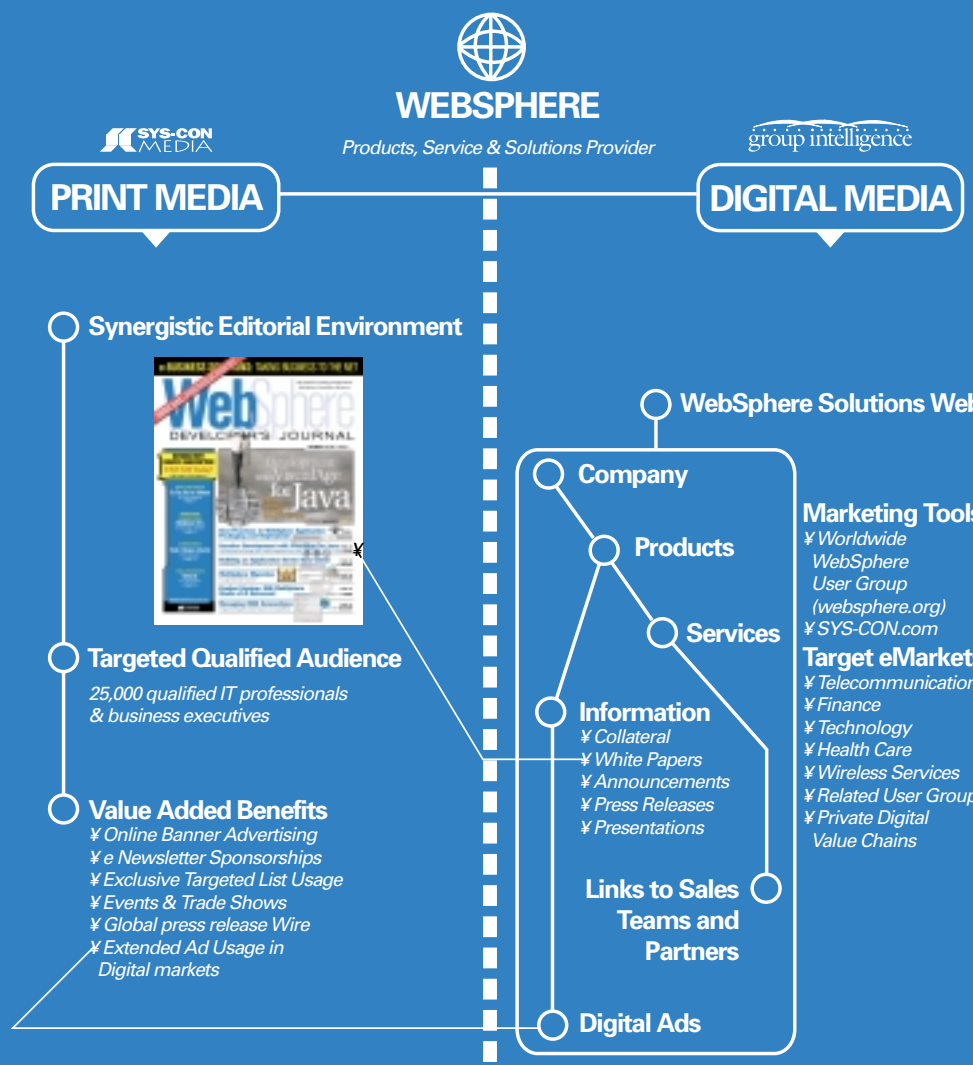

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Rational's newest Java-focused UML tool looks good for WAS developers

Rational XDE

BY JAY **JOHNSON**

Developers using WebSphere Studio Application Development (WSAD) for J2EE development were left out in the cold when it came to UML-based Java IDEs. While WSAD provided an excellent testing environment due primarily to its fully-integrated Websphere test server/container, Java developers had to look elsewhere for UML support. Now Rational has taken a major step toward turning WSAD into a full-featured design tool: XDE.

XDE is definitely a move in the right direction; it fits into the Rational Unified Process and integrates with Rational's ClearCase. After jumping through a few hoops, you can even import ROSE J diagrams. Most important, XDE is integrated with WSAD, allowing for easier deployment and testing with the WAS test server inside the IDE.

Using features in the WSAD/XDE duo, you can generate code from a database schema, then reverse engineer the code into class diagrams. XDE fits into WSAD seamlessly, and navigation is intuitive. It supplies Gang of Four patterns and provides users with the ability to create their own patterns. XDE also provides additional EJB deployment capabilities, supporting Weblogic 5.x and 6.x and the Sun reference implementation. J2EE patterns are available for free at www.rational.net.

Views

WSAD is built on the open-source Eclipse IDE, and divides features into "perspectives" and "views." XDE fits into the WSAD/eclipse paradigm as a perspective under the "other" category. To invoke XDE in WSAD, you need to click on Perspective>Open>Other>Modeling. Once you're in the XDE perspective, you have the choice of creating three different types of models:

- ***Basic model:*** Does not support code generation
- ***Java model:*** Includes support for modeling Java in UML and generating code, as well as creating patterns and code templates

- ***Web model:*** Specifically for modeling and designing a Web application using JSPs, tag libraries, servlets, EJBs, and other Java elements

When you create a Java or Web modeling project, WSAD's Java perspective and its related views (Hierarchy View, Outline View, etc.) automatically become available.

You can view the diagrams and code in a model simultaneously. XDE also keeps code and diagrams synchronized. The code markers that are generated may be turned off through User Preferences.

```
/** @modelguid {2C480A72-
7B0B-4E08-A8E0-1A92270E1884}
*/
    public int rate;

/** @modelguid {4201764C-
6749-485B-9B38-BDAF3FAF2167}
*/
    public MortgageInfo()
```

Other UML tools have overcome the need for cluttering up the code; I'm sure XDE will do so as well.

Diagram Elements

XDE contains a very rich set of diagram elements to support the UML and facilitate abstraction divided into categories by diagram type. They include many kinds of elements, including a "Friend Permission" connector. EJBs and other J2EE components don't really fit into standard UML diagrams yet, and all UML modeling tools have the problem of not quite knowing what to do with them. XDE is no exception, although it provides 13 symbols for modeling EJBs, including 1.1 CMP and 2.0 CMP beans, that enable one-click creation of model elements instead of going through wizards. You can also create a custom toolbox containing only your favorites. XDE collects the EJB symbols, along with the servlets, classes, interfaces, and connector

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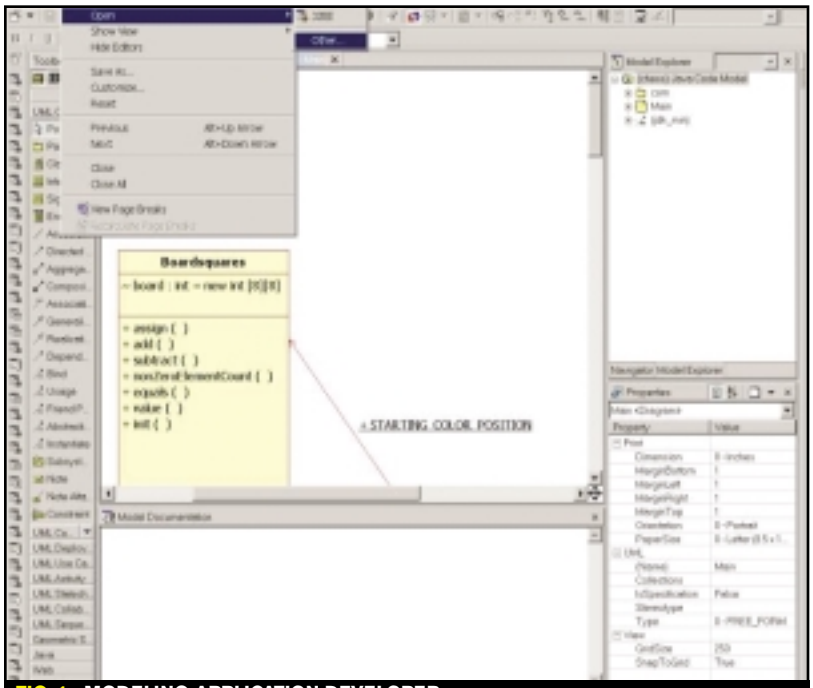

FIG. 1: MODELING-APPLICATION DEVELOPER

symbols, into a diagram category called "Java." JSPs are included in the "Web" category (see Figure 1).

The Rational XDE online help states that a default diagram is created when you apply an EJB pattern; however, this is not supported. You can use "Add Related Shapes" to create custom diagrams based on your parameters (see Figure 2).

My 700 MHZ, 640 MB machine struggles a bit to run the WSAD/XDE combo. Perhaps the performance of the package will be upgraded in the next release, but hardware is cheap, so this isn't a big priority.

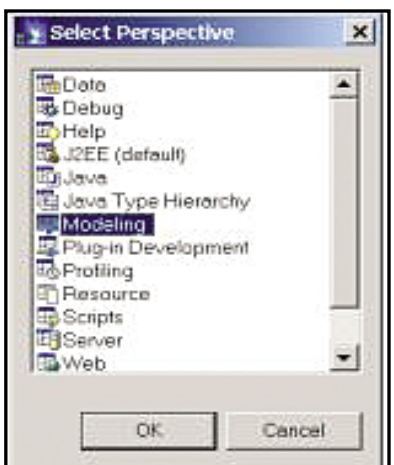

FIG. 2: SELECT PERSPECTIVE

Using XDE, developers and business analysts can draw use case and activity diagrams to their hearts' content. It supports these diagrams as well as any tool I've seen. XDE also supports other essential UML diagrams such as state charts and deployment diagrams, with an unusual twist: freeform drawing, complete with generic geometric shapes. On a freeform diagram you can incorporate symbols from any of the diagram categories. With this feature, you can document the parts of your application that don't quite fit the standard diagrams. It addition, it may make it unnecessary to buy a copy of Visio!

References

Rational XDE maintains live references across models. Cross-model references allow you to remain in your current model and make dynamic updates to elements located in other models. For example, you can link a class defined in an analysis model with the realization of the class in the corresponding design model. A change in one triggers a change in the other. This feature keeps models for analysis, design, and implementation synchronized, and provides a realistic chance for traceability from one development phase to another.

Reverse engineering is one of the most important features developers need in an IDE. The XDE/WSAD combo does a fine job here. Developers can take existing code and turn it into class diagrams with a minimum of effort. XDE doesn't come up with a default layout for newly reverse-engineered code – the user needs to drag-and-drop the created classes onto the diagram. Once any class is on the diagram, however, you can select it and click on "Add Related Shapes." This will add the classes that have relationships with, or dependencies on, other classes.

Availability

XDE is available only for Windows 2000/XP. In future releases, I hope to see better support for reverse-engineering EJBs, and auto-generation of sequence and collaboration diagrams. If Rational is as serious as it seems to be about supporting Java, XDE will soon run on Linux and Solaris. It also needs to get rid of the code tags that are, by default, inserted before every instance variable and method in generated Java.

Conclusion

XDE transforms WSAD into a full-functioned UML-based IDE. This goes a long way toward making WSAD the only real choice for WebSphere J2EE developers.

Rational XDE

COMPANY INFO:
Rational Software Corporation
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Getting member feedback is crucial

Keeping It Fresh and Real

BY TONY **McCUNE**

I don't know about you, but when it comes to volunteering, I usually get "volunteered" for more than I expect. That was the case when I was nominated as president of the local WUG (WebSphere user group) here in Atlanta. I'd said I would serve in whatever capacity was needed. President wasn't exactly what I had in mind. It has been fun and at times challenging, but as we enter our second year, our membership has grown and changed. As a founding member I've had the opportunity to see this organization evolve from a vision into a group "owned" by a couple businesses – until now. We've begun to grow a personality of our own. From my experience of the past few months and from years of experience with other groups, there are a few things every user group leader needs to keep in mind for keeping the group on focus.

ABOUT THE AUTHOR

Tony McCune works for CrossLogic, a WebSphere and Java training and mentoring firm. Tony was a founding member and currently serves as president of WUG Atlanta.

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Have a Stated Mission and Goals

To be a successful WebSphere user group you have to be sure the group is getting information relevant to WebSphere. Seems obvious, right? In the thick of things we can be pulled into offering topics and presenters who seem to fit the bill, but upon closer scrutiny really aren't helping the users become more proficient at using WebSphere. It has proven to be valuable to put the group mission and goals down on paper (or in our case HTML) to refer to as we make choices about who will speak, sponsor events, or otherwise influence the direction and content the user community sees.

Keep Your Finger on the Pulse

In case you didn't notice, technology is quickly changing. Some users will be using WAS v3.02, others 3.5, and a quite a few 4, so make sure the topics covered work for a majority of the group. The best way to be sure the members are being served is to ask. We distribute a short survey at the end of each meeting asking the members about their impression of the topic and content of that meeting, as well as what they would like to hear more of. Don't let vendors or loud voices in the crowd determine the direction – be a consensus leader; it will pay you back in satisfied members.

Don't Be a Lone Wolf

WUG leadership is a volunteer job, so get some volunteers. Don't get caught up in the details of all that has to be done. In our case we meet at the IBM building, so we need to be sure we have a room reserved and IBM employees to escort us to each meeting – in addition to lining up speakers and a sponsor to provide refreshments. Have a committee or board with clearly defined roles for each member. We have a president, vice president, secretary, and membership director. This distributes responsibilities and provides mutual accountability, so we can be sure we're ready for each meeting. I think it's especially important that there be a balance of users and vendors that serve on the board. Don't ever let the members get the impression that it's just one big marketing event; membership will suffer if you do.

Beware of Poachers

Believe it or not, there are marketing professionals out there targeting your group to sell products and

recruit your members to work for their clients. Okay, if you've ever been to any user group meeting, you figured that out pretty quickly. Vendors aren't the enemy, but badly behaved vendors are. If you're the group leader, don't put up with pushy vendors who can't take a hint. Set guidelines and put them in writing on your Web site or in handouts at the meetings. If attendees violate these guidelines don't hesitate to talk with them. Most people will behave responsibly if given the chance. If a vendors are there to build relationships and learn more about WebSphere, welcome them in; they may have something to contribute. If you have your policies down in writing, it will be clear when someone is violating them, and you can just blame the policy when you ask them to stop.

Mix It Up a Little

We made a choice early on to be sure all sectors of our user community had an opportunity to speak and hear topics that were relevant to them. You can't please everyone every meeting, but you can be sure to please everyone once a quarter. We identified three unique groups of interest within the group and we try to cover all three each quarter.

We know everyone wants to hear from IBM regularly, so we schedule in an IBM presenter once a quarter. We are constantly bombarded with vendors who want to show their wares. We try to choose vendors who can demonstrate a value to WebSphere-specific topics and we do that once a quarter. Finally, users want to know what other users are doing, so we make every effort to be sure we regularly get our members to present what they've built or show how they manage solutions using WebSphere. By doing a quarterly rotating schedule, we hope to keep the information fresh and the members informed.

What Works Best

One of the most successful meetings we've had to date was when we brought in Mark Travis, the IBM product manager for WebSphere Studio Application Developer and Eclipse. We promoted it heavily to all of our membership and had a great turnout. Our users were interested in hearing what capabilities WSAD had and how they could migrate from VAJ to WSAD. This meeting was a direct result of getting feedback over several months from our user community and taking steps to locate and book a speaker who could speak directly to those interests. Atlanta has over 150 chapter members. We learned that the key to getting a good turnout is to let them know early and often what we're going to present. Most members choose whether to attend each month based on the topic being presented.

Building a solid user group has its challenges, but if you take care to keep these few steps in mind, you will see your group grow consistently and a core group will begin to emerge. Happy WUGing!

WEBSPHERE USER GROUPS...

www.websphere.org offers Web space to user groups worldwide for posting contact and meeting information. The site's LISTSERV offers peer-to-peer e-mail Q&A and has hundreds of subscribed members from all over the world. The site's current instant poll ("Share Your Views") enables members to vote for appropriate meeting topics. For site sponsorship and general information contact info@websphere.org.

WebSphere Developer's Journal Coming Next Month...

WebSphere Developer's Journal takes a close look at WebSphere Portal 4.1 with...

— ***An Interview with Carol Jones***
Architect of WebSphere Portal Service

— ***An Interview with Larry Bowden***
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— ***Mobile Access Portlets for WAP Devices***
An environment for building portal Web sites for wireless use

— ***The Business Intelligence Imperative***
Strategies for information access and delivery

— ***Lotus Collaborative Places for WebSphere Portal 4.1***
Enhance your' ability to find, retrieve, and manage both information and people resources

— ***How To Write Portlets***
Bring your product into the portal era of the Internet

Be Careful:

What every business executive needs to know about Web services

BY JOHN **SWAINSON**

Sometimes the mistakes of youth can haunt a person later in life. If you aren't careful, the same could happen to your business with high-tech's latest industry game changer: Web services.

It's the next phase in e-business and something every executive should be considering. If the first phases of e-business focused on extending existing business systems to the Web, this next phase is about linking your systems with those of your suppliers, customers, and partners. This will save time and money, and could change the competitive landscape.

Web services are nothing more than Web-based interfaces to applications that enable them to communicate and collaborate on tasks without human involvement. The magic is that by using an interface based on industry standards (you may have heard of some of them, such as XML) you can rapidly open up a closed technology infrastructure and turn it into one that can be accessed in a variety of different ways. This is equally useful for integrating applications inside a company or between companies.

Take the travel industry, for example. With Web services, an airline could publish information about flight status and schedules. If a flight is delayed, the airline can quickly notify not just the passengers (via phone, e-mail, or pagers) but also other companies in the "chain," including hotels and rental car companies, of the passengers' revised arrival times and reschedule connecting flights affected by the delay.

One reaction might be: "What's the big deal, can't you do this with existing technology?" The answer is a qualified yes. Given enough time and determination, you could figure out all the different interfaces and protocols that the hotel, rental car company, other airlines, and customer used, and negotiate with them to provide the information. It might take months or even years to do this, which for many applications is the kiss of death. With Web services, using standard Internet technology, you can publish this information once and anybody can pick it up, without changing their existing systems.

Health care is another industry that will benefit from Web services. Hospitals, labs, pharmaceutical companies, universities, and doctor's offices all generate large quantities of information about patient care and disease prevention. Web services provides a way to start accessing that information, and bringing it to bear on solving individual medical problems. For example, health care providers could use Web services to gather diagnoses, lab results, and other relevant information about a patient and make them available to the doctor, even at the bedside. It's important to realize that these data may be generated by completely different systems, with different data formats and different capabilities; Web services allows them to publish their data in ways that others can use, without forcing all the individual sources to work the same way.

But you could get off on the wrong foot with Web services and regret it for a long time. Some Web services will be reusable on any hardware platform running any operating system. That means you can reuse the application on any device, from a pacemaker to a mainframe. But others will only be able to run on one operating system and one hardware platform.

This seems innocent enough on the surface, but consider the inner workings of a typical car manufacturer that wishes to implement Web services to integrate its ordering system with its supply chain. Dealers will enter new orders from wireless devices or desktop PCs. The new orders will interoperate with a database on a mainframe that will arrange to have the cars sent out. From there a message must be sent to a database from a different vendor running on a mainframe from a fourth vendor to send new parts down to the factory floor. Those parts will need to be replenished via orders to various suppliers. Management uses desktop computers and wants to view all transactions.

If the desired Web services applications are built to a proprietary software architecture, any machine using these applications – from wireless devices, to laptop computers in the field, to mainframes – would need to be replaced with machines running the same proprietary software and hardware.

But if the Web services applications are based on open standards, nothing will ever need to be replaced. That's the beauty of Web services. Adopt an open architecture once, and you don't have to keep rebuilding it as business conditions change and the Web keeps evolving.

Open or proprietary? That's the key question to ask as you embark on Web services. Plot your future wisely.

ABOUT THE AUTHOR As general manager of IBM's Application & Integration Middleware Division, John Swainson has global responsibility for strategic middleware technologies – Web application servers, e-commerce servers, transaction systems, application development tools, and new speech-based technologies – used to transform business into e-business for customers worldwide. Most of these technologies fall under the brand umbrella of WebSphere, IBM's e-business infrastructure platform.