SYS-CON MEDIA

2004: LOOKING AT THE YEAR AHEAD PAGE 4

BEA WebLogic DEVELOPER'S JOURNAL

JANUARY 2004 - Volume:3 Issue:1

weblogicdevelopersjournal.com

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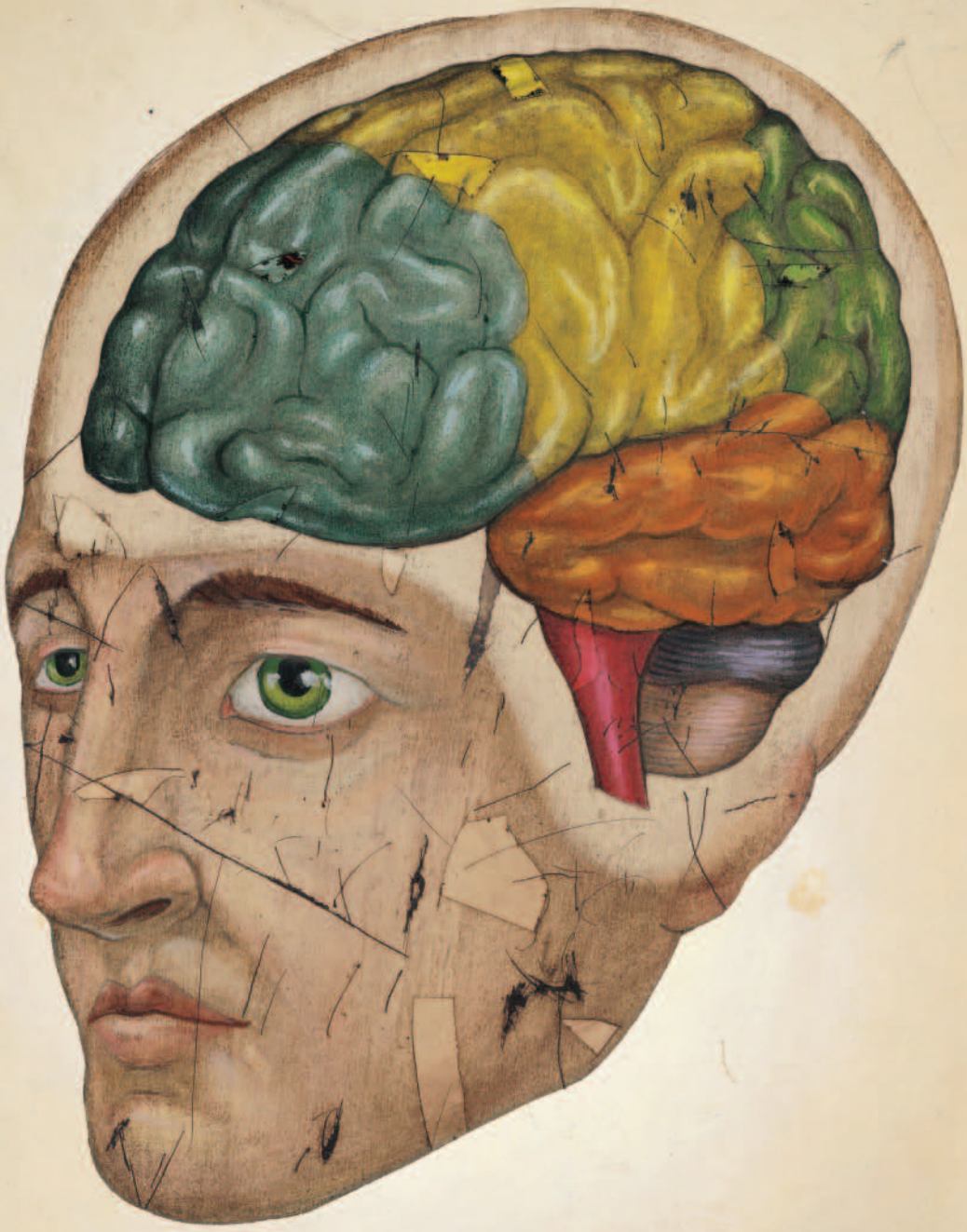
Configuring BEA WebLogic 8.1 JDBC Connectivity

Ajay Vohra & Deepak Vohra 6



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Predictions, **Predictions...**

BY JOE MITCHKO

The start of a new year is traditionally a time when we reflect on where we've been for the past year, and what we hope for the coming year. Magazine editors take this opportunity to take part in an age-old ritual, making predictions for the new year. What will the industry achieve during the upcoming year? What struggles and opportunities will we reflect on this time next year? To be honest, I don't believe too much in prediction making; for the most part none of it comes to pass exactly as we had thought. But, I have this inner urge to say something about the year to come, and how those in the BEA development community will fare over the next 12 months.

First, with the economic downturn over the past two years, we've seen the industry turned upside down, shaken violently, and dropped on its proverbial head. The economy seems to be picking up, along with IT budgets – good, you might say, for all of us. But, corporate IT spending is not the same as it was two years ago. To survive, firms have learned to become lean and mean and have become quite frugal when it comes to any kind of spending.

We've all felt the squeeze over the last year, whether it is the reluctance of a customer to buy our product, clients demanding bargain-basement consulting rates, or corporations outsourcing their work offshore. I believe this trend will continue over the next year. Whether or not it gets worse will be somewhat a matter of IT resource supply and demand.

But I believe our current problems go deeper than that. I believe we have come to a point where the time and effort required to develop quality software (i.e., doing it the right way) is grossly out of proportion with the amount of money people or corporations are willing to pay. Part of this thinking may be due to being indoctrinated on the Internet to believe that we are entitled to get software for free.

To compound things further, business applications for the most part are relatively short lived and often require regular updates to keep up with the rapid changes in business. It just doesn't make sense to pay exorbitant costs for something that depreciates so fast.

So here is my second prediction. In order to deal with the various funding and development cost pressures, the IT industry will be seeking software development solutions that enable developers to produce the most functionality for the dollar. It's not just core software development costs that are the issue. Whether we realize it or not, the amount of time developers are spending dealing with configuration and integration issues has increased over the past several years. Given today's technology, good configuration management practices are a key component of software development, where you literally have hundreds, if not thousands, of system components that have to fit together just right.

As for the third prediction, full-featured software IDE development products, such as BEA WebLogic Workshop with its ability to produce a lot of functionality in a fraction of the time and handle a good portion of your configuration and deployment concerns, will come into their own and be increasingly seen as a viable solution to the dilemma in which we find ourselves.

Enough with the predictions and on to some things of which I am a little more certain. Beginning with this issue, we have three new monthly columns for you to enjoy. First, for those of us who are inclined to studying blueprints all day, we have a column that will explore various architectural subjects related to WebLogic Server platform development. For those responsible for keeping the systems up and running, a new WebLogic Server Administrators column will provide monthly tips to help you do the job right. And finally, we have a column that deals strictly with support issues and what to do when things go awry.

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BEA WebLogic Developer's Journal (ISSN# 1535-9581) is published monthly (12 times a year)
Postmaster: Send Address Changes to
BEA WEBLOGIC DEVELOPER'S JOURNAL,
SYS-CON Publications, Inc.
135 Chestnut Ridge Road, Montvale, NJ 07645

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WEBLOGIC 8.1 JDBC CONFIGURATION WITH AN ORACLE 8.1.7 DATABASE

BY **AJAY VOHRA & DEEPAK VOHRA**

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This article describes the configuration of various JDBC-related features in the BEA WebLogic 8.1 Server. Although we use Oracle 8.1.7 as our example database management system (DBMS), the general concepts are easily transferable to other relational databases as long as the databases in question provide connectivity through JDBC.

Introduction

JDBC is a standard Java API that is used directly or indirectly by almost all J2EE applications that require database access. In BEA WebLogic 8.1, configuring JDBC connectivity consists of creating and configuring two main artifacts – JDBC connection pools and data sources. Related to these two principal artifacts are other secondary configurable artifacts, such as a Multi pool or a data source factory.

Connection Pool or Multi Pool?

Before we dive into how to create and configure a connection pool, we need to take a brief look at why anybody would need a connection pool.

If you didn't use a JDBC connection pool for access to a database, in order to establish a connection to a database you would need to follow these steps:

- Load a JDBC driver class.
- Create an instance of a JDBC driver and register it with a driver manager.
- Obtain a connection to a database from the driver manager by supplying a database URL and other required parameters.
- Close the connection when done.

In contrast to this single-connection-at-a-time approach, a connection pool is an extant collection of database connections that may be recycled among multiple active J2EE applications. The connections in a connection pool are open and available for access. After an application has used a connection, the connection, instead of being destroyed, is returned to the connection pool and becomes available for other applications. By saving on the computing resources associated with the frequent setup and tearing down of database connections, a connection pool enhances database access performance, especially during peak load.

A multi pool is a collection of connection pools. The main purpose for multi pools is to increase availability and load balancing across a set of connection pools.

Why a Data Source?

A data source is a Java Naming and Directory Interface (JNDI) object that provides access to a connection pool or a Multi Pool. A connection pool or a multi pool is required to configure a data source. A data source may be configured with transaction attributes. A nontransactional data source is for local transactions; a transactional data source is for distributed transactions.

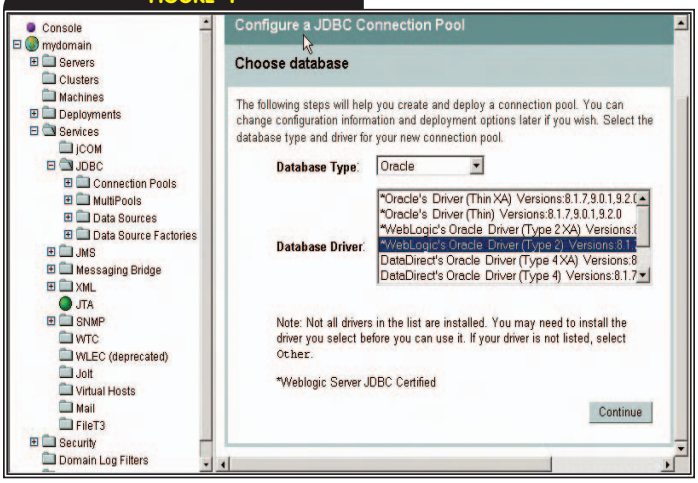
A data source encapsulates access to a database and hides the details involved in accessing a connection pool or a multi pool. In addition, a data source makes it easy to configure the transactional nature of a database connection.

A JDBC Data Source Factory is a JNDI object used by an enterprise application to get a connection from an application-scoped connection pool.

JDBC Drivers Setup

The JDBC drivers required to establish a connection between a WebLogic Server and a DBMS are of two types: Type 2 and Type 4. The Type 2 JDBC drivers require native libraries. For Type 2 JDBC drivers add the path to the WebLogic shared library (or dynamic linked library) directory – <WEBLOGIC>\server\bin\oci817_8 – and the Oracle client library directory – <ORACLE>\bin – to the beginning of the system <PATH> variable.

FIGURE 1



JDBC connection pool configuration Frame in the Administration Console

TABLE 1

Oracle Driver	Driver Classname	URL
WebLogic's Oracle Driver (Type 2)	weblogic.jdbc.oci.Driver	jdbc:weblogic:oracle
WebLogic's Oracle Driver (Type 2XA)	weblogic.jdbc.oci.xa.XADataSource	jdbc:weblogic:oracle
Oracle's Driver	oracle.jdbc.driver.	jdbc:oracle:oci8:@<database>
(OCI Type 2)	OracleDriver	
Oracle's Driver (OCI XA Type 2)	oracle.jdbc.xa.client.OracleXADataSource	jdbc:oracle:oci8:@<database>
Oracle's Driver (Thin Type 4)	oracle.jdbc.driver.OracleDriver	jdbc:oracle:thin:@<host>:<port>:<database>
Oracle's Driver (Thin XA Type 4)	oracle.jdbc.xa.client.OracleXADataSource	jdbc:oracle:thin:@<host>:<port>:<database>

Driver classname and URL settings

The WebLogic 8.1 Server is installed in the <WEBLOGIC> directory. The Oracle 8.1.7 database is installed in the <ORACLE> directory. <PATH> is the WebLogic Server Path variable.

For both Type 2 and Type 4 drivers, relevant JDBC driver classes are required in the WebLogic Server CLASSPATH to configure a connection pool or a data source. Add the <ORACLE>\JDBC\lib\classes12.zip file containing the Oracle Type 2 JDBC driver classes to the <CLASSPATH> variable in the <domain>/startWebLogic script file.

- <CLASSPATH>: WebLogic Server Classpath variable
- <domain>: WebLogic Server Domain directory

Configuring a JDBC Connection Pool

Now we'll look at how to create a connection pool and configure the various parameters associated with a it.

To create a JDBC connection pool, right-click on the JDBC>Connection Pools node in the Administration Console and select "Configure a new JDBC Connection Pool".

A Configure a JDBC Connection Pool frame is displayed. Select a Database Type – Oracle for an Oracle database. Select a Database Driver and click the Continue button (see Figure 1).

A Define Connection Properties frame is displayed. In the frame, specify a Database Name, a Database User Name, and a Password. Click on the Continue button.

A Test DataBase Connection is displayed. In the frame, specify values for the Driver Classname, URL, and Properties fields. Driver Classname is the class name of the driver used to get a database connection. URL is the database URL used to get a connection. Properties is the list of properties to create a connection.

The Driver Classname and URL settings for the different Oracle JDBC drivers are specified in Table 1.

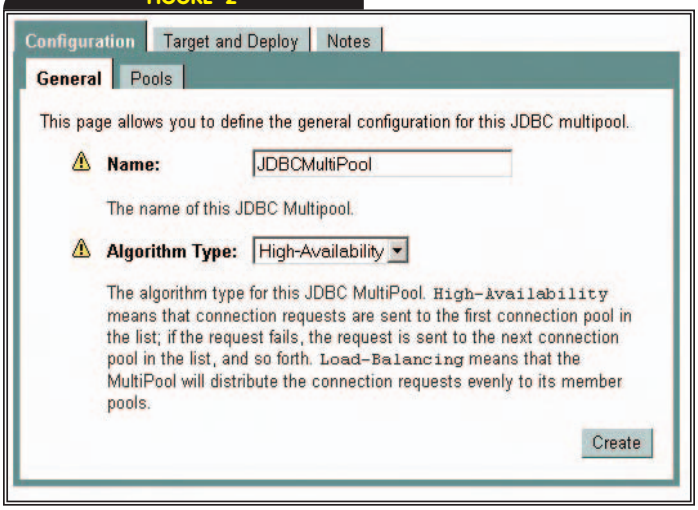
In the URL setting, <host> is the HOST value specified in the <ORACLE>/network/ADMIN/tnsnames.ora file, <port> is the PORT value specified in the tnsnames.ora file, and <database> is the database instance name.

In the Properties text box the settings are:

```
user=<user>
server=<database>
```

<user> is the user name specified to log in to the Oracle database. <database> is the Oracle database instance name. The server property should not be specified if an Oracle thin (Type 4) driver is used.

FIGURE 2



Multi Pool Configuration frame in the Administration Console.

Click the Test Driver Configuration button to test the JDBC Connection Pool. If the driver configuration test is successful a "Connection successful" message is displayed. If the driver configuration has an error, an error message is displayed.

A Create and Deploy frame is displayed. In the frame, select a server to deploy the connection pool, and click the Create and Deploy button to create and deploy a JDBC connection pool. A connection pool is created and deployed on the selected server. It may be deployed on more than one server. A <JDBCConnection Pool> node is added to the JDBC>Connection Pools node in the Administration Console. <JDBCConnection Pool> is the connection pool name.

To modify the JDBC Connection Pool configuration, click on the JDBC>Connection Pools><JDBCConnection Pool> node and select the Configuration tab. To modify the target server select the Target and Deploy tab. Select a target server and click the Apply button. Select the Connections tab to configure the JDBC Connections properties.

Connection Properties

- ***Initial Capacity:*** Number of database connections created when the connection pool is created.
- ***Maximum Capacity:*** Maximum number of connections in the connection pool.
- ***Capacity Increment:*** Increment by which the connection pool capacity is increased within the limit of maximum capacity.
- ***LoginDelay:*** Number of seconds to delay before creating each physical database connection.
- ***Allow Shrinking:*** Set to true to enable a connection pool to reduce the capacity to InitialCapacity if additional connections are not being used.
- ***Shrink Frequency:*** Number of seconds to wait before reducing the connection pool capacity. If Shrink Frequency is set to true, Allow Shrinking must also be set to true.
- ***Test Frequency:*** Number of seconds between database connection tests. After every Refresh Period interval, unused database connections are tested using TestTableName if a TestTableName is set.
- ***Test Reserved Connections:*** If selected, the server tests a connection before giving it to the client.
- ***Test Created Connections:*** If selected, a JDBC connection is tested after being created and before being added to the list of available connections in the JDBC connection pool.
- ***Test Released Connections:*** If selected, the server tests a connection before returning it to the Connection Pool.
- ***Test Table Name:*** Database table name to be used for JDBC connection testing. Test Table Name is required if Test Frequency is specified, and Test Reserved Connections, Test Created Connections, or Test Released Connections is selected.

Select the Apply button after configuring the Connections frame.

Configuring a JDBC Multi Pool

A multi pool is a collection of connection pools. Configure connection pools for the multi pool before creating a multi pool. To create and configure a new multi pool right-click on the JDBC>Multi Pools node in the Administration Console and select Configure a New Multi Pool.

A Configuration frame is displayed. In the Multi Pool Configuration frame specify Algorithm Type and select the Create button. If Algorithm Type is set to "High availability", all available connections in one pool are used before connections in another pool are used. If Algorithm Type is set to "Load balancing", the multi pool distributes connection requests evenly to all the connection pools in the multi pool (see Figure 2).

Select the Pools tab and in the Pools frame select Connection Pools to be added to the Multi Pool. Click the Apply button. The selected connection pools are added to the multi pool. The connection pool used in a connection is selected based on the Algorithm Type.

Select the Target and Deploy tab and in the Target and Deploy frame select a target server. Click the Apply button. A multi pool may be deployed on more than one server. A <Multi Pool> node is added to the JDBC>Multi Pools node in the Administration Console. <Multi Pool> is the multi pool name.

Configuring a JDBC Data Source

A data source is a JNDI object to access a connection pool or a multi pool. A connection pool or a multi pool is required to create a data source. A connection pool is required to create a transactional data source. Create a Connection Pool or a Multi Pool before creating a Data Source.

To create and configure a data source right-click on the JDBC>Data Sources node in the Administration Console and select Configure a new JDBCTxData Source.

A Configuration frame is displayed. Specify the field settings in the Data Source Configuration frame. JNDI Name is the JNDI path of the Data Source.

Select Honor Global Transactions to create a transactional (Tx) Data Source. If Honor Global Transactions is not selected, the data source created is a non-Tx data source (see Figure 3).

A Connect to Connection Pool frame is displayed. In the Pool Name field select a JDBC Connection Pool from the available list of connection pools and click the Continue button. The data source is connected with the selected connection pool.

A Target the Data Source frame is displayed. In the frame select a target server and click the Continue button. The data source is deployed on the selected server but may be deployed on more than one server. A <JDBCData Source> node is added to the JDBC>Data Sources node in the Administration Console. <JDBCData Source> is the data source name. To modify the data source configuration, click on the JDBC>Data Sources><JDBCData Source> node in the administration console. Select the

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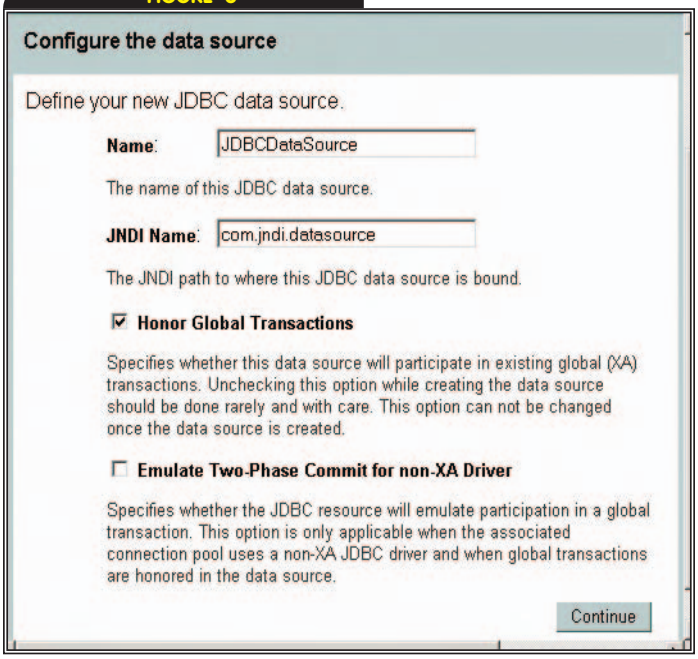
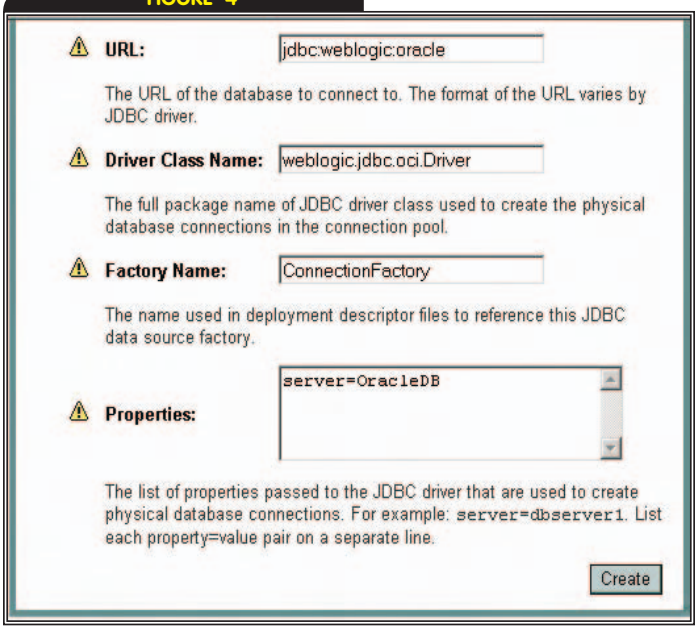
FIGURE 3



Data Source Configuration Frame in the administration console

FIGURE 4



Data Source Factory Configuration Frame

Configuration tab. To enable fetching of multiple rows for each Result Set from the server to an external client in one server access, select Row Prefetch Enabled and specify a Row Prefetch Size. To enable global transactions for a non-XA JDBC driver, select Emulate Two-Phase Commit for non-XA Driver, and select Honor Global Transactions. To modify the target server for the data source select the Target and Deploy tab. Select a target server and click the Apply button.

Comparison of Data Source and Tx Data Source

A data source is a Tx Data Source if Honor Global Transactions is selected in the data source configuration. A data source is used with a connection pool or a multi pool. A Tx data source is used with a connection pool. A data source is used for local transactions. A Tx Data Source is used for distributed transactions.

Tx Data Source should be used instead of a data source for:

- Container-managed persistence entity beans
- Access of multiple resources during a transaction
- Multiple database updates within a single transaction
- Use of the same connection pool on multiple servers

Configuring a JDBC Data Source Factory

A JDBC Data Source Factory is a JNDI data source resource. A Data Source Factory is used by an enterprise application to get connections from an application-scoped connection pool.

To create and configure a JDBC Data Source factory, right-click on the JDBC>Data Source Factories node in the Administration Console and select Configure a new JDBCDataSourceFactory.

A Configuration frame is displayed. In this frame specify values for the URL, Driver Class Name, Factory Name, and Properties fields and click on the Create button (see Figure 4).

A <JDBCData Source Factory> node is added to the JDBC>Data Source Factories node in the Administration Console. <JDBCData Source Factory> is the Data Source Factory name. To use the <JDBCData Source Factory>, restart the server.

JDBC Configuration and Server Performance

BEA's recommendations for the different JDBC configuration settings for WebLogic Server follow.

To enhance server performance in production mode:

- Set InitialCapacity value equal to the MaxCapacity in the JDBC Connection Pool Configuration. If the Initial Capacity value is less than MaxCapacity, the server creates additional database connections when load is increased. Under increased load, resources must be allocated to create additional database connections when resources are also required to complete JDBC client requests.
- Set MaxCapacity equal to the number of concurrent client sessions that require JDBC connections: To determine the concurrent client sessions in a Connection Pool, select the connection pool node. Select the "Monitoring" tab. The value in the "Active Connections" column is the average number of concurrent client sessions. The value of Connections High is the highest number of concurrent client sessions. The MaxCapacity value may be modified after deploying an application and monitoring the active connections.
- Select Row Prefetch Enabled in Data Source configuration when an external client accesses a database using JDBC through WebLogic Server: Row prefetching enhances performance by fetching multiple rows in one server access.

Conclusion

Following the procedures outlined here, a WebLogic developer should be able to configure a BEA WebLogic 8.1 Server with an Oracle 8.1 database. Configuring other databases would be similar to Oracle 8.1 Add the zip/JAR file containing the driver classes for the corresponding database to the CLASSPATH variable, and specify the corresponding connection URL and driver classname in the JDBC Connection Pool configuration.

Resources

- *Programming WebLogic JDBC:* http:edocs.bea.com/wls/docssl/jdbc

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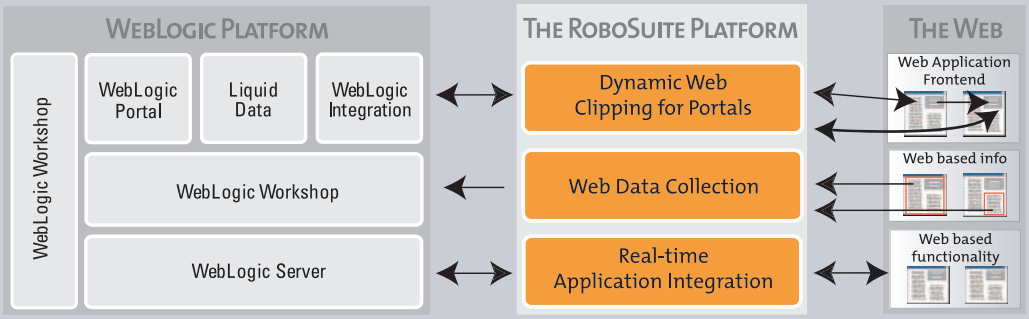

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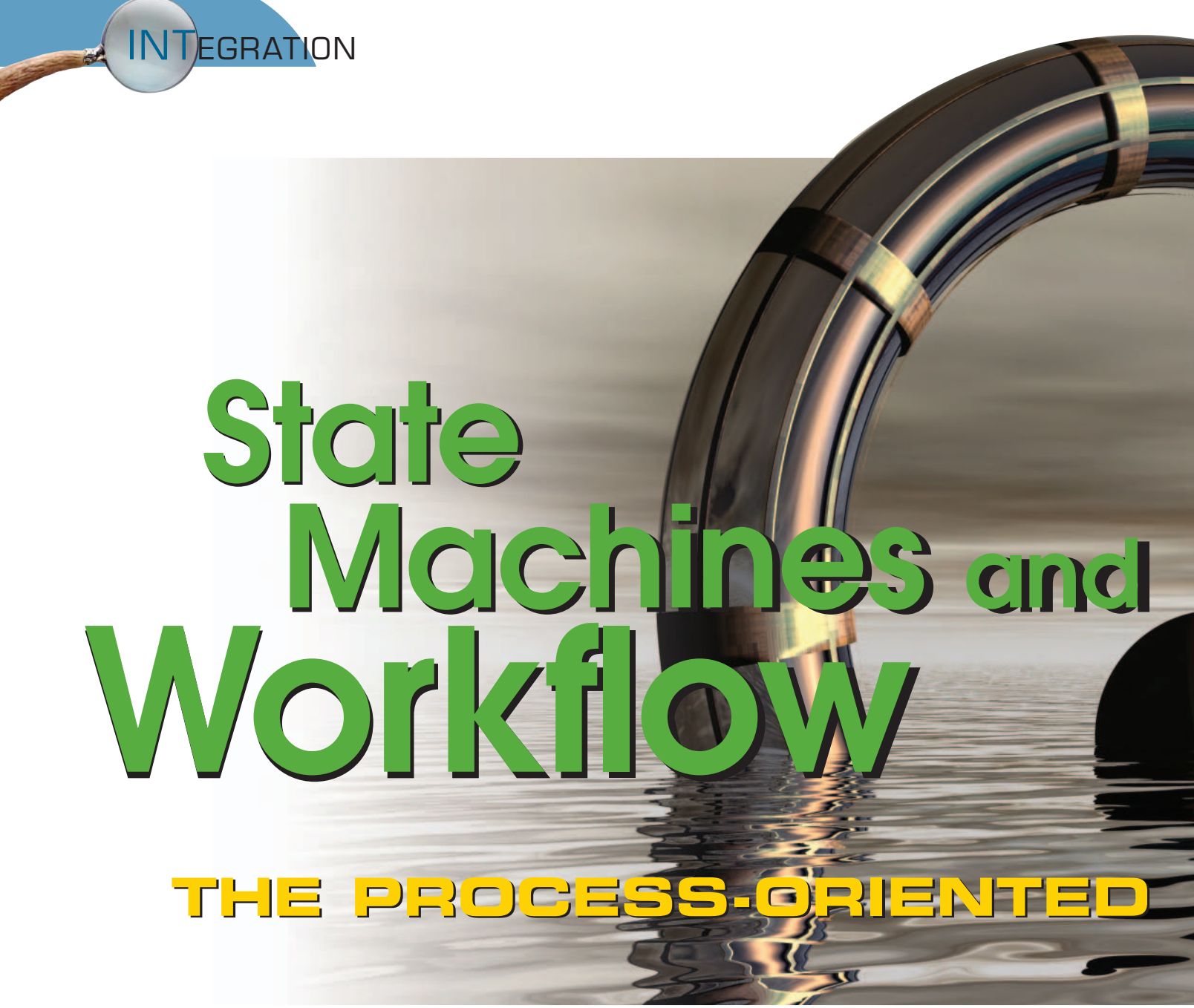

State Machines and Workflow

THE PROCESS-ORIENTED

BY **MICHAEL HAVEY**

AUTHOR BIO...

Michael Havey is a BEA consultant with eight years of industry experience, mostly with application integration. He is also a father, poet, philosopher, and sports fan.

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The state machine is one of the most successful ideas in the history of computing. Alan Turing built a model of computability around the concept, and in doing so became the father of computer science. Mealy, Moore, Harel, and other theorists expanded the idea, influencing engineers of digital logic, real-time, and embedded systems whose designs are peppered with state machines and diagrams.

The concept of the state machine is also a natural fit for many contemporary enterprise applications, particularly those that are process-oriented. The distinguishing characteristic of a process-oriented application is its movement over time from state to state, or put differently, its progression from milestone to milestone to an ultimate goal. An application that manages the processing of an insurance claim is a typical example: the claim, over its lifetime, is passed from one person to another in a succession of approvals, and is defined at all times by how far it has gotten. But not all enterprise applications qualify. For example, in an automated teller machine (ATM), which lets users query their account balance, withdraw cash, deposit checks and cash, and pay bills, any sense of process is extremely short-lived and inessential; an ATM is an online transaction processor, not a process-oriented application.

The process that defines the insurance application is described by the state diagram shown in Figure 1.

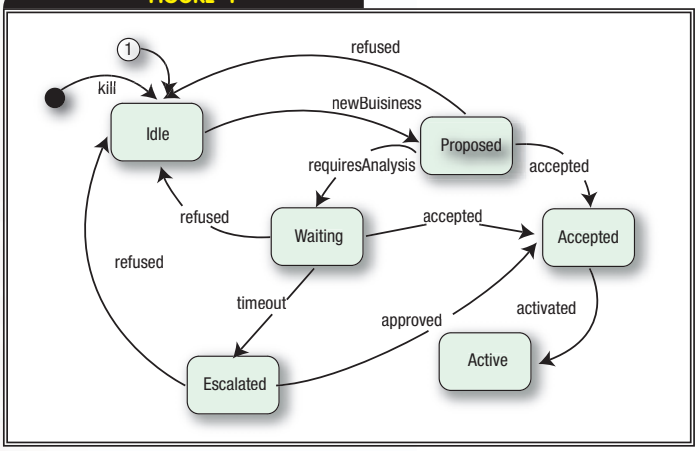
The claim is initially idle. It enters the proposed state when it is first received into the claims department. In that state, it is examined

BPM's design tool looks like what the business analyst has in mind or has drawn on paper. The insurance example looks like Figure 2 in WebLogic Integration 8.1 and Figure 3 in version 7.0.

The steps are the following:

1. The workflow is started when a claim is received.
2. The workflow is always waiting for a kill event. If that event occurs, stop claim processing no matter what step the workflow is at.
3. A claim is initially assigned for evaluation to a person or role.
4. If the initial evaluator refuses the claim, the workflow stops.
5. If the initial evaluator deems further analysis needs to be done, the claim is assigned to another person or role for analysis.
6. If the initial evaluator accepts the claim, the claim is assigned to a person or role for activation.
7. If the person analyzing the claim refuses it, the workflow stops.
8. If the person analyzing the claim accepts it, the claim is assigned to a person or role for activation.
9. If time expires on the person analyzing the claim, the claim is assigned to a person or role for escalation.
10. If the escalator refuses the claim, the workflow stops.

FIGURE 1



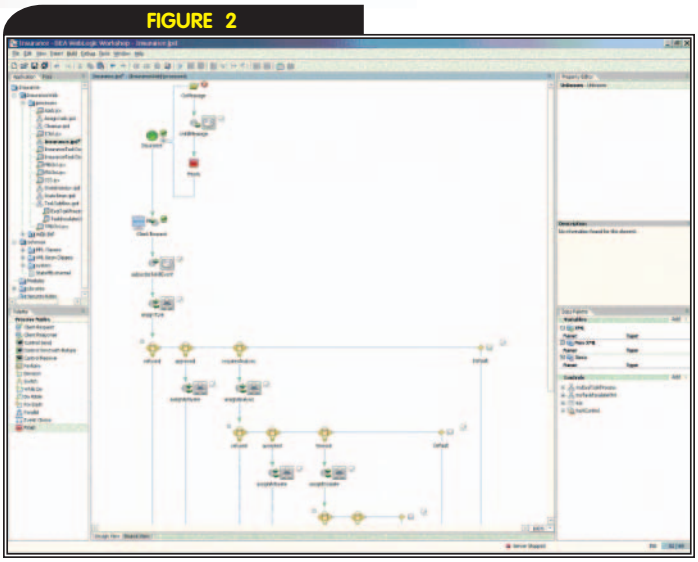
State diagram for insurance claim (adapted from the article "Insure Yourself with XML!" by Philippe Fontaine [www.infoloom.com/gca confs/WEB/paris2000/S25_04.htm])

by an analyst and can be accepted, refused, or passed on for further analysis, at which point it enters the waiting state. In the waiting state, the claim is further analyzed and is ultimately accepted or refused. A time limit for analysis is set; if the claim waits too long it is escalated to a supervisor, who examines the claim and accepts or refuses it. An accepted claim is examined by another analyst, who must activate it, at which point the claim enters the active state. At any point (in other words, in any state) a claim can be killed, which takes it back to idle.

Workflow and State Machines

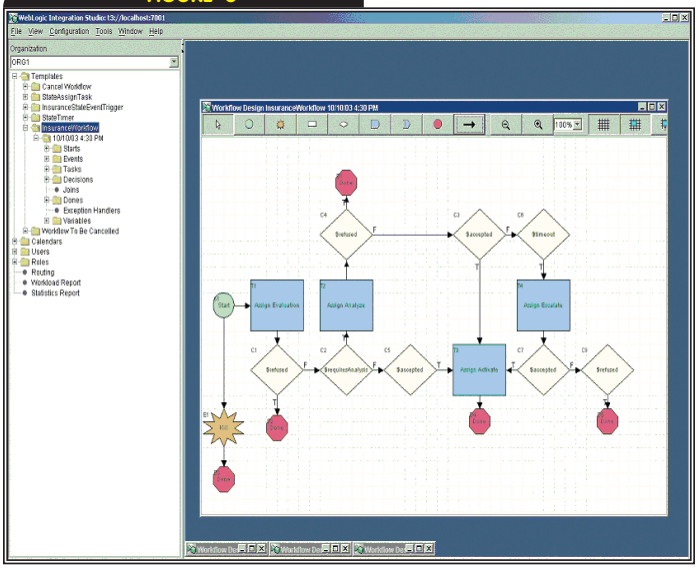
The popularity of workflow application frameworks, such as the Business Process Modeler (BPM) component of BEA WebLogic Integration, proves not only that process-oriented applications abound, but also that companies are willing and eager to use high-level modeling languages to develop these applications. Besides state machines, workflow technology is an obvious implementation choice for business processes because a workflow is often the most similar representation of the process. That is, a workflow in

FIGURE 2



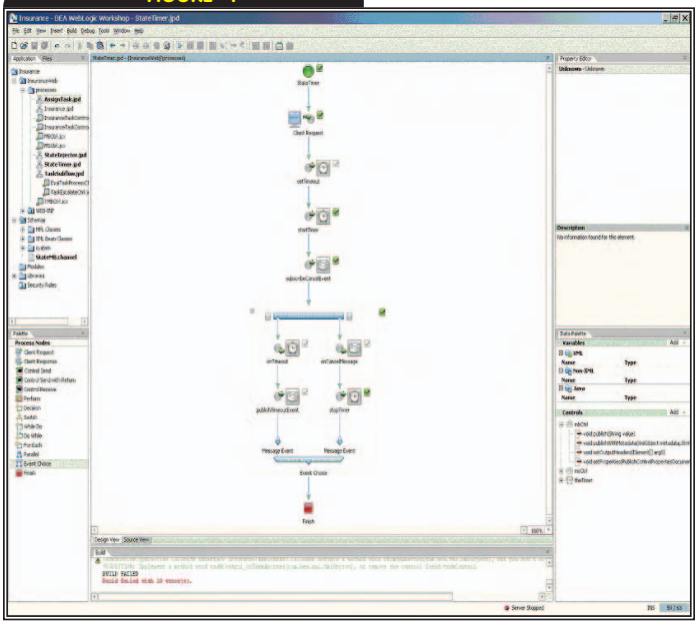
WebLogic Integration 8.1 insurance workflow

FIGURE 3



WebLogic Integration 7.0 insurance workflow

FIGURE 4



WebLogic Integration 8.1 timer flow

TABLE 1

EVENT	ACTION
"newBusiness" transition is executed	Start BPM workflow that assigns task "evaluation" to a user.
"accepted' transition is executed	Start BPM workflow that assigns task "activate" to a user.
"requiresAnalysis" transition is executed	Start BPM workflow that assigns task "analyze" to a user.
"escalated" state is entered	Start BPM workflow that assigns task "escalate" to a user.
"refused" transition is executed	Start BPM workflow that processes cleanup of claim.
"waiting" state is entered	Start BPM workflow that sets timer on wait state.
"waiting" state is exited	Send event to BPM timer workflow to cancel timer.
"kill" transition is executed	Start BPM workflow that processes cleanup of claim.

Action class behaviors

11. When the person activating the claim does so, the workflow stops.

Workflow is *procedural:* it describes how a process should run. By contrast, the state machine representation of a process is *declarative*; to define a process is to declare its states and transitions. There are advantages and disadvantages to each approach. For example, workflow is easier for a business analyst to understand, but being procedural it requires more code and is less compact than a state model. But workflow and the state machine are not mutually exclusive, and when used in concert, they can produce powerful solutions.

WebLogic Integration's BPM has four capabilities that are essential to a process-oriented application:

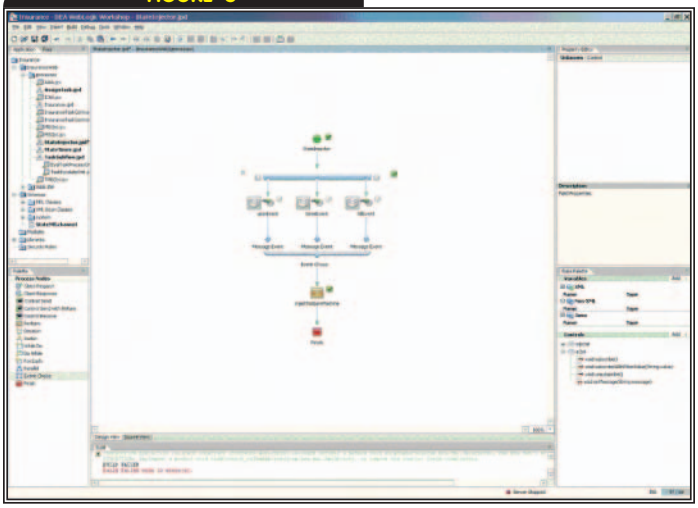
- ***Worklist:*** Human beings are often the key actors in a business process, not only as the source of events that drive the process, but also as participants in the actual processing. The BPM worklist enables a workflow to assign a work task to a user or role and track its progress.
- ***Integration:*** Besides human beings, external systems do much of the work in a process-oriented application. For example, in an insurance application ADP is called to cut a check for payment on the claim. Integration is what WebLogic Integration is all about.
- ***XML:*** Information exchanged between workflow and external systems or users is usually in the form of XML documents. BPM provides abundant XML facilities, including transformations and the ability to listen for events satisfying XPath or XQuery expressions.
- ***Events and timers:*** Process-oriented applications live a long time but spend most of their time asleep. Events and timers wake them up, whereupon workflows do work and possibly change state. Events and timers are built into BPM.

When these features are incorporated into an enterprise state machine framework, the result is a powerful synthesis that is ideal for process-oriented application development. The pieces of this solution are the following:

1. A state machine framework, consisting of:
   - *State model:* A model is a set of states and transitions, expressed in an XML document.
   - *Actor database:* An actor is an entity that has state. The state of the actor is persisted to a database by the state machine.
   - *State machine engine:* The engine injects events into an actor's state model and updates state accordingly. It also calls user-defined action classes when a state is entered or exited or a transition occurs.
   - *Action classes:* User-defined Java classes that respond to the entry or exit of a state or the execution of a transition for an actor in a given state model.
2. A BPM workflow that receives an event and injects it into the state machine.
3. A BPM workflow that sets a timer and injects a timeout event into the state machine when the timer expired.
4. A BPM workflow that is called by a state action to assign a worklist task or interact with an external system.

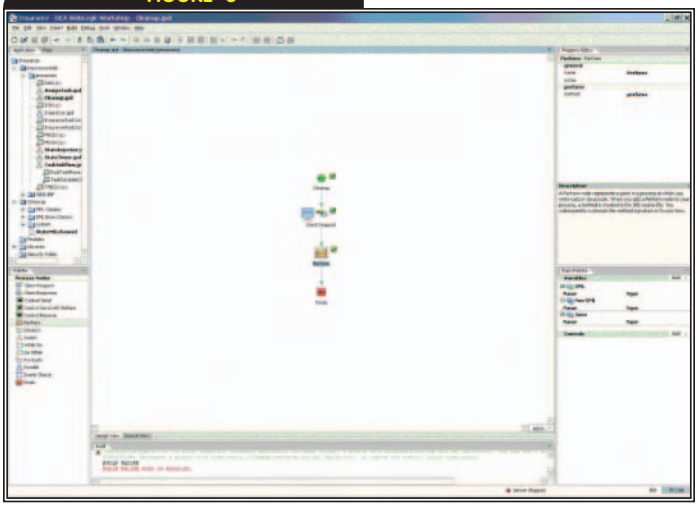
The insurance example is a perfect example. The state model for the application, a formalization of Figure 1, is shown in Listing 1. The XML indicates that there are seven states (e.g., "top", "idle", "proposed", "accepted") and multiple transitions (such as "approved" from the state "escalated" to the state "accepted").

FIGURE 5



WebLogic Integration 8.1 task flow

FIGURE 6



WebLogic Integration 8.1 Injector Flow

The "actor" to which this state model applies is an insurance claim. An actor is identified by a unique identifier, perhaps in this case a numeric claim ID. The action class has the behavior shown in Table 1.

The corresponding BPM workflows are as follows:

- ***Timer flow:*** Starts a timer for a specified interval. If the timer expires, the workflow fires an XML timeout event. This workflow also listens for a cancellation event that causes it to stop the timer. Figure 4 shows this workflow for WebLogic Integration 8.1.
- ***Task assignment flow:*** Assigns a task to a given user or role and waits for the user's response. Based on the response, this workflow generates an XML event bound for the state machine. The WebLogic Integration 8.1 implementation is shown in Figure 5.
- ***State injector:*** All XML events bound for the state machine are intercepted by this workflow, which in turn calls the state machine via its API to inject an event. Figure 6 shows the injector workflow in WebLogic Integration 8.1
- ***Cleanup:*** The cleanup workflow performs whatever steps are necessary to finalize a claim, such as cutting a rejection letter or an acceptance letter with a check.

Conclusion

Process-oriented enterprise applications abound, and workflow toolsets, such as BEA WebLogic Integration's BPM, are viable and popular frameworks to develop them. However, the state machine approach is also valid, and has particular advantages when coupled with BPM. My next article will look at E-State, a reference implementation of an enterprise state machine framework that is meant to coexist with BPM.

Listing 1: Insurance state model in XML

```
<?xml version="1.0" encoding="UTF-8"?>
<StateModel namespace="Insurance"
clazz="examples.insurance.InsuranceAction">
  <State name="top" id="1">
          <Child id="2"/>
          <Child id="3"/>
          <Child id="4"/>
          <Child id="5"/>
          <Child id="6"/>
          <Child id="7"/>
          <InitialTransitionPoint/>
          <TransitionPoint><Point name="kill"
type="netp"/></TransitionPoint>
          <Transition name="init">
                    <Source><Point name="init" type="itp"/></Source>
                    <Dest><Point name="idle" type="state"/></Dest>
          </Transition>
          <Transition name="kill">
                    <Source><Point name="kill" type="netp"/></Source>
                    <Dest><Point name="idle" type="state"/></Dest>
          </Transition>
          <Transition name="newBusiness">
                    <Source><Point name="idle" type="state"/></Source>
                    <Dest><Point name="proposed" type="state"/></Dest>
          </Transition>
          <Transition name="refused">
                    <Source><Point name="proposed"
type="state"/></Source>
                    <Dest><Point name="idle" type="state"/></Dest>
          </Transition>
          <Transition name="requiresAnalysis">
                    <Source><Point name="proposed"
type="state"/></Source>
                    <Dest><Point name="waiting" type="state"/></Dest>
          </Transition>
          <Transition name="accepted">
                    <Source><Point name="proposed"
type="state"/></Source>
                    <Dest><Point name="accepted" type="state"/></Dest>
          </Transition>
          <Transition name="activated">
                    <Source><Point name="accepted"
type="state"/></Source>
                    <Dest><Point name="active" type="state"/></Dest>
          </Transition>
          <Transition name="accepted">
                    <Source><Point name="waiting" type="state"/></Source>
                    <Dest><Point name="accepted" type="state"/></Dest>
          </Transition>
          <Transition name="refused">
                    <Source><Point name="waiting" type="state"/></Source>
                    <Dest><Point name="idle" type="state"/></Dest>
          </Transition>
          <Transition name="timeout">
                    <Source><Point name="waiting" type="state"/></Source>
                    <Dest><Point name="escalated" type="state"/></Dest>
          </Transition>
          <Transition name="approved">
                    <Source><Point name="escalated"
type="state"/></Source>
                    <Dest><Point name="accepted" type="state"/></Dest>
          </Transition>
          <Transition name="refused">
                    <Source><Point name="escalated"
type="state"/></Source>
                    <Dest><Point name="idle" type="state"/></Dest>
          </Transition>
  </State>
  <State name="idle" id="2"/>
  <State name="proposed" id="3"/>
  <State name="accepted" id="4"/>
  <State name="active" id="5"/>
  <State name="waiting" id="6"/>
  <State name="escalated" id="7"/>
</StateModel>
```

Wlshell is a tool designed specifically for WebLogic administrators. It combines the flexibility of a scripting language with the full control provided by the JMX interface. It is, therefore, a natural environment for the systems administrator. The units of work of the JMX specification – the Management Beans, or MBeans – are presented in wlshell in the familiar form of the file system and they look like files organized into directories and drive units. This user-friendly environment makes it easy to write scripts to automate daily administrative WebLogic tasks.

Admin Automation with wlshell

A CHANGE FROM TRADITIONAL SCRIPTING LANGUAGES

BY PACO GOMEZ

AUTHOR BIO

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Administrative Tasks

Since the beginning of computing, automation has been one of the driving forces of innovation. A couple of examples are the adding machine developed by Blaise Pascal and the punch-card tabulator for the U.S. Census built by Herman Hollerith.

Today, and in a more modest scenario, BEA WebLogic administrators have to face repetitive tasks similar to those just described in the sense that they are candidates for automation. These administrative tasks can be classified in two categories: configuration and monitoring.

A typical configuration task is the deployment of a new application on production servers. In order to deploy the application, it might be necessary to create, configure, and target services this application could rely on, like JDBC connection pools, data sources, JMS messaging servers, and JMS message queues, to name some resources. If the production system contains several WebLogic servers and domains, then the process could be repeated several times, maybe with some differences in parameters like server name and address. Automating this task will produce clear benefits over performing the same task manually using the administration console: the WebLogic administrator will be more productive by doing more in less time, and the possibility of making configuration mistakes will be minimized. In some organizations there are specific and strict regulations about how to roll out applications. In these cases, to automate is more than a nice-to-have practice, it is enforced by law. This is, for example, the case of some companies in the financial and pharmaceutical sectors. In these cases, every application deployment must be performed through an automated process that's documented, repeatable, and auditable.

Another task frequently performed daily by an administrator is supervising the status of servers and services. An administrator might be interested in monitoring the servers in a domain to see if they are active and to check the utilization level. In the case of services, some interesting metrics are the current database connections and the status of the JMS servers.

Administration Using Scripts

Traditionally, scripting languages are the tool of choice to automate administrative tasks, like the UNIX shell. Some of the more radical system administrators say "real administrators don't click." This is a strong statement but it might be telling us that graphical-based tools have some limitations when it comes to task automation. Graphical tools might also lack the level of granularity a professional administrator demands for advanced custom control.

The JMX specification (Java Management eXtensions), on the other hand, provides the right level of detail and control over the systems, but it provides a programmatic interface, a Java API. Experience also tells us "real administrators don't compile code," paraphrasing the previous statement. In reality this means that the power and level of detail of JMX is not directly available to administrators, who aren't necessarily developers. The programming interface lacks the flexibility, dynamism, and conciseness of an interpreted environment like that provided by scripting languages. Is there any way to reconcile both terms? Yes, there are several alternatives. In the remainder of the article, I'll analyze one of them, wlshell, and I'll look at some examples of how to automate some typical administrative tasks.

Creating Services

In the first example I'll create, configure, and

start three WebLogic servers. I'll also create three JMS messaging servers, with three message queues each, and deploy the JMS servers on the WebLogic servers.

The first three lines of Listing 1 define the variables that allow the shortening of commands in the rest of the script. The first for loop creates three WebLogic servers, using a combination of the name and the index to produce servers with the names "s1", "s2" and "s3". The listen port is also configured based on the index variable, creating the integer values "7101", "7201", and "7301". wlshell supports two syntaxes for variables, $var and ${var}. The first one is more succinct and is good for interactive typing. The second notation should be used to clearly mark the end of the variable name and avoid any possible mistakes. The last line in the loop starts the server, which assumes the Node Manager is already up and running.

The next loop creates three JMS servers and three message queues for each JMS server using a nested for loop. The "addTarget" MBean operation is used at the end of the loop to target the server to the corresponding WebLogic server.

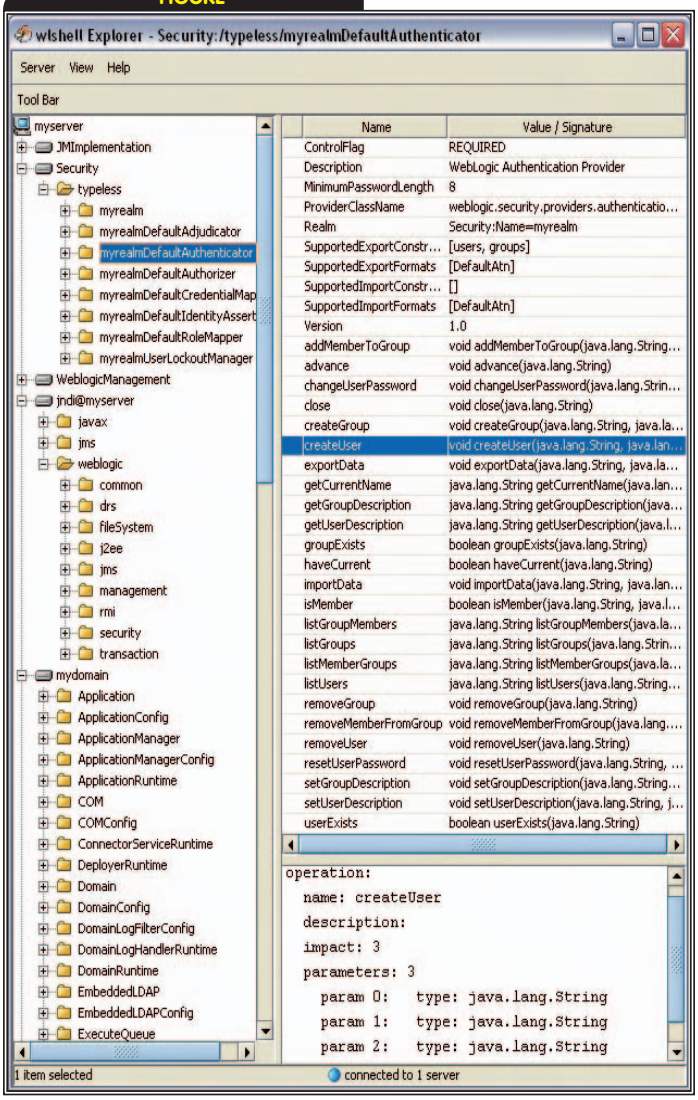
Finally, the configuration is explicitly persisted on the config.xml file, the default configuration repository. This script can be saved on a file to be executed later in batch mode with wlshell with the "read" command or as a start parameter with the "-f" flag, as shown here.

```
wlsh -f listing1.wlsh
```

```
read listing1.wlsh
```

Every BEA WebLogic administrator will probably understand immediately the benefits of using a script like this, especially compared to making configuration changes manually with the Web-based console or writing a Java program that uses JMX. The script presented above is relatively easy to read and understand at a first glance, prevents unintended errors, and saves time that can be used to work on more creative tasks.

FIGURE



wlshell Explorer displaying Security MBeans, JNDI tree and other MBeans.

Offline Configuration

Another new feature of wlshell version 2 is its ability to configure a WebLogic domain when the administration server is not running. This new characteristic creates new and exciting possibilities. We can now configure a domain in offline mode, very much like in the online case, just by using the "connect" command with the name of the "config.xml" file. In this case, the protocol for the connection has the keyword "file" to indicate that it is an offline type connection. We also need to check that the server is not running, so there is only one process making changes to the file.

In offline mode configuration, wlshell reads the config.xml file and presents a directory and file structure very similar to the online mode. All the commands available in the online connection are also available offline, so it is possible to navigate, create, set up, and remove servers, services, and applications. Listing 2 is an example of server configuration to increase the output information displayed on the console.

Once the config.xml file is modified, the administration server can be started with the new configuration. Changes made through wlshell on the config.xml are consistent with the document structure; therefore, the file is always valid. Offline mode is also useful for prepackaging a domain configuration without an administration server, and then distributing the configured package to another environment (testing, production, etc.).

Security Configuration

An important part of systems administration is security, specifically the management of users and groups. BEA WebLogic Security is completely managed through JMX MBeans, and as a result, totally available through wlshell, where administrators can write security management scripts. Within the default settings, the security MBeans are registered under the "Security" domain, without specifying any particular type. wlshell is capable of handling these MBeans with no type and gathers them under a directory named "typeless". Figure 1 shows the wlshell Explorer displaying the Security MBeans. It displays the attributes and operations of the "myrealmDefaultAuthenticator" Security MBean on the right pane. The authenticator MBean is responsible for user authentica-

tion and provides operations to manage users and groups. Using these methods, administrators can write scripts to create users in batch mode, assign users to groups, and change the user password. The following code snippet shows how to use the "createUser"operation to create a new user.

```
Security:
cd /typeless/myrealmDefaultAuthenticator
invoke createUser pgomez password "WebLogic
Account for Paco Gomez"
```

Monitoring

WebLogic Runtime MBeans provide a detailed view of the different subsystems of the application server. wlshell makes them easier to access. The "get –r <interval> attribute(s)" command iteratively displays the value of one or more MBean attributes. Sometimes it could be necessary to display information based on the value of a particular MBean attribute or a particular condition. In those cases it might be necessary to write a small script to customize the output. Listing 3 illustrates this point. The script is flexible enough to print the state of the servers configured in the domain without knowing in advance the name or number of them.

The script generates the following output for a particular domain configuration:

```
Mon Nov 10 21:59:47 GMT-06:00 2003
s1 7101 RUNNING 5899744
s2 7201 not running n/a
s3 7301 RUNNING 5682584
```

Summary

Some automation examples have been presented in this article. They illustrate how to write wlshell scripts to automate administrative tasks for configuration and monitoring. This approach provides clear advantages over other methods, improving productivity and legibility, and reducing the chances of committing configuration mistakes. You can find more administrative scripts at the wlshell home page.

References

- ***wlshell home page:*** www.wlshell.com
- ***wlshell scripts catalog:*** www.wlshell.com/scripts
- ***Scripting advocacy:*** http://home.pacbell.net/ouster/scripting.html

Listing 1

```
server = /Server/s
jms = /JMSServer/jms
queue = /JMSQueue/q

for $i in 1 to 3
  mkdir $server$i
  set $server$i/ListenPort (Integer) 7${i}01
  invoke $server$i/start
end

for $i in 1 to 3
  mkdir $jms$i
  for $j in 1 to 3
    q = $queue$i$j
    mkdir $q
    set $q/JNDIName "jms/"$q
    set $q/Parent $jms$i
  end
  invoke $jms$i/addTarget $server$i
end

invoke $savedom $DOMAIN
```

Listing 2

```
connect file:c:/bea/user_projects/domains/mydomain/config.xml
cd /Server/myserver
set StdoutDebugEnabled true
set StdoutSeverityLevel 64

invoke $savedom
disconnect
```

Listing 3

```
@ dir /Server
servers = $LAST

while true
  date
  for $s in $servers
    if $s == get /ServerRuntime/$s/Name
      state = get /ServerRuntime/$s/State
      mem   = get /JVMRuntime/$s/HeapFreeCurrent
    else
      state = "not running"
      mem   = "n/a"
    end
    print $s get /Server/$s/ListenPort $state $mem
  end
  sleep 10000
end
```

Forget something?

Post-launch is NOT the time to be verifying web applications.

The wild blue yonder of operational monitoring and management is extremely unforgiving. Which means that going live with the monitoring software you used in development is a great way to go dead—quickly! You simply can't support operations if your staff is drowning in details provided by development profiling tools and debuggers. **Let NetIQ cover your apps...with AppManager.**

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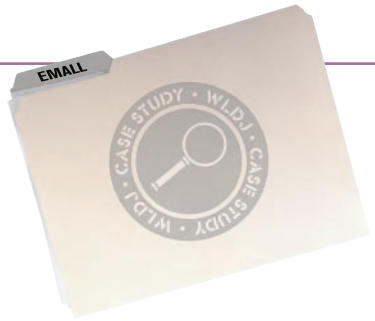

EMALL: Building an Integration Application

A SECURE, MISSION-CRITICAL APP IN ALMOST NO TIME

BY **ASHLEY BYRD & GIRISH GUPTE**

AUTHOR BIO

Ashley Byrd is a senior software engineer with the ICF Consulting software engineering team. He has 15 years of experience in application development, the last 7 in full life-cycle, object-oriented Internet systems primarily for the financial services industry.

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EMALL is a procurement portal for the U.S. Department of Defense. Defense and federal personnel use it to shop for items ranging from office supplies and equipment to weapons systems. The personnel have various levels of privileges to access classified catalogs and place orders.

They create "shopping carts" and submit their orders through a Web application. EMALL processes these orders via a rule engine with complex validation rules. After validating the orders, it sends requisitions to a supplier's system. Various authorized users can then track these orders.

Hundreds of vendors compete for this business. They have a huge item inventory with several million SKU numbers. Their systems need to be able to accept these requisitions from EMALL, and send the status of the orders back. An order may take anywhere from a few milliseconds to several months to process. EMALL handles classified and sensitive information, and large transactions. It needs to integrate with several systems that are geographically separated and based on a diverse range of distributed architectures and data communication technologies.

Architecture Choice

The EMALL project presented some interesting challenges. We needed a system that:

- Was highly secure, robust. reliable, and scalable
- Integrated sub-systems based on a wide range of technologies
- Handled long-lived transactions with complex paths of execution

In considering these challenges, we identified the following approach:

- Extensive use of XML as the data format between sub-systems
- Use of ebXML over HTTPS protocol as a transport between the sub-systems
- THe total decoupling of the implementations of various sub-systems
- Use of workflow-style asynchronous processing for long-lived transactions
- Use of J2EE for core components of EMALL, including the rule engine
- Use of SOAP, ebXML, and Web services to interact with external systems

The use of ebXML as a mode of communication between EMALL sub-systems was the key to our success. It provides important security and reliability features, including:

- Transport-level security via use of HTTPS
- Message-level security via use of digital signatures for protection against message tampering
- Support for nonrepudiation, including origin of the message as well as receipt of the message
- Reliable messaging by providing "once-and-only-once" quality of service

Choosing BEA WebLogic Platform 8.1

The EMALL project involved a high degree of complexity and stringent security and reliability requirements as well as a very aggressive time frame. The proper technology choice was key to that success. After careful consideration, we chose BEA WebLogic Integration 8.1. Some of the important factors that influenced our choice were:

- BEA WebLogic Integration 8.1 is built on BEA WebLogic Server/J2EE technology, which has proven to be highly stable, scalable, and secure.
- It supports long-lived business processes or workflows.
- It supports the ebXML specification versions 2.0 and 1.0.
- It easily integrates traditional EJB components with business processes and Web services.
- It includes a powerful IDE, BEA WebLogic Workshop, that allows rapid development. Workshop provides an easy-to-use interface, yet builds J2EE-compliant components that are deployed into BEA WebLogic Server.

Let's look at how we leveraged this platform to build EMALL (see Figure 1).

Configuring Trading Partners

BEA WebLogic Integration 8.1 includes a Web-based admin console that allows us to configure the trading-partner relationships for each entity participating in EMALL. The *Trading Partner Profile* includes the identity of the business entity, digital certificates associated with that entity, and ebXML bindings supported by that entity. The ebXML bindings include delivery semantics (e.g., once-and-only-once), a transport protocol (e.g., HTTPS), and URL end-points. These trading partners offer specific services that are defined by service profiles.

In our prototype, we defined three trading partners:

- ***WEB_UI:*** Represents the Microsoft .NET Web application used by the end users to submit and track orders.
- ***ICF:*** Validates the orders and sends requisitions to the vendors. This rule engine was developed using BEA WebLogic Platform 8.1. We created an "Application" icfApp in Workshop to represent this functionality.
- ***VENDOR:*** Represents one of the vendors that participate in EMALL.

Developing ebXML Participant Processes/Workflows

In the icfApp, we created a "Project" icfAppWeb. For each service offered by the ICF entity to other trading partners, we created one ebXML participant process. BEA WebLogic Workshop allows us to develop business processes that can be invoked by external trading-partner entities via ebXML messages. Workshop generates all the required transport-level components for handling the ebXML protocol. The developer needs to worry about only the application data. Workshop allows us to define the input and output of each business process. It creates a Java file with additional annotations (with a .JPD extension), for each process. Developers can put any business logic in the JPD, including calling EJBs, sending messages to MB-Broker channels or JMS destinations, invoking subprocesses, etc. When we build the application in Workshop, it creates the transport-layer components, such as servlets, that accept the HTTPS requests, handle the ebXML headers, extract the application data from the ebXML requests, and hand it over to the developer's code. The output of the JPD (the return value) is packaged into ebXML responses and returned to the caller by the transport-layer.

The WEB_UI application, which is based on Microsoft .NET technology, can invoke the ebXML participant JPD processes through the ebXML bindings defined in the trading-partner configuration.

WebLogic Workshop also allows us to create other processes, including those that can be invoked by sending messages on a channel, or via the Web services stack. We can also call one process from another, using the process control. The real implementation of "acceptCart.jpd" involves complex business logic, including XML data manipulation, rule-based validation, exception handling, and so on. Various tasks related to this JPD are performed synchronously or asynchronously as necessary. WebLogic Workshop allows us to create a process or workflow in the design-view of the JPD, define transactions, and implement complex business logic easily.

Using ebXML Controls

The business processes running on the ICF system also need to invoke ebXML services deployed on other trading partners. WebLogic Workshop allows us to use ebXML controls within the JPD files. The ebXML control is a Java interface generated by Workshop. This interface has methods that match the ebXML service provided by the remote trading partner service. The actual implementation class is generated by Workshop when you build the application. Therefore, the developer does not need to deal with the ebXML protocol stack and just calls the remote service via this interface. The ICF application invokes services from the VENDOR application through this mechanism. In our prototype, we simulated the VENDOR application through Business-Connect 8.1, a lightweight, ebXML-enabled server from BEA.

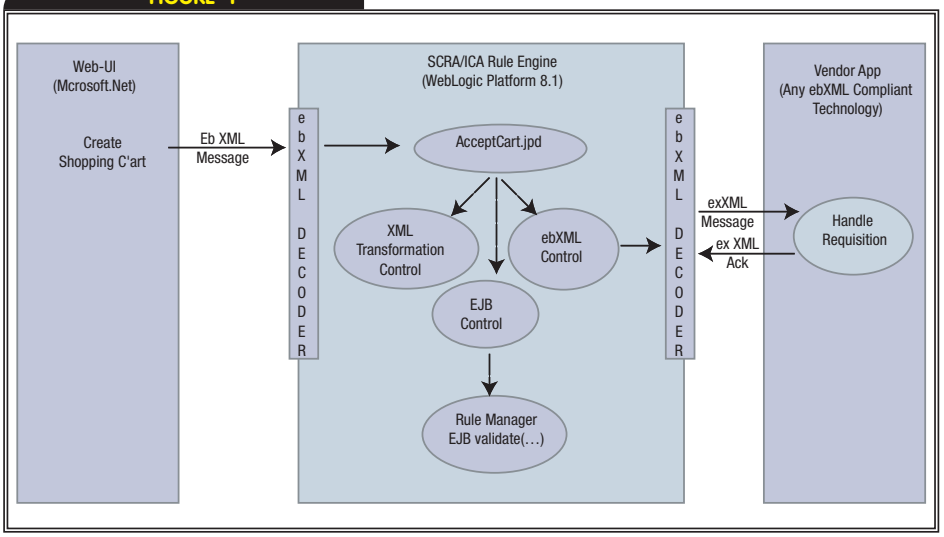
Handling XML Data

The WEB_UI application sends a shopping cart in the form of XML to the ebXML process in the ICF application. We created an XML Schema file using the XMLSpy tool bundled with WebLogic Platform. We then imported this Schema (XSD file) into the ICF Application. The WebLogic Workshop IDE generates Java classes that represent the XML types. Each class has get/set methods and Factory methods to parse Java strings, files, etc., into XML objects. These classes are available in the code for JPD files. We can define these types as input arguments or return values for the process. We then extract the fields from an XML type, or transform them into another XML type using the XQuery API. WebLogic Workshop provides an easy-to-use GUI interface for creating and editing XQuery expressions – available as Transformation Control methods. This allows us to develop applications quickly, without writing any low-level code.

Integrating EJBs into Workflows/Processes

Through WebLogic Workshop, we can create EJB controls that invoke the EJBs. The process is very straightforward.

FIGURE 1



How the platform works

– Continue on page 26

WORKSHOP AND PORTAL

BASIC FUNCTIONALITY OPENS A NEW WORLD

BY **KUNAL MITTAL**

AUTHOR BIO

Kunal Mittal is a consultant for implementation and strategy for Web services and services-oriented architectures. He has co-authored and contributed to several books on Java, WebLogic, and Web services.

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kunal@kunalmittal.com

BEA WebLogic Workshop is the single point of entry for developers to develop J2EE applications on the BEA platform. The WebLogic Workshop Platform Edition includes support for portal development on top of the standard WebLogic Workshop Application Developer Edition.

This article introduces you to the various aspects of portal development that are enabled through the WebLogic Workshop tool. I'll go over the basics to get you started with developing your portal application in BEA WebLogic Workshop 8.1.

Setting Up Your Environment

The first step is to create a platform domain using the Domain Configuration wizard. You can use all the default settings for now. Once you have a domain, you need to start WebLogic Workshop to create a Portal Application and a Portal Project. These are pretty straightforward steps and I will not cover them in detail in this article. You can always use the WebLogic Workshop help to guide you through this process.

Create a Portal Within the Portal Project

Right-click on the Portal project that you just created in the Application Window. Choose New->Portal. The Portal designer appears with a default header, body, and footer for a Portal Desktop. The body contains a page (see Figure 1).

You are now ready to start developing portal applications and deploying them to the Portal Server.

Customizing a Portal in Workshop

There are various steps to customizing your Portal in the Workshop environment. I'll cover a few of these in this section.

Add Books and Pages to Your Portal

A book forms the basic placeholder for different pages within a portal. In the RealPortal example, we could have a Realtor book, with the different pages that a realtor would be interested in. Portlets are added to individual books and pages. Administrators can let users create their own Portal Desktops with these resources.

By default, when you create a new portal a book and a page are created for you. You can create additional books and pages by dragging and dropping the appropriate controls from the palette on the left side onto the Portal Designer. Select a Book or a Page from the Portal Designer window. In the Document Structure window, you can set different properties on the book or page you selected. You can do things like change the

layouts, presentation styles, titles, skins, look-and-feel, and various other properties. We won't discuss these in detail here, but it is worth your time to explore these for yourself.

Set Up Navigation for the Portal Desktop

Once you've created the appropriate books and pages for your portal, the next step is to set up the appropriate navigation. You also need to set the default page that will appear when the users access the portal. Right-click on a book and select Navigation. There are three levels of navigation that you can set using WebLogic Workshop.

- ***Multi-Level Menu:*** Multiple levels of nested tabs for navigating among books and pages.
- ***Single-Level Menu:*** A single row of tabs for navigating among books and pages.
- ***No Navigation:*** Text navigation for books and pages

Once you have a basic portal configured, it is now time to create your portlets and surface them in the portal that you just created.

Portlets in Workshop

You can have three basic types of portlets in WebLogic Portal.

- ***JSP:*** A JSP file surfaced as a portlet within the portal; a JSP portlet is used for simple programmatic functionality.
- ***Java Page Flow*** A portlet based on a Java Page Flow that allows you to leverage the features of the Java Page Flows to create a Web application that can be surfaced using a portlet. Java Page Flow portlets are used complex interactivity or multipage portlets.
- ***Java Web service:*** This portlet calls out to a Web service.

Creating a JSP/HTML Portlet

Start by going to the File Menu and choosing new File Type. Create a new portlet and select the type of portlet you want to create. Select JSP/HTML Portlet (see Figure 2).

Now you can specify various properties for your portlet. Fill in the entries as you want, and click Finish.

Along with the ability to create JSP/HTML Portlets, the BEA Portal Server also contains several tag libraries that help you add personalization, content, and other portal functionality to your JSPs. The WebLogic Workshop Portal extensions provide the following JSP tags. These tag libraries are:

- User/group management
- Personalization and tracking
- Content management
- Property sets
- Internationalization and localization
- Entitlements
- Portal interface rendering
- Utilities

Web Service Portlets

Portlets can call Web services in several ways.

- ***Form:*** A portlet takes some input from users through an HTML form and calls the designated Web service.
- ***Call generation:*** A stubbed-out portlet that calls into the designated Web service. You need to edit the generated JSP to add your functionality.
- ***Interface creation:*** An annotated portlet that includes directions on how to use the interface you will use to call multiple Web services.
- ***Asynchronous interaction:*** Portlets can participate in asynchronous communication with Web services such as conversations.

Java Page Flow Portlets

If you have created a Java Page Flow, you can easily surface the page flow as a portlet using the Portlet wizard. Click on File -> New -> Portlet. Select a Java Page Flow Portlet from the Portlet wizard and complete the wizard.

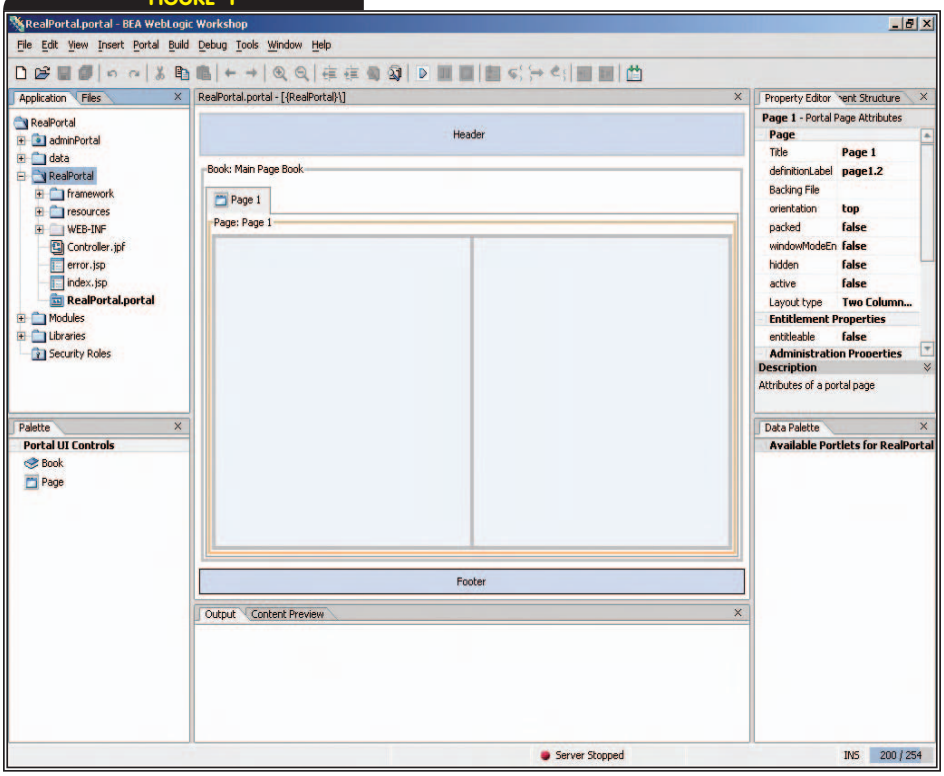
We now know how to create portlets through the BEA WebLogic Workshop tool. Let's look at the controls provided in WebLogic Workshop that help with portal development.

Portal Controls in Workshop

In order to use controls in portlets, you must use the Java Page Flow portlets. The Java controls included with WebLogic Portal Extensions allow you to insert complex tracking and personalization functionality into Java Page Flow portlets. Let's look at these controls.

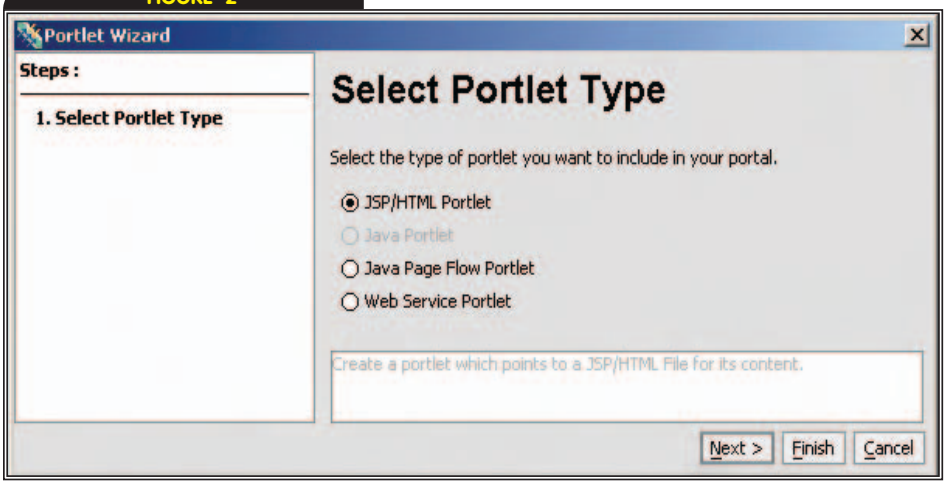
- ***Create user:*** Create new users using the UserManager EJB.
- ***Generic event:*** Generic events are those not used for behavior tracking, and therefore generally not persisted. You can set its attributes and set up a listener for this event.
- ***Generic tracking:*** Exposes the ability to configure, generate, and dispatch a tracking event (events that are generally persisted), to the event service.
- ***User login:*** Enables authentication and allows a visitor to log in to a portal; indicates success and surfaces profile information.
- ***User profile:*** Provides the business logic to retrieve and update user profile information.
- ***User information:*** A utility control;

FIGURE 1



Portal Designer and your portal

FIGURE 2



Create a JSP/HTML portlet

returns the list of roles for a particular user as well as the list of groups of which that user is a member.

Portal Designers in Workshop

BEA WebLogic Workshop comes with several visual designers to develop various portal components. The following designers can be invoked from the Portal Designer:

- ***JSP:*** Designs the JSP and HTML portlets
- ***Property Set:*** Provides the tools to create different types of property sets
- ***Session Request:*** Allows you to create properties that you can set and get from an HTTP Session or Request
- ***User Segment:*** Allows you to create User Segments that are used to perform dynamic personalization based on predefined rules
- ***Portal Placeholder:*** Creates placeholders, which are used to target the results of a content search
- ***Event:*** Lets you register a custom event you have developed
- ***Campaign:*** Allows you to creates campaigns for Portal
- ***Content Selector:*** Creates or edit Content Selectors, which are used to define rules for retrieving content
- ***Catalog Structure:*** Creates fields for labeling the items in your catalog

Deploying Portal Applications

As you develop your portal application, you'll want to deploy it for testing and debugging. Once that is done, you'll want to deploy your portal into production. The deployment concepts for portals are generally similar to those for any J2EE application.

The first step is to deploy the portal application that you create. You can deploy a portal application and its Web applications and Enterprise JavaBeans (EJBs) before you add portals or any other functionality to the application. Then, as you add portals and other functionality, they appear automatically in the deployed application. You can deploy a portal EAR file that you can build through WebLogic Workshop (better for QA or production deployment), or the exploded directory structure (better for development).

The basic steps to deploying your portal application are:

1. Start the WebLogic Server Console in a browser at http://localhost:7001/console.
2. In the WebLogic Server Console, choose Deployments > Applications in the left pane. Right-click Applications and choose Deploy a New Application.
3. In the Deploy an Application window, click the directory containing the portal application you want to deploy.
4. Select the option button next to your application and click Continue.
5. In the next window, review your choices and click Deploy.

Summary

In this article I have explored the basic functionality that BEA WebLogic Workshop Platform Edition provides to help developers develop portal applications for the BEA platform. WebLogic Workshop forms the single entry point for all portal development, replacing older portal IDEs such as the E-business Control Center .

References

- Workshop Help: http://edocs.bea.com/workshop/docs81/doc/en/core

caseSTUDY

Continued from page 23

We just deploy the EJB to the WebLogic Server hosting our WebLogic Integration application, and start the server. Then we can select these EJBs from Workshop and create EJB controls. The EJB control is an interface that wraps the methods of the EJB remote and home interfaces. We just call the methods from within the JPD. Workshop creates the implementation classes that perform low-level tasks such as JNDI lookups.

End-to-End Testing

The BEA WebLogic Workshop IDE allowed us to rapidly develop the application, deploy it on the WebLogic Server, and then test our code. A test browser integrated within the IDE invokes a particular JPD through the Web services stack, allowing us to see and debug our code. We can also copy the URL from the test browser and test our JPD file through a standard browser such as Internet Explorer. Workshop tightly integrates the compilation, deployment, redeployment, and execution in a simple, intuitive manner.

Conclusion

BEA WebLogic Platform 8.1 allowed us to build a mission-critical application with stringent security needs in about three weeks. This platform supports ebXML standards, with important features such as message-level security, transport-security, and guaranteied delivery. Using this framework, we integrated a Microsoft .NET application with J2EE applications.

Acknowledgements

We want to gratefully acknowledge the support of Dr. Bill Freeman, director of research and development for the Integrated Solutions Group of the South Carolina Research Authority. Dr. Freeman is also the project manager for SCRA's work on the DOD EMALL. BEA and ICF provide engineering services to SCRA.

We also want to thank Ricardo Valenzuela, Madhavan Rangarao, Dmitry Dimov, and Komal Mangtani from the BEA Engineering team, who provided technical support to achieve our goals.

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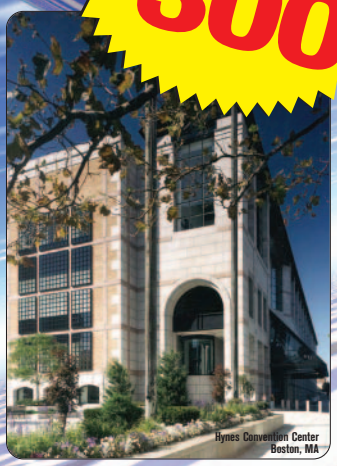

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Edge 2004 East Conference & Expo February 24 – 26, 2004

Keynotes

Chris Hjelm

CHIEF TECHNOLOGY OFFICER, ORBITZ

Tuesday, February 24, 2004 – 10:00 a.m.

Chris Hjelm is chief technology officer for Orbitz and leads the company's technology strategies, engineering, site architecture, and operations. In this role, he is responsible for all aspects of technology, ensuring that Orbitz continues its industry-leading role in providing the lowest cost and most consumer-friendly technology platform in online travel. Before joining Orbitz, Hjelm served as SVP for technology at eBay Inc., overseeing all aspects of its technology. Under his leadership, eBay achieved record levels of site quality and reliability during a period of accelerating global business growth and new product introductions. Chris is also known for his work in creating and advancing world-class technology platforms at high-growth Internet companies as well as in Fortune 500 environments.

David Mendels

GENERAL MANAGER, MACROMEDIA

Wednesday, February 25, 2004 – 10:00 a.m.

SOA+RIA=ROI

Service-oriented architectures are imperative to drive systems and data integration, but for the integration to matter it needs to reach users in meaningful ways. Rich Internet applications (RIAs) combine the richness of the desktop with the reach of the web. Bringing web services and rich Internet applications together fulfills the promise and value proposition of service-oriented architectures, as users benefit from actionable, intuitive, and effective data and information. This next generation enterprise application architecture will deliver solutions that capitalize on existing systems and increase return on investment.

David Mendels is general manager for designer and developer products for Macromedia. Since joining Macromedia in 1992 he's played a major role in the development of Macromedia's product and business strategies and in his current role supervises the gamut of Macromedia's designer and developer products, including Flex, Flash, Dreamweaver, and ColdFusion. In that capacity, he has overall responsibility for the business unit and directly manages product marketing, product management, and product development. Mendels began his career at Macromedia in the international department, moving to Japan to lead the company's field operations, sales, and marketing there. After returning to the United States in 1995, Mendels held positions running business development, alliances and, general management of a number of Macromedia product groups.

Dr. Robert Sutor

DIRECTOR OF WEBSPHERE INFRASTRUCTURE SOFTWARE, IBM

Thursday, February 26, 2004 – 10:00 a.m.

Web Services: Surviving the Mid-Life Crisis

Mid-life can be tough on those who had fast-paced, high-profile youths but suddenly find themselves with dependents and responsibilities put upon them by others. So it is with Web services as it enters the middle phase of its standardization process and moves from being a favorite of the early adopter crowd to being a dependable citizen for the IT mainstream. How is it adapting to the challenge? Have companies like IBM delivered on the early promises of Web services? Do we need to adjust expectations now for Web services so we're not faced with major disappointments later? Dr. Sutor will discuss these and other issues, as well as explain how Web services is a critical part of how companies can become on-demand e-businesses.

Dr. Bob Sutor is IBM's director of WebSphere Infrastructure Software. He is responsible for business and product leadership for the WebSphere Application Server and WebSphere Studio software offerings. Previously, Bob was IBM's director of Web Services Technology, responsible for driving the cross-IBM Web services initiative to continue and advance IBM's leadership in providing Web services solutions, products, and services.

DAY 1 FEBRUARY 24

	Java	.NET	Web Services
8:00	Registration		
9:00	Empowering Java and RSS for Blogging	NET Compact Framework Performance Tips and Tricks	WS-CAF: Standardized Web Services Transactions and Composite Applications
10:00	Opening Keynote – Chris Hjelm, CTO, Orbitz		
11:00	**EXPO OPEN**		
1:00	Keynote Panel Discussion - 21st Century Computing: Is IT Fulfilling its Promise - or Breaking It?		
2:00	Enterprise Architecture & Open Source	Using the Enterprise Instrumentation Framework	Web Services Orchestration, Management, and Security - Will They Play Together?
3:00	Squeezing Java	J2EE/.NET Interoperability	Session TBA
4:00	Opening Night Reception		

DAY 2 FEBRUARY 25

	Java	.NET	Web Services
8:00	Registration		
9:00	Desktop Java	Best Practices and Techniques for Building Secure ASP.NET Applications	Building Interoperable Web Services
10:00	Keynote Presentation - David Mendels, General Manager of Products, Macromedia		
11:00	**EXPO OPEN**		
1:00	Keynote Panel Discussion - The Open Source Debate		
2:30	Next Phase in Evolution of J2EE	Microsoft Office 2003: A Solutions Platform	Service-Oriented Integration: Making the Right Choices To Support The Next-Generation of Integration
4:00	Aspect Oriented Programming & Java	.NET Framework: Exploring What's New in the Base Class Library for "Whidbey"	Impress the Boss: Roll Your Own Web Services Initiative

DAY 3 FEBRUARY 26

	Java	.NET	Web Services
8:00	Registration		
9:00	Simplifying J2EE Applications	Session TBA	Government Real-Time Fraud Detection Using Web Services
10:00	Keynote Presentation - "Web Services: Surviving the Mid-Life Crisis", Dr. Robert Sutor, IBM		
11:00	Apache Axis	Introduction to BizTalk Server 2004 and Web Services	Exploring the Dark Side
12:00	**BREAK**		
1:00	ANT/JUnit	BizTalk Server 2004 Technical Drilldown	ID, Please. The Case for Giving Web Services an Identity
3:00	Session TBA	Moving your Architecture to .NET	Session TBA

XML	MX
XML Security Integration Challenges	Enterprise Infrastructure for Rich Internet Applications with Macromedia Flex
SOA Foundation Components: Building an XML Content Router	Code Base RIA's
Real Best Practices for XML Web Services Management and Security	Using Flash with Web Services

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XML	MX
XForms - Simplifying the Development of Transactional Web Forms	Using Web Services with ColdFusion
Session TBA	ColdFusion Components
Using XML Schemas Effectively in WSDL Design	Rapidly Build Web Services Applications with ColdFusion and Studio

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Strategies for Web Services Security Success

XML	MX
What's New in XSLT 2.0?	Leveraging Web Services
Rich Internet Applications: An XML-Based Approach	Session TBA
Cutting the Crap: Using Rules to Clean Up XML	Code-based Rich Internet Applications with Macromedia Flex
Session TBA	Session TBA

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JAVA SESSIONS

Aspect-Oriented Programming & Java

RON BODKIN, NEW ASPECTS OF SOFTWARE

Aspect-Oriented Programming (AOP) has become a hot topic of discussion for enterprise development, with the recent news of support by IBM, JBoss, BEA, Eclipse, and IntelliJ.

- What's real?
- What is AOP?
- What problems can it solve today?
- How can you make an informed decision about using AOP?
- What is the best adoption strategy?
- What are the long-term possibilities for AOP?

This session answers these questions and gives an introduction to AOP for enterprise Java development. AspectJ is a seamless AOP extension to Java. It allows the consistent and flexible implementation of crosscutting concerns such as security, exception handling, testing, logging, caching, and business rules. This is a major improvement on scattered and tangled traditional implementations.

This tutorial introduces AOP and shows how to use AspectJ effectively in an enterprise context, including examples of tools support. Attendees should have experience with OO design and Java development. AspectJ is an open source project available from the Eclipse consortium.

BIO: Ron Bodkin is the founder of New Aspects of Software, which consults and trains on enterprise Java applications with an emphasis on Aspect-Oriented Programming. Ron is also a member of AspectMentor, a consortium of AOP experts. Ron previously worked for the AspectJ group at Xerox PARC, where he led the first AOP implementation projects and training for customers. Prior to that, Ron was founder and CTO at C-bridge, a consultancy that delivered enterprise applications using Java and XML frameworks.

Squeezing Java

ALAN WILLIAMSON, JAVA DEVELOPER'S JOURNAL

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

BIO: Alan Williamson is SYS-CON Media's technical director, and editor-at-large of *Java Developer's Journal*. In addition, he holds the CTO office at n-ary (consulting) Ltd, one of the first companies in the UK to specialize in Java at the server side.

Enterprise Architecture & Open Source

JAMES MCGOVERN, THE HARTFORD FINANCIAL SERVICES GROUP, INC.

Use of open source software within the enterprise is gaining momentum. The vast majority of organizations use some form of open source software, such as Linux, Apache, and JBoss, in production environments. The enterprise architecture, however, needs to incorporate the best thinking of the industry that not only includes using open source but contributing to it. The model in which open source software gets developed has practices that could assist an organization in becoming agile in their software development practices and allow them to develop software faster, with lower costs and better quality. In this session you will learn:

- Two models of development: the cathedral and the bazaar
- Value proposition of using open source
- Harnessing the power of the mob: the value proposition of contributing to open source
- Making the build versus buy decision: additional thoughts

BIO: James McGovern is an industry thought leader and the author of the best-selling book, *A Practical Guide to Enterprise Architecture* (Prentice Hall). He is working on two upcoming books entitled *Agile Enterprise Architecture* and *Enterprise SOA*. He is employed as an enterprise architect for The Hartford Financial Services Group, Inc. He holds industry certifications from Microsoft, Cisco, and Sun. He is member of the Java Community Process and of the Worldwide Institute of Software Architects.

J2EE v1.4

BILL ROTH, E.PIPHANY

Day-to-day work with deadlines makes it difficult to keep abreast of the rapidly evolving landscape of J2EE, especially given the numerous constituent J2EE technologies. J2EE v1.4 is chockfull of new services that affect and benefit a wide range of enterprise development tasks. This talk will extract core material from the speaker's new *J2EE Developer's Handbook* and describe what's embodied by J2EE v1.4. The new Web services features provided by J2EE v1.4 in particular will be highlighted. The talk will also briefly address those services missing from the current J2EE standards but still needed when building enterprise applications.

BIO: Bill Roth is senior technical evangelist for E.piphany. With over 15 years in this industry, he has played numerous roles in engineering and product marketing including program manager for Java IDL, and managing product marketing and product management for J2EE 1.2 at Sun.

Apache Axis

CHRIS HADDAD, BURTON GROUP

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

BIO: Chris Haddad has 13 years experience in Web services, protocols and standards (SOAP, UDDI, WSDL), application framework, development tools, key development languages (Java, C++, Perl, JavaScript), and enterprise application integration. His background includes Grand Central, Flamenco Networks, Adjoin, Securant, Employease, Jamcracker, TRX, and Raygun.

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Empowering Java and RSS for Blogging

JASON BELL

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

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

Ant/JUnit

KYLE GABHART

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

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

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

BIO: Kyle Gabhart is an independent consultant, mentor, and published author, specializing in J2EE, XML, and Web services technologies. He is a prolific writer, with his most recent work displayed on IBM's developerWorks Web site in the J2EE Pathfinder column. You can find him on the Web at www.Gabhart.com.

Desktop Java

JOE WINCHESTER, IBM

Java is enjoying a renaissance on the desktop, and there are several reasons for this:

- The issues that plagued early client/server projects or Java desktop applications have largely been solved. Swing 1.4.2 delivered great performance improvements, good fidelity XP, and GTK look-and-feel classes. Java Web Start now exists as a way to deploy to a client PC the programs that run in a local JRE and enjoy the benefits of local caching, lazy update, and execution within Java's security model
- Java is becoming part of the default installation setup for many PC vendors such as Dell, HP, and Gateway.
- SWT provides a set of rich native controls over and above those offered by AWT, and many Java developers are finding that it's a useful GUI toolkit to use in their end-user applications.
- HTML is no longer being viewed as the only viable client for application development. A number of hybrid technologies that combine the benefits of server-side computing with a client GUI have arisen, including Ultra Lightweight Client, Droplets, JFlash, Macromedia Royale, Asperon, and Thinlets.

This session will look at the Java desktop space and discuss the issues and technologies, as well as what is at stake if Java can or can't recapture its lost pride as a client platform.

BIO: Joe Winchester is a software developer working on WebSphere development tools for IBM in Hursley, UK. Joe was part of the expert group for JSR 57.

.NET SESSIONS

.NET Compact Framework Performance Tips and Tricks

JIM WILSON, JW HEDGEHOG, INC.

Learn the techniques that can be used to increase the responsiveness of user interface and network operations for users of applications built on the .NET Compact Framework. Look under the covers at advances and changes in the "Whidbey" release that significantly improve performance. Get a general overview of how the .NET Compact Framework works under the hood at runtime, with specific focus on performance implications. Next, we cover general user interface tips to increase performance. Explore how asynchronous infrastructure, such as threading, in the .NET Compact Framework can be leveraged to optimize both user interface and network operations. Learn about the architectural guidelines for creating applications that perform well under frequently changing network conditions.

BIO: Jim Wilson is president and cofounder of JW Hedgehog, Inc., a consulting firm specializing in the integration of smart devices as part of enterprise solutions with a focus on the .NET Compact Framework, .NET Framework, Web services, and other XML-related technologies. He develops and teaches DevelopMentor's Mobility training course, was one of Microsoft's original five MVPs for the .NET Compact Framework, has written articles for numerous publications, and has spoken at a myriad of events, including Microsoft's Tech-Ed and Mobility Developers conferences.

Best Practices and Techniques for Building Secure ASP.NET Applications

PATRICK HYNDS, CRITICALSITES

When the enterprise depends on your application, careful attention to security is essential. This session provides specific recommendations to follow when developing secure ASP.NET Web applications and services, and focuses on the details of configuring IIS for security. Understand how to use authentication, authorization, threat modeling, configuration settings, and secure database access to create secure systems, plus learn common coding techniques for storing secrets, error handling, data validation, and code access security.

BIO: Patrick Hynds, MCSD, MCSE+I, MCDBA, MCSA, MCP+Site Builder, MCT, is the Microsoft Regional Director for Boston and the CTO for CriticalSites. Named by Microsoft as the Regional Director for Boston, he has been recognized as a leader in the technology field. An expert on Microsoft technology (with at last count 54 Microsoft certifications) and experienced with other technologies as well (WebSphere, Sybase, Perl, Java, Unix, Netware, C++, etc.), Patrick previously taught freelance software development and network architecture. He has been a successful contractor who enjoyed mastering difficult troubleshooting assignments. A graduate of West Point and a Gulf War veteran, Patrick brings an uncommon level of dedication to his leadership role at CriticalSites. He has experience in addressing business challenges with blended IT solutions involving leading-edge database, Web, and hardware systems. In spite of the demands of his management role at CriticalSites, Patrick stays technical and in the trenches, acting as project manager and/or developer/engineer on selected projects throughout the year.

Using the Enterprise Instrumentation Framework

DEREK FERGUSON, EXPAND BEYOND CORPORATION

The Microsoft .NET Framework 1.1 and Windows Server 2003 offer a number of new features to help developers instrument their code. In this session, you'll learn about the challenges facing application management in today's distributed world. We will examine the new unified instrumentation API in the Enterprise Instrumentation Framework (EIF), including the new Windows Event Trace available in Windows Server 2003, configurable at-source event filtering, and how request-based event tracing using EIF allows you to put a request context around the trace messages that map to a business process flow in your application. We will also discuss the benefits to both the developer and the application administrator for using EIF in your application.

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

.NET Framework: Exploring What's New in the Base Class Library for "Whidbey"

JULIA LERMAN

The base classes serve as the essential libraries for any developer. Continued evolution of the base classes provides numerous benefits, including the ability to write more reliable, faster solutions, easier-to-write code, and more solutions entirely in managed code. Take a look at the many features that are a part of that evolution, including features in IO, event-logging, and various features in System.

BIO: Julia Lerman is the owner of Julia Lerman, Inc (dba The Data Farm). and has been developing software applications and consulting to businesses since 1984. Julia is the founder and leader of VTdotNet, Vermont's .NET user group (www.vtdotnet.org), as well as a member of the User Group Relations Committee for INETA (International .NET Association) www.ineta.org. She writes on Visual Studios and .NET and in her pre-Visual Basic days, FoxPro Advisor. Having spent many years as a FoxPro. Julia is working very hard to help bring the same community spirit to .NET that is so unique to FoxPro.

Microsoft Office 2003: A Solutions Platform

JOHN HOLLINGER, INTERNOSIS

For all developers who would like to integrate custom business solutions with Microsoft Office products, this session will introduce you to the expanded developer features that have been included in the newest version of Microsoft Office. Come explore new XML-based programmability in everything from Word 2003 and Excel 2003 to FrontPage 2003 and SharePoint. Build powerful, modular solutions with Web services. Learn about InfoPath 2003 support for XML standards. Discover how to use the Microsoft Visual Studio Tools for the Microsoft Office System to automate and extend Microsoft Office Word 2003 and Microsoft Office Excel 2003 using Visual Basic .NET and Visual C# .NET. More than ever, Office has a solution for you.

BIO: John V. Hollinger serves as CTO of Internosis clients are able to leverage the latest technologies while planning for tomorrow's challenges. Mr. Hollinger is responsible for the performance of the Northeast/Commercial business unit, including all aspects of business development, client care, marketing, resource management, and financial management. Prior to joining Internosis, he played an instrumental role in the creation of New Technology Partners (NTP) and then went on to run a highly successful division of Xpedior, where his team was a four-time Microsoft Solution Provider Partner of the Year in New England and the recipient of the award on a worldwide basis in 1997. Previously, John was vice president of Advanced Technologies at AIG.

Advanced BizTalk Server 2004

BRUCE BACKA, CRITICALSITES

BizTalk Server 2004 is designed to provide Enterprise Application Integration (EAI), Business Process Automation (BPA), and Information Worker Integration solutions. Come join us for a technical drilldown on the new features and toolsets available.

BIO: Bruce Backa is the founder of CriticalSites. A noted business leader and consultant in the IT industry, he has acted as chief architect, technologist, and project manager for assignments involving large-scale technology and implementation strategies. He has held the positions of director of Technology and Business Research for the American Stock Exchange (AMEX) and director of Technology for American International Group. Bruce has been responsible for the architecture, implementation, and management of a worldwide client/server networking infrastructure for a Fortune 10 company with a platform of over 600 servers connecting 10,000 users across 50 cities throughout North America and offshore. In 1994 he founded NTP Software, a provider of business solutions for Windows NT and Windows 2000. At the recent World Economic Forum in Switzerland, Bruce was recognized as a technology pioneer. This follows a similar award from the National Computer Conference in 1974, where he was honored as a part of the Dartmouth College team that invented computer timesharing.

Moving your Architecture to .NET

CARL FRANKLIN, FRANKLINS.NET

This session is focus on how to migrate existing business components from VB6 COM Objects to VB.NET assembly components. We'll spend time discovering how to best move different tiers of a multi-tiered application from COM to .NET, as well as effective strategies on how to wrap existing COM components for interoperability. We'll also examine best practices for moving your application from a COM-based architecture to a .NET-based architecture.

BIO: Carl Franklin has been a luminary in the VB community since the very early days. Since then he has written extensively on the subject of VB. He has authored two books for John Wiley & Sons on sockets programming in VB, and in 1994 he helped create the very first Web site for VB developers, Carl & Gary's VB Home Page. He now teaches hands-on VB.NET classes for his company, Franklins.NET. He has taught developers from Citigroup, Aetna, Fidelity Investments, Fleet Bank, Foxwoods Casino, UTC, Hubbell, Microsoft, Mohegan Sun Casino, and Northeast Utilities, to name a few. Carl is cohost of a weekly talk show on his Web site for .NET programmers, called ".NET Rocks!" Carl is MSDN Regional Director for Connecticut.

Introduction to BizTalk Server 2004

BRIAN LOESGEN, NEUDESIC

BizTalk Server 2004, the latest and third version of BizTalk, is an exciting tool that all .NET application developers should know about. BizTalk fills two key business needs: enterprise application integration and business process automation. The powerful messaging platform allows for easy integration between applications, and also between enterprises. The business process automation engine, based on the new BPEL XML specification, allows for automation of even the most complex business processes. Throw in InfoPath for a user interface into BizTalk, tight integration with Visual Studio, Sharepoint, and Office-based monitoring and reporting tools, and you get an incredibly powerful tool.

This session will be an overview of BizTalk Server 2004. Concepts and tools will be demonstrated by walking through several real-world, practical examples of BizTalk usage. Particular attention will be paid to Web service integration and orchestration, showing why BizTalk Server 2004 deserves consideration as the integration "glue" in a services-oriented architecture.

BIO: Based in San Diego, Brian Loesgen is a principal consultant with Neudesic, a premier southern California solution provider and system integrator. At Neudesic, Brian uses his expertise to architect and deliver advanced Microsoft technology solutions, and to translate new, leading-edge technologies into real-world value. He is a coauthor of the *Professional XML*, *Professional ASP/XML*, *Professional Windows DNA*, *Professional ASP.NET Web Services*, and *Professional VB.NET Web Services* books from Wrox, and is currently working on the *BizTalk Server 2004 Developers Guide*, due in 2004. In addition, Brian has written technical white papers for Intel, Microsoft, and others. Brian has spoken at numerous major technical conferences worldwide and is a cofounder and president of the International .NET Association (ineta.org). He coleads the San Diego .NET user group, and leads the San Diego Software Industry Council Web Services SIG.

In his spare moments, Brian enjoys outdoor activities such as cycling, hiking in the mountains, kayaking, camping in the desert, or going to the beach with his wife Miriam and children Steven and Melissa.
Brian can be reached at brian.loesgen@ineta.org.

WEB SERVICES SESSIONS

WS-CAF: Standardized Web Services Transactions and Composite Applications

ERIC NEWCOMER, IONA TECHNOLOGIES

The Web Services Composite Application Framework is a collection of three specifications – Web Service Context (WS-CTX), Web Service Coordination Framework (WS-CF), and Web Service Transaction Management (WS-TXM) – designed to solve problems that arise when multiple Web services are used in combination ("composite applications") to support information sharing and transaction processing. As coauthor of the specification, Eric will discuss how WS-CAF addresses the underlying issues of Web service context propagation and transaction management to expand the scope, usability, and reliability of Web services for business process automation.

BIO: In the role of chief technology officer at IONA, Eric is responsible for IONA's technology roadmap and the direction of IONA's e-Business Platforms as relates to standards adoption, architecture, and product design.

Government Real-Time Fraud Detection Using Web Services

NEIL MCGOVERN, SYBASE, INC.

Government agencies are faced with increasing amounts of data and are challenged to make sense of, and act on, that data in real time. Failure to interpret and execute on data can result in security threats and, potentially, loss of life. Government agencies are increasingly investing in Web services solutions to address their need for real-time access to information.

The Canadian Passport Office is an example of a government agency leveraging Web services to exchange information in real time to combat terrorism and other illicit uses of fraudulently obtained passports. The agency selected IT consulting firm Pentelar and Sybase, Inc., technologies to electronically authenticate identity document data through the use of Web services and ebXML. Identification tasks performed across 10 provinces and 3 territories previously handled by physical document inspection are now conducted in real time with absolute security and reliability.

In this session, Sybase and Pentelar will discuss this successful pilot project and highlight the ebXML capabilities that enable the Canadian Passport Office to address real-time information exchange.

BIO: Neil McGovern has over 15 years of experience in the software industry. Currently, he is responsible for platform strategy for Sybase's infrastructure product line, including its enterprise-class RDBMS; Sybase ASE; and integration, portal, and tools product lines. Prior to that, Neil was responsible for building the Sybase (New Era of Networks) Adapter suites, commonly recognized as one of the most advanced and complete sets of adapters in the EAI marketplace. Neil developed ERP package expertise as CTO of Convoy Corporation, which specialized in PeopleSoft integration. He led the Development and Professional Services teams for Convoy Corporation, which was purchased by Sybase (New Era of Networks) in 1999 after recording triple-digit growth for three consecutive years.

Service-Oriented Integration: Making the Right Choices To Support The Next-Generation of Integration

DAVID CHAPPELL, SONIC SOFTWARE

Applications are increasingly being developed "built-to-integrate," providing the ability to easily expose key functionality through commonly defined interfaces. Gartner calls this concept SODA, or service-oriented development of applications, fitting into its overall service-oriented architecture landscape. When applied to the ever-present integration challenge, SODA represents a transition to service-oriented integration.

But making the right architectural decisions is absolutely vital to ensuring success with service-oriented integration projects – whether applications were built to integrate or not. Choices at all levels – from application-interface style to overall system architecture – can seriously affect the long-term value derived from integration projects. Application infrastructure products on the market today embody architectural directions that should be carefully examined before making purchase decisions. Any two products that claim to support a "service-oriented architecture" may, in fact, promote radically different architectures.

This presentation will examine the leading choices for supporting service-oriented integration: enterprise service buses (ESBs), integration brokers, and application suite platforms.

BIO: Dave Chappell, VP and chief technology evangelist for Sonic Software, has over 18 years of experience in the software industry. Dave and Sonic Software are involved in many standards organizations, technical committees, and expert groups, including the W3C, OASIS, WS-I, and the Java Community Process. Dave is an active contributor to the Apache Axis project and SOAPBuilders.

Dave also has extensive experience in distributed computing, including message-oriented middleware, CORBA, COM, and Web application server infrastructure. In 2002, Dave received the "Most Outstanding Individual Contributor to the Java Community" award from the editors of JavaPro Magazine.

Securing the Web: What Can Be Done Today

MARK SECRIST, HEWLETT-PACKARD CO.

Security is considered one of the main barriers to the adoption of Web services today. With the proliferation of emerging security standards, there is a lot of confusion over which ones are mature enough to use and how they might fit together. This session will present cover current and emerging security standards for Web services and show how they can be fit together architecturally to address various security concerns. At the conclusion, the audience will have a better understanding of these standards and how to begin securing their own Web services.

BIO: Mark Secrist is a senior software consultant for HP's Developer Resources Organization, with over 15 years of experience working in the software development industry. He provides technical consulting to HP and its customers in the areas of J2EE and Web services development, as well as development strategies for "management-ready" applications. In this capacity, he has written a number of white papers and trade publication articles, presented at a number of industry events, and provided training and consulting to many of our enterprise customers.

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Exploring the Dark Side

PETER VARHOL, COMPUWARE CORPORATION

The growing use of services-oriented architectures puts pressure on application developers relying on Web services for key features of their applications. Performance, scalability, and reliability of these components affect the ability of applications to meet service-level agreements, yet can't easily be analyzed as a part of the application when developers have a problem. In fact, the Web service may be on a different software platform than the rest of the application. This session describes how developers can shed light on memory use in Web services written in either .NET or Java, even if they didn't write the code and wrote their own applications on the other platform.

BIO: Peter Varhol is a product manager at Compuware Corporation, where he provides direction for developer tools targeting enterprise applications and Web services. He holds graduate degrees in computer science and mathematics.

Building Interoperable Web Services Using WS-I Basic Profile

KEVIN LIU, SAP LABS, LLC

The promise of Web services interoperability is based on a set of standards, including XSD, SOAP, WSDL, and UDDI. However, early interoperability experiments such as the SOAPBuilder activity has proven that making these technologies seamlessly work together, inter- or intra-enterprise, is a bigger challenge than most of us expected. Most of the Web services technologies are still in the standardization process, and Web services platforms have to be based on pre-standard draft specifications. The inconsistencies and ambiguities left in these initial drafts can easily lead to different interpretations for the same features and substantially compromise the promised interoperability. This presentation explains how WS-I Basic Profile addresses these challenges, and what are the key advises you can get from the profile that can make your Web services interoperable. It explains why the profile disallows SOAP encoding and why RPC style should give way to document style.

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

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

ASHISH LARIVEE, NOVELL

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

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

Web Services Orchestration, Management, and Security - Will They Play Together?

PAUL LIPTON, COMPUTER ASSOCIATES

Web Services orchestration, management, and security are among the principal challenges facing implementers of service-oriented architectures today. There is still much confusion in the IT community about the standards themselves, which are at various stages of maturity. Also, their relevance to enterprise IT and how they might someday be able to effectively work together is often unclear. This session provides a useful overview of standards in these three critical areas of Web services – orchestration/choreography, management, and security – and more importantly, how each affects the other. Attendees will gain practical knowledge and a deeper understanding of future trends and the need to address certain real-world issues in order to create a more cost-effective and agile IT infrastructure.

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

Impress the Boss: Roll Your Own Web Services Initiative

BOB ZUREK, ASCENTIAL SOFTWARE

Some companies are leveraging open source software like Linux, JBoss, PHP, MySQL, and Apache SOAP to develop and deploy Web services. As this open source Web services stack continues to mature, companies will benefit beyond simply saving money on license fees; they will be able to assemble the stack and get a Web service up and running quickly as well.

Developers frustrated by their enterprise's lack of Web services interest can immediately master and build Web services at home with open source stack components with little investment except time and a broadband connection. Imagine impressing your company with a demo of wrapping that chunk of code as an open source Web service and calling it from a legacy Visual Basic application.

BIO: Bob Zurek, VP of Advanced Technology, Ascential Software, is responsible for Ascential's overall product strategy. He is instrumental in developing and driving its enterprise integration strategy, including its parallel processing framework, data quality, and Web services strategies. Previously, he was a senior analyst with Forrester Research; prior to Forrester, he held senior management positions at LumaPath, Centive Systems, and Sybase.

XML SESSIONS

Real Best Practices for XML Web Services Management and Security

KERRY CHAMPION, WESTBRIDGE TECHNOLOGY

Companies deploying Web services in a meaningful way are increasingly finding they need to address Web services management and security early in the architectural phase. Basic Web services connections are easy to do, but managing the security, performance, scalability, and the inevitable changes to the production environment requires some knowledge, expertise, and planning. This session cuts through the hype and outlines real-world mistakes many companies make when deploying Web services and the real best practices from companies who have successfully captured the value of XML Web services. It provides practical advice on how to successfully manage and secure your XML Web service environment.

BIO: Kerry Champion is president and founder of Westbridge Technology, a leading provider of XML Web services management and security solutions. A frequent writer and speaker on XML Web services, Kerry is a renowned technologist who has served in various senior technical and product strategy roles at enterprise security and messaging companies.

SOA Foundation Components: Building an XML Content Router

DAN STIEGLITZ, TIAA-CREF

One of the fundamental components for any burgeoning SOA will be an XML content router. This session explores the concepts, patterns, and open source software available that facilitate building an XML content routing system. The system can be exposed as a Web service or simply as a stand-alone J2EE component for use in your enterprise. The "restaurant" pattern is introduced as the principal design pattern for building the service, and this pattern's applicability to building generic services is discussed. Applying the router as an XML data integration tool is also discussed, as well as its potential for acting as a service orchestrator.

BIO: Visit www.sys-con.com/edge for complete speaker information.

What's New in XSLT 2.0?

STEVE HECKLER, ACCELEBRATE

XSLT 2.0, which may achieve W3C Recommendation status by conference time, offers unparalleled power in conjunction with XPath 2.0 for transforming XML documents. In this engaging, example-rich seminar, Steve Heckler demonstrates the most important new features of XSLT 2.0, including sequences, new data types and XML Schema support, regular expressions, multiple document output, grouping, new control-flow operators, and much more. Current/future support for XSLT 2.0 on the Java and .NET platforms will also be discussed. Most examples will use Saxon, but .NET examples will be included if .NET supports XSLT 2.0 by conference time.

BIO: Steve Heckler has been a leading IT trainer and application developer for nearly a decade. Prior to founding Accelebrate in March 2002, he served nearly seven years as vice president and then president of WestLake Internet Training. He holds bachelor's and master's degrees from Stanford University.

Using XML Schemas Effectively in WSDL Design

CHRISTOPHER PELTZ, HP

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

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

Using Rules to Clean Up XML

GARY BRUNELL, PARASOFT

Garbage in, garbage out – it's an axiom that applies to many aspects of enterprise development, but none more so than building reliable and robust Web applications and integration projects with XML. Since its inception, XML has been seen as the cure-all for problems related to Web applications and integration projects. However, poorly written XML can slow down an integration project, or worse, cause the integration project to collapse. The key to successfully using XML in an integration project is to first understand the inefficiencies that may cause poorly written XML, and then apply a rule-based system that establishes policies to follow.

BIO: Gary Brunell joined Parasoft in the fall of 2001 to develop and head the company's professional services division. He is responsible for spearheading delivery services, technical support, and training initiatives as well as establishing process-improvement infrastructure.

XML: Getting Started with Minimum Investment

KETAN PATEL, DATAWATCH

Many organizations are evaluating XML as an enabler for sharing and presenting information. Whether part of a portal strategy, an alternative to EDI for billing, or a data conduit to an information repository, XML is core to many future projects. As IT managers evaluate XML's potential, they should understand its capabilities and limitations. XML is not the panacea for all technology issues. However, as an enabler, XML can provide a common language for sharing information inside and outside your organization. The key is to use the technology in projects that have a clear return and minimize the investments required.

BIO: Datawatch director, Technical Strategy, Ketan Patel has over 15 years of experience developing and marketing technology products to customers who are cautious about technology adoption. During his career, Ketan has focused on bridging the gap between technology and business, and is passionate about bringing information technology solutions to market.

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The program, including topics and times, is subject to change. Please refer to www.sys-con.com for all updates.

XForms - Simplifying the Development of Transactional Web Forms

ASHISH LARIVEE, NOVELL

XForms is a W3C specification that specifies a declarative language for solving a common requirement for advanced user interaction, data validation, and XML processing. XForms is designed to be integrated into XHTML, but is not restricted to being a part of that language alone. It can be integrated into any suitable markup language. This session gives an introduction to XForms and explains how XForms in the client tier of the J2EE application architecture. In addition, it will cover the benefits of XForms and why it is a perfect fit for interacting with J2EE and Web services. A demonstration of XForms in a J2EE environment using an XForms- compliant browser and a sample application further illustrates the advantages.

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

Rich Internet Applications: An XML-Based Approach

CHRISTOPHE COENRAETS, LASZLO SYSTEMS

Rich Internet applications deliver groundbreaking, highly interactive user interfaces that provide a user experience similar and often superior to desktop applications. In this session, we will discuss the benefits of rich Internet applications, review the market landscape, and explore an XML-centric approach for developing rich Internet applications that can be delivered to any browser today. As a practical example, we will demonstrate how to build a rich Internet application version of an Amazon store using an XML-based presentation server to deliver the rich user interface, and the Amazon Web services API to deliver the content.

BIO: Christophe Coenraets worked at Sybase/Powersoft from 1994 to 2000. He started working with Java in 1996 and became the technical evangelist for the company's Java and Internet Application Division. Christophe then joined Macromedia as the company's JRun and J2EE technical evangelist. He joined Laszlo Systems early in 2003.

XML Security Integration Challenges

PHIL STEITZ, AMERICAN EXPRESS

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

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

Attend a FREE One Day Security Tutorial

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Strategies for Web Services Security Success

Wednesday, February 25, 2004

Are you a developer, software architect, IT operator, or security administrator deploying or planning to deploy XML Web services? If so, this technical seminar is designed to arm you with the practical information and best practices you need to securely deploy XML Web services in your environment. Many questions will be addressed, such as: Why do Web services need special security? What standards are being created and what do they address? How do I leverage my existing environment to secure Web services? What are the different architectural and technical approaches to solving the problem? How can I centrally manage security in a decentralized environment?

Course Highlights/Benefits

- Overview of XML Web services security: Why is it important?
- Discussion of various standards (WS-security, SAML, XML-Enc, XML-Sig, XKMS)
- Architectural considerations
- Malicious Web services attacks
- Strategies for securing XML Web services today and in the future
- "Nuts and bolts" demonstrations of security solutions

As part of the tutorial, we will show you how to secure your entire XML environment without adding any additional code.

Course leaders

Dan Neiman is a Senior Systems Engineer at Westbridge Technology and is responsible for training and working with real world customers in solving their security and management needs for XML and Web Services. Previously, Dan worked for Tumbleweed Communications where he directed the field engineers in designing and implementing secure email transports. He has also held positions at CSC and the Department of Defense. Dan holds a BS degree in Management and Decision Systems from Carnegie Mellon University.

Peter Bostrom is a Federal Technology Director at Westbridge Technology and works closely with federal customers. Previously, Peter was VP of Product Management at Sequation, a security solutions provider and CTO and co-founder of ExactOne, an Internet-scale distributed search engine. Peter also worked in a variety of sales, consulting and product management roles at Legent Corporation. He was awarded Systems Engineer of the Year award in his first year there. Peter can be heard on National Public Radioís WAMU in Washington, DC as a regular guest on iPublic Interestî hosted by Kojo Nnamdi and is president of the DC Association of Internet Professionals. Peter holds a BA in International Affairs from The American University after spending three years as an Army Ranger.

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MX SESSIONS

Enterprise Infrastructure for Rich Internet Applications with Macromedia Flex

KEVIN HOYT, MACROMEDIA

Learn how Macromedia's technology initiative, Flex fits seamlessly into today's new service-oriented architectures (SOA). We'll cover design patterns for rich clients, accessing web services and securing your Flex application.

BIO: As a senior sales engineer for Macromedia, Kevin Hoyt plays a primary role in evangelizing the product line, educating the customer base, and supporting the sales organization. Kevin is also a regular speaker at various user group forums throughout the United States.

Leveraging Web Services

TOM JORDHAL, MACROMEDIA

Web Services technology is changing the way we think about designing and building applications. Come and learn what all the fuss is about, find out exactly which problems web services solve, see web services created and used, and even discover how web services expose the world of .NET.

BIO: Tom has been a Principal Engineer at Allaire/Macromedia for over 6 years and has spent the last 2 years on the front lines of Web Services. He is one of the implementers of Apache Axis and is the Macromedia representative on the W3C Web Service Description WSDL 1.2 working group. Before getting involved in Web Services, he was the technical lead for the ColdFusion on UNIX products. Tom is currently 'back home' working on ColdFusion.

ColdFusion Components

GLENDA VIGOREAUX, BUSINESS SYSTEMS CONSULTANTS, INC.

ColdFusion Components combine the power of objects with the simplicity of CFML. This is the way object-based development was intended to be, and in this session, you'll learn about this combination first hand. Starting with a simple data-driven application, you'll gradually convert it into a highly scalable and manageable multitier application, and in the process, will amaze yourself at just how easy ColdFusion makes this process.

BIO: Glenda Vigoreaux has been a Certified Macromedia Instructor and Developer for the last 5 years. She is currently heading the web development division for Business Systems Consultants, Inc. the most successful reseller and services provider of software for associations in the greater Chicago area.

Rapidly Build Web Services Applications with ColdFusion and Studio

SIMON HORWITH, ETRILOGY

The last year has shown that web services are not just another passing fad and their promise of platform-independent distributed applications has been realized. Compared to other application server platforms, ColdFusion makes creating web services easy. This session covers how to create a ColdFusion Component (CFC) in Dreamweaver, as well as how to expose that CFC as a web service by just toggling one attribute of the CFC. That's right: in ColdFusion, it is just that easy.

BIO: Simon Horwith is Chief Technology Officer of eTRILOGY Ltd., a software development company based in London, England. Simon has been using ColdFusion since version 1.5 and is a member of Team Macromedia. He is a Macromedia Certified Advanced ColdFusion and Flash D eveloper and is a Macromedia Certified I nstructor. In addition to administering the CFDJ-List mail list and presenting at CFUGs and conferences around the world, Simon has also been a contributing author of several books and technical papers.

Code-based Rich Internet Applications with Macromedia Flex

CHRISTOPHE COENRAETS, MACROMEDIA

Learn how to use Macromedia's technology initiative Flex to create rich internet applications. This session will cover using components, layouts, and managers to build user interfaces as well as using Flexs XML-based language to create and manipulate client-side data models.

BIO: Please visit www.sys-con.com/edge for a complete speaker bio.

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❑ Don't know

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❑ $10 million – $99.9 million
❑ $1 million – $9.9 million
❑ Less than $1 million
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❑ Web Testing Tools
❑ Modeling Tools
❑ Team Development Tools
❑ Installation Tools
❑ Frameworks
❑ Database Access Tools/JDBC Devices
❑ Application Integration Tools
❑ Enterprise Development Tool Suites
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Novell helps customers dynamically access, provision, manage and deliver secure information services. Customers can flexibly integrate applications and data and ensure unified identity across systems. Novell's Web Services platform, exteNd, is a comprehensive, integrated approach to the visual development and deployment of services-oriented applications.

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LOOK WHAT'S COMING NEXT MONTH

WebLogic Clustering in a Linux Environment

An overview of Weblogic clustering capabilities is presented along with the steps involved in setting up a clustered implementation of the workload. A brief introduction to Blade architecture will be provided, followed by the characterization of the performance and scaling of the workload as the cluster size is increased.

J2EE on Linux

The current trend of businesses to deploy cheaper and easily manageable hardware continues, with more and more business critical applications being deployed on Linux. As a number of organizations use J2EE application servers for their business this article provides an overview on deployment considerations when using a Linux/J2EE combination.

Creating Web Services in WebLogic Workshop using existing WSDL

BEA WebLogic Workshop can be used to consume Web Services that are running on other machines. All you need to know is the location of the WSDL file. From that, WebLogic Workshop can generate everything you need to consume that Web Service, in a matter of minutes.

From the Architect's Annex: Modernizing Legacy Systems

The first of three parts in this column, the author looks at how to incrementally port/integrate a large legacy application written in Cobol and hosted on the AS400 to the WebLogic Platform, thus "modernizing" it.

WebLogic Support: Irrecoverable Stack Overflow Exceptions

A "StackOverFlow" message is usually indicative of an error in the application code of the user, an error in the Java Virtual Machine, or in WebLogic Server itself. This message is usually seen right before a Java Virtual Machine core dump or the WebLogic Server process just "goes away". This is unfortunate, as it may require programmers to think about the implementation details of the Java Virtual Machine on which they are running.

BEA WebLogic DEVELOPER'S JOURNAL

BEA Liquid Data for WebLogic 8.1

DATA INTEGRATION FOR J2EE SOLUTIONS

Reviewed by
RAJAN CHANDRAS

From a broad perspective, the purpose of any business software application falls into one of two categories: operational or strategic. Operational applications provide users with the capability to carry out business processes (such as processing a customer order from order receipt to product dispatch), and present users with the ability to manage the business data accompanying these business processes (such as customer information, order details and delivery status). Strategic applications (such as data warehousing and business intelligence) provide users with the ability to understand and analyze data in order to learn from it. In order to succeed in these purposes, it is essential that the application have access to all the data it requires. Historically, this data was typically owned by the application, and located within the "application silo." Over the years, however, there has been a growing need to reach out and acquire data that lies outside the control of the application, and today, with mounting volumes of diverse and disparate data, data integration is a keenly felt need and a widely accepted mantra. Liquid Data 8.1 for WebLogic from BEA Systems is a data integration solution that is particularly relevant to the Web service–centric world of today, and a solid contender in the J2EE data integration space.

Liquid Data enables users to create a virtual data source that consists of data attributes pulled in from numerous data sources using XML, and then publish methods to manage this virtual data by means of a Web service, served also in the form of XML.

Liquid Data Architecture

Liquid Data sits atop of and is tightly coupled with the BEA WebLogic Application Server. Figure 2 shows the Liquid Data architecture. The main components are:

- ***Data View Builder:*** A GUI-based tool for designing, generating, testing, and deploying Liquid Data queries. The Data View Builder provides drag-and-drop functionality to select and bring together data elements from a variety of data sources, including relational databases, XML files, CSV files, Web services, and other applications (through WebLogic adapters). Data sources first need to be registered using the WebLogic Liquid Data Administration Console, which includes the functionality (i.e., additional tabs) for Liquid Data. The selected data elements combine to form a schema that provides a virtual integrated data source. Data View Builder generates stored queries in XQuery to manage this virtual data, as well as data views – i.e., queries that can be used by other queries and provide an additional level of abstraction – which can be then stored in the Liquid Data repository. Client applications can now use the stored queries as well as execute ad hoc queries, without regard to the underlying (and potentially distributed and heterogeneous) data sources. All in all, the Data View Builder provides the essence of data integration (see Figure 2).
- ***Liquid Data Repository:*** Stores the data views, queries, source and target schemas, Web service descriptions, and other such artifacts.
- ***Liquid Data Server:*** A J2EE application running within WebLogic. The server receives queries (in XQuery) from client applications and executes these queries against the base data sources, using the metadata stored in the Liquid Data Repository and an optimized query plan generated by a distributed query processor within the Liquid Data server.
- ***Liquid Data Query API and Liquid Data Control for WebLogic Workshop:*** An application programming interface for client Java applications needing to access data published by Liquid Data. Enterprise JavaBean (EJB) and JavaServer Pages (JSP) clients can invoke queries using the Liquid Data query EJBs and the Liquid Data JSP tag library, respectively. In addition, applications developed in WebLogic

"Liquid Data is a must-see, if not a must-have"

BEA Systems, Inc.
2315 North First Street
San Jose, CA 95131
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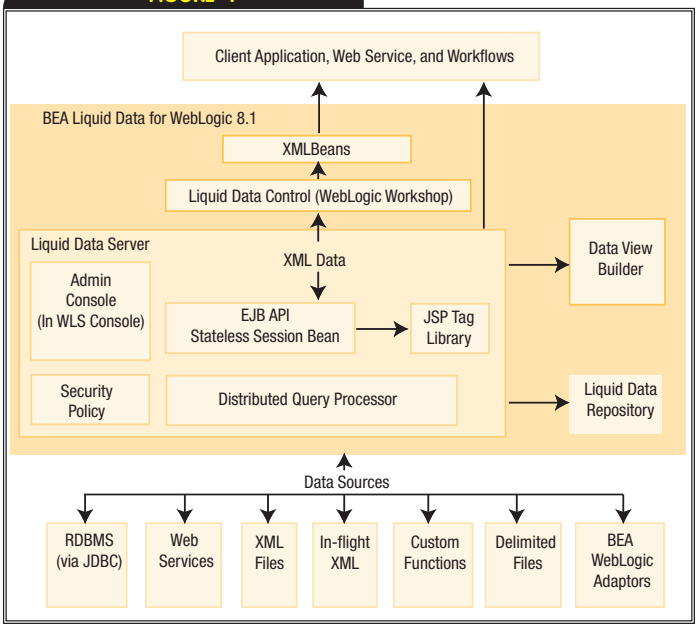
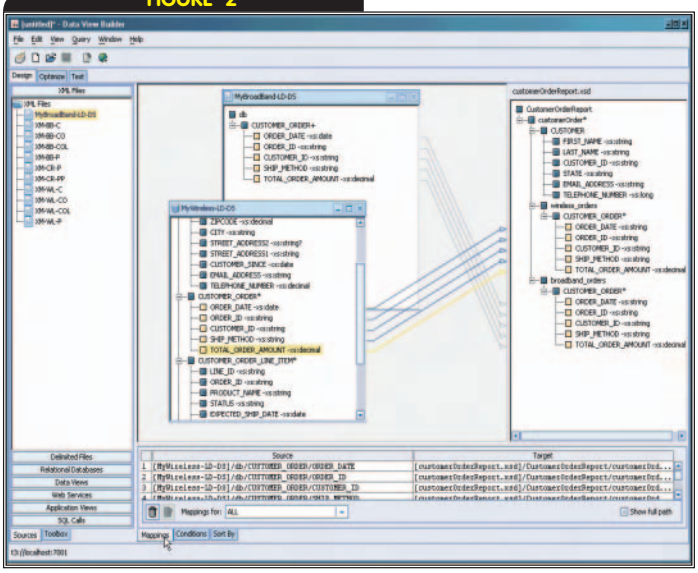
BEA WebLogic Platform 8.1

FIGURE 1



BEA Liquid Data for WebLogic architecture

FIGURE 2



Data View Builder

Workshop can directly use the Liquid Data control extension to the Workshop IDE.

The User Perspective

All this sounds good, but what does it present from a user perspective? The answer to this question depends on the user. Data architects now have a tool that provides a ready means to integrate disparate data using a drag-and-drop paradigm and without needing to acquire advanced skills in J2EE and XML technologies (although my advice to data architects is to get started on acquiring some measure of these skills anyway!). Application architects will be encouraged by the support for a Web services and standards-driven approach taken by the product team, while systems administrators will benefit from the tight integation between Liquid Data and WebLogic, thus enabling seamless administration. Developers will find the Liquid Data control in the WebLogic Workshop IDE convenient, and they will particularly appreciate the sophisticated code-generation capabilities, which can significantly reduce coding for such related tasks as Web services and data access and excavation. Finally, performance engineers may want to avail of the query caching feature, which provides potential performance benefits.

The benefits of an information integration tool such as Liquid Data are not restricted to the technical team, however – in fact, the ultimate benefit is to the business community. The ability to integrate conventional data sources such as relational databases and mainframe applications, together with more contemporary (may I say post-modern, as in art?) sources such as XML and Web services, will help enterprises protect existing investment as well as leverage it to gain greater information awareness and competitive advantage.

While there are numerous benefits in using Liquid Data, there are other considerations and concerns to be aware of. For example, tight integration of Liquid Data with the BEA WebLogic application server will restrict using Liquid Data with other application servers. In addition, the Liquid Data release notes mention limitations in the ability of Liquid Data to support certain vendor-specific relational database features this may be an inhibiting factor for widespread deployment. Data mapping is a complex endeavor and requires correspondingly complex capabilities. Data mapping in the Data View Builder also accommodates data transformation, typically required to map different definitions of the same data attribute across disparate systems/sources. Finally, it appears that Liquid Data is designed to render data in one direction only – from data source to consumer, and cannot be used for data updates or data maintenance. (*Editor's note:* While Liquid Data alone does not support data updates, they are possible within the same Web application or Web service using other components of the BEA Platform [e.g., Workshop controls and/or WebLogic Integration processes for complex cross-source updates].) This has both advantages and shortcomings, and should be considered in a case-specific manner.

Conclusion

On balance, BEA Liquid Data is clearly a square peg in a square hole. The product is well designed, fulfills its stated purpose well, and satisfies an immediate business need. For J2EE shops in general and BEA WebLogic shops in particular, Liquid Data is a must-see, if not a must-have.

Acknowledgements:

My thanks to Anand Barhate (anand_barhate@hotmail.com) for his help in deploying and testing Liquid Data for this review.

AUTHOR BIO

Rajan Chandras is a principal consultant with the New York offices of CSC Consulting (www.csc.com). The article is written in his personal capacity and not on behalf of or representing CSC.

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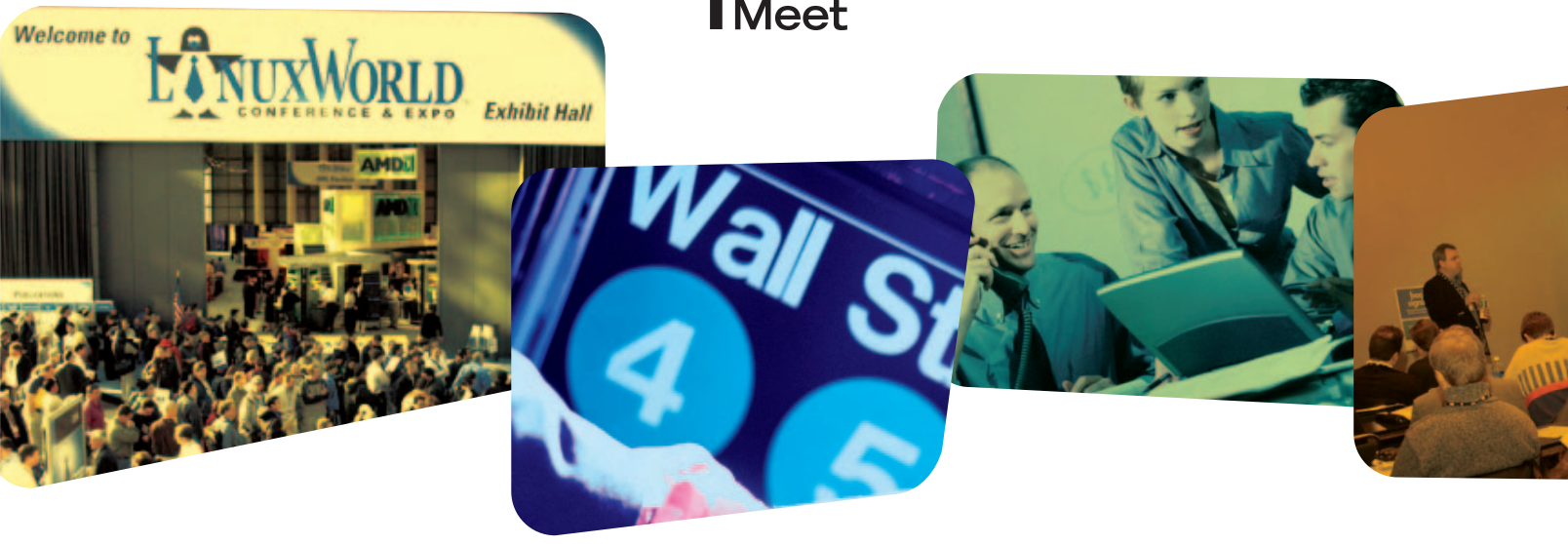

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Wednesday, January 21
9:15 am – 10:00 am

Dave Dargo
Vice President, Linux Program Office, Oracle
Wednesday, January 21
11:45 am – 12:30 pm

Tom Killalea
Vice President of Infrastructure, Amazon.com
Wednesday, January 21
2:45 pm – 3:30 pm

Sam Greenblatt
Senior Vice President and Chief Architect, Computer Associates Intl.
Thursday, January 22
11:30 am – 12:15 am

Ross A. Mauri
General Manager, e-Business on demand, IBM Systems Group
Thursday, January 22
1:45 pm – 2:30 pm

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IDG WORLD EXPO

I know what you're probably thinking as you look at the title of this article: "software reuse – been there, done that, and it doesn't work…."

Software Reuse Is Dead, Long Live Software Reuse

MAKE YOURSELF A HERO

BY BRENT CARLSON

AUTHOR BIO

Brent Carlson is vice president of technology and cofounder of LogicLibrary. He is a 17-year veteran of IBM, where he held numerous leadership roles on the "IBM SanFrancisco Project," a consortium of more than 100 companies united by the mission to provide a framework for Java-based application business components. Brent is the co-author of two books and holds 16 software patents, with eight more currently under evaluation.

CONTACT...

brent.carlson@logiclibrary.com.

And it's true that many a software architect or project leader on a WebLogic project has broken his or her pick on the slag heap of reuse efforts and that the legacy of monolithic CASE tool suites has left a bad taste in many developers' mouths when it comes to developing reusable software. So, what has changed to make software reuse feasible today? Three key factors make software reuse initiatives worth considering or reconsidering at this juncture:

- Mature, component-based development environments
- Web services and service-oriented architectures
- Software engineering processes and tools oriented towards reuse

I'll be discussing why each of these factors makes a difference towards the goal of effective software reuse, and why, in many cases, they combine with business factors to make a software reuse initiative a mandatory part of standard operating procedure in a rapidly increasing number of IT organizations.

Mature, Component-Based Development Environments

As we look at the past 20 years in software development, we see steady progress being made, both in the sophistication of programming techniques and the language-specific services being made available to the developer. From the early days of C, with its limited set of standard libraries and very much of a do-it-yourself mentality, to structured programming initiatives, to the early days of widespread object-oriented programming, to CORBA's distributed component infrastructure and services to today's modern J2EE and .NET component infrastructures, we can identify some major elements that make building and consuming reusable software feasible.

Structured programming techniques contributed to the notion of *well-defined functional contracts* to be consumed by callers of a module. Defining a contract in terms of its preconditions, expected input and output parameters (including the semantics of those parameters), side effects, and any exception conditions that may result from invocation of the function being described went a long way towards instilling a clean delineation between caller and invoked module.

Object-oriented programming introduced the concepts of *data encapsulation* and *polymorphism*, each of which contributed to effective software reuse. Data encapsulation freed the caller of an object from exposure to the underlying data structures used to manage persistent data and allowed the information being passed on a method call to be aligned more precisely with the caller's objectives. Polymorphism enabled the developers of a class to provide meaningful abstractions combined with underlying flexible implementations tuned to specific algorithmic needs, while allowing the calling code to be effectively decoupled from those implementations.

Taking the notion of decoupling one step further, distributed component technology provided developers with the ability to define and deploy *coarse-grained component interfaces* whose underlying implementations assembled a cluster of cohesive operations dealing with common data and functional objectives. While the tools provided with early component infrastructures such as CORBA were limited, and developers often had to be "rocket scientists" to get everything to work together correctly, when done right, the resulting deployed component landscape provided an efficient, flexible, and reusable application infrastructure.

Finally, the maturity of the two major component architectures, J2EE and .NET, gave developers a rich and stable platform upon which to build and deploy their components. The technical services provided by these two architectures, such as transactional integrity, messaging and directory services, security, exception processing, remoting, and many others make it possible for developers to focus on the function of their components rather than all of the underlying technical infrastructure required to make them work.

Web Services and Service-Oriented Architectures

I'm sure some of you are wondering, "Aren't Web services synonymous with service-oriented architectures? What exactly is a service-oriented architecture and how does it differ from Web services?" Simply put, a service-oriented architecture is one in which application functions are consolidated and presented in a loosely coupled form independent of their underlying implementation. These loosely coupled services typically present coarse-grained capabilities that are meant to be assembled together through some form of messaging runtime.

With that said, many, if not most, service-oriented architectures take advantage of the Internet-based Web service infrastructures being implemented and promoted by the major application server vendors. Web services and service-oriented architectures encourage – in fact, they demand – reuse by their very nature, as the sole purpose of a service is to expose a set of functional capabilities to multiple consumers. If that isn't reuse, then what is? In addition, because services are meant to be deployed once and accessed in place, they encourage the notion of business process assembly that crosses application boundaries – weaving together a series of services in support of a business process that may be described through a graphical design–time user interface. While the tools and underlying mechanisms to support this notion are still in their infancy, initiatives such as BPEL4WS (Business Process Execution Language For Web Services) show great promise in enabling this form of application development. Although it's unrealistic to expect that graphical application assembly will ever fully take the place of other development techniques, it will certainly take its place alongside those techniques and, in the process, encourage more effective reuse of underlying services.

> "Great strides have been made in the past decade toward more disciplined and effective software development processes"

Services and components also have a very symbiotic relationship that supports software reuse. Components are often the underlying mechanism behind a service, either fully implementing the functionality defined by the service or providing the necessary glue code to connect the modern Web service infrastructure with one or more legacy systems.

Software Engineering Processes and Tools

Great strides have been made in the past decade toward more disciplined and effective software development processes. Iterative methods such as RUP (Rational Unified Process) encourage early discovery, implementation, and refinement of key requirements. Incremental enhancements delivered on a regular and timely basis are a far cry from the heavyweight waterfall methodologies that typically resulted in late delivery of software that didn't meet user needs, not the least because those user needs changed from the time the original requirements were defined.

RUP and other modern software development processes encourage reuse by injecting specific software development asset (SDA) search and reuse review checkpoints into the development process. These search-and-review activities occur at all levels of the development life cycle from initial requirements definition, through analysis and design, and down to implementation. Modern UML-based modeling techniques also encourage reuse by providing analysts and developers with a concise, graphical means to crisply define functional requirements. Requirements in this form can then be consumed by other development tools such as code generators, mapping engines, and asset metadata repositories. UML-based IDE tools can be used not only to create UML but also to apply reusable knowledge SDAs such as design patterns to the resulting code, automatically preserving consistency between source code and model.

The Business Case for Reuse

With these tools and techniques in hand, and with IT budgets continuing to experience strong cost-cutting pressures, it's hard not to see the justification for a reuse initiative within an IT organization of any size. Dr. Jeffrey Poulin, noted software industry reuse expert, has compiled numerous studies that indicate reuse payback occurs on the first reuse of an SDA, even taking into account the extra effort required to build the asset for reuse. Michael Blechar, vice president and research director at Gartner Research, states, "Enterprises can substantially improve application development productivity and quality, while also decreasing time-to-market, by a factor of 5:1 or more through a committed software asset reuse program. At the heart of this initiative must be the ability for analysts and developers to easily locate and reuse these assets." Take the time to investigate the tools available to you to encourage reuse. (I'll cover process and tools in more detail in a future editorial.) Even something as seemingly simple as disseminating architectural guidance to development teams as UML models distributed through an asset metadata repository can produce significant payback in the form of code implemented using industry and organizational best practices, thus greatly reducing the chance of rewriting or experiencing heavy maintenance costs down the road. Adding the ability to define and distribute well-structured, coarse-grained components and services throughout your organization can accelerate productivity and, just as important, improve application consistency dramatically throughout your organization – and maybe make you a hero in the bargain!

The launch of BEA's WebLogic Platform 8.1 was greeted with enthusiasm by industry analysts and IT practitioners alike, who recognized its potential to open up the power of the J2EE platform to a much broader spectrum of developers.This allowed J2EE architects to do what their skills are best suited for – architectural design and technical problem solving – while allowing the architectures designed by the experts to be used by the "ordinary" developers, who hitherto had been restricted to building departmental-scale applications because of the lack of an architecture for scalability underpinning the applications they produced with the "more accessible" tools they were accustomed to using.

Transactions: Are You in Control?

ROCKET SCIENCE PAYS OFF AT THE END

BY **PETER HOLDITCH**

AUTHOR BIO

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Two key features of the WebLogic Platform enable this separation of duties between the high-level business developers and the highly technical J2EE architects – the BEA WebLogic Workshop runtime, which imposes some high-level architectural order on the high-level business developers; and the Workshop development environment, which allows the developers to interact with the environment via a consistent graphical abstraction, turning to lines of code only when they need to express some business rule, not when they try to assemble an application. The IDE also has a feature to help the architects – they can produce a skeletal application environment, populated with standard components, etc., and release that to the other developers as a template, getting the business programmers off to a flying start (and importantly, a flying start consistent with development standards and other development projects) in a pre packaged and automated way.

The key part of the runtime framework is the Controls architecture – controls provide a consistent way to encapsulate business logic. Business developers can code their business rules and provide them as components using controls, or to encapsulate complex logic and infrastructure needed to access some resource. J2EE architects can implement this "hard-core plumbing" and wrap it in a control that can then be used just as easily by the app developers as a piece of their own logic. This solves another problem that large development shops usually have – the J2EE coders produce lots of really excellent infrastructure, but it can only be consumed by other J2EE experts, because business developers don't understand how to use it.

Overall, from the J2EE developer perspective they get to avoid doing lots of dull, error-prone cut-and-pasting – let's face it, just another struts form front end, or just another code excerpt to look up a JMS queue in JNDI and send a message on it is nobody's favorite pastime. From the non-J2EE developer perspective, the assembly of a useful application from preexisting components (i.e., building another set of Web screens that combine existing subsystems in new ways) becomes possible without having to burn the midnight oil learning the J2EE incantations.

Transactions: Have You Lost the Plot?

So what on earth does that have to do with transactions? Well, nothing, it's just background. Without covering that, how can I write the article I wanted to? And what is that? Well…

Transactions, Workshop, and Controls

Controls are simply annotated Java objects – and it is these annotations that provide the magic that allows control users to work at a level of abstraction above the usual J2EE interface. When a control (which may actually be a composite of multiple controls) is deployed, the annotations drive the generation of the right runtime linkage (which is what is actually deployed). Like any other Java object, controls inherit their transactional context from the caller. Since controls have no concept of a remote interface (at least not in the current release), the caller is always a lightweight control container generated by WebLogic Workshop, which is itself contained by an EJB. If you look at the deployment descriptor associated with this (Workshop-managed) EJB, you will see that it has a transaction policy of "container" – so the transactional context of the controls will be provided by the EJB container, using JTA, just as if the control were a plain old Java object that you wrote and invoked from EJB code.

The nearest thing to a remote interface in Workshop is a Web service – it is very easy to take a control and expose it as a Web service (potentially, and a conversational Web service) with no more than a few mouse clicks, so the remaining question becomes…

What Is the Default Transactional Behavior of a Workshop Web Service?

Each time a call comes in to a Web service method, the linkage from message arrival to invocation has been done through a number of bits of J2EE machinery (depending on exactly what you have declared in the annotations), culminating in an EJB with conatiner-managed transactions. For the duration of the execution of the method, a JTA transaction will be in operation. If the method succeeds, the transaction commits. If the method fails (throws an Exception) the transaction will be rolled back. Easy so far.

Recall, though, that a WebLogic Workshop Web service can be conversational (again, if the annotations say it is). The conversation state is persisted in a database table. How does this persistent state relate to any application-managed persistent state? Well, it is included in the same transaction context. So if your method fails, it is as if that leg of the conversation never happened – the kind of nice, atomic behavior transactions are loved for. This has some implications on the deployment – by default, the conversation state is persisted via a data source called cgDataSource. If your application state is persisted elsewhere, you will get an error saying you can't infect your data source with the transaction because it already infects the cgPool underlying the cgDataSource. You can fix this in two ways: either change cgPool to use xa database access and get a two-phase commit, or have both the conversation state and your application state held in the same database instance via the same connection pool (Workshop's jws-config.properties file controls this from the Workshop perspective) and avoid the need for a two-phase commit.

If a Workshop Web service calls another Web service, the transaction context will not be propagated so the called service will run in its own new transaction according to the rules I just outlined. If you would like the failure of a service call to roll back the caller's transaction, rethrow the exception to the framework. If you want the caller's state (both application and conversational) to be persisted in spite of a Web service call failure, catch the exception and don't re-throw it.

Of course, the usual rules about transactions apply. If you want something (say an audit record) persisted irrespective of the transaction's eventual outcome, then you need to get the TransactionManager object and suspend the transaction before making the call and resume it afterwards. This is getting hairy for a non-J2EE guru type, which makes it exactly the kind of thing the J2EE architects should implement and provide to the application developers as a prebuilt Control.

The Key Is, It Doesn't Matter!

So the last few hundred words were all a bit rocket-science like (or at least, a bit close to rocket-science like) for many application developers. Well, that's the point. If the J2EE architects understand this stuff, and bear it in mind when they put together templates and development guidelines for the app developers, then the app developers shouldn't need to worry about it – the framework will do the right thing on their behalf, and they will produce more applications more quickly whose behavior will be more consistent than they could have hoped for without the framework and the templates steering them in the right direction. All of which might even mean an IT department that can smile and say yes the next time the business changes the requirements again at the last minute, rather than muttering something about dilithium crystals and updating its résumé!

"It is very easy to take a control and expose it as a Web service (potentially, and a conversational Web service) with no more than a few mouse clicks"

References

- *John Methot's white paper on BEA WebLogic Workshop internals:* http://dev2dev/products/wlworkshop81/articles/wlw_internals.jsp. This covers the runtime implementation of the Workshop framework, and how it can be configured to behave differently in more detail than there is space for here.

Do You Know What You Run?

A HANDY REFERENCE TO FINDING YOUR LOG FILES – AND YOUR SERVER VERSION

BY **ALEXANDRE RAFALOVITCH**

AUTHOR BIO

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Very large organizations know the value of spending a little (or a lot of) extra money to be in total control of the information. The rest of us have probably run into situations where the server version in production may or may not be exactly the same as the one in the QA section and would most certainly run at different log and debug settings from the server developers are working with. This article will cover the common ways to check basic WebLogic information, including versions and log locations. Knowing exactly what you run will also allow you to speed up that inescapable initial exchange of information with your BEA support engineer and allow him or her to get past configuration and into the technical depth of the actual issue.

Versions, Service Packs, and Rolling Patches

The official numbering for the BEA WebLogic product family is MajorVersion.MinorVersion.-ServicePack.RollingPatch. Usually, you'll only hear about MajorVersion.MinorVersion in the press releases (e.g., 5.1, 6.0, 6.1, 7.0, and 8.1 for the WebLogic Server), but of course it is the ServicePack that gets the most workout in day-to-day server maintenance and administration.

Some confusion was introduced by BEA's new policy of Weblogic Platform releases in parallel with the stand-alone BEA WebLogic Server releases. Specifically, BEA WebLogic Platform 8.1 is actually built on the WebLogic Server 8.1sp1 and all the components are versioned at 8.1.1.0.

On the other hand, the rolling–patch was last seen at the time of WebLogic 6.0 and let us hope that was the last time.

In addition to the official numbering, there are also one-off (temporary) patches. Any number of them may be applied at the same time since they don't influence the version number, but sometimes it is very important to know exactly which patches are applied.

One important thing to remember about temporary patches (CRxxxx_spX.jar) is that they are specific to the release/service pack version. Trying to use a patch from an older service pack in the newer one can have disastrous effects – some more obvious than others. Listing 1 is an example of applying a WebLogic Server 7.0sp1 patch on the WebLogic Server 7.0sp2 version.

No problems, right? No problems in the server log version either. Then why does WebLogic Server recompile the JSPs that were already precompiled by the same version of WebLogic? The answer is in the console's version information (see Figure 1).

Notice that the Server Release Build value is suddenly transposed into 7.0.1.0 (WebLogic Server 7.0sp1). This is what the JSP compiler checks to determine the need to recompile the JSPs and it is a direct effect of an incorrect patch.

How to Skin a Cat (or Checking Version Numbers)

So, how many approaches are there to check for version number? Let us count the ways.

Remotely

Both of the following methods are good for system administrators who have access to and are comfortable with the WebLogic Server, but don't necessarily have access to the machine on which the WebLogic Server runs. After all, with Node Manager and the admin console, it's easy enough to install the server once and throw away the key (account password, that is).

WebLogic Console

This is the easiest and most complete method of getting the versions. You can find it in the Weblogic Console under Console/[Versions] tab. Figure 2 is the screenshot for the WebLogic Server 8.1sp1 (Platform install).

As you can see, the versioning information is very complete. It may also be slightly confusing with multiple components installed. The important thing to remember here is that unless you explicitly expect otherwise, the version numbers for all components should match.

WEBLOGIC.ADMIN VERSION

For those of you who like command lines, weblogic.Admin command provides a VERSION option that will return the equivalent of the last entry set in the console display (see Listing 2).

Onsite

The previous section was good for remote administration. What if you're already on the system and working with the files? Perhaps your WebLogic instance is down or you are support personnel and are actually working with somebody else's files. What options do you have then? Quite a few actually.

SERVER LOG

A lot of the information may be found in the server log files, the version strings section being one of them. You can find the section (message BEA-000214 for WebLogic Server 8.1) near the beginning of the run's log, It looks similar to Listing 3.

Notice that as in our previous example of the bad patch, there is no information provided about the version the patches were for. You can, however, extract that information later in the log by looking at the java.class.path in the logged system properties (WebLogic Server 8.1 Message ID: BEA-141034). All the valid BEA patches will have server version information as part of the patch name (e.g., CR123103_81sp1.jar). All of the third-party or invalid patches will, hopefully, stand out exactly because they are missing that information and naming convention.

ODD PLACES

If you don't have the administrative access to the WebLogic Server, or all the server log files for the last run start have rolled over and were deleted/archived away, you can get a rough idea of what you are up against from various places in your installation.

From the start scripts, you can often tell a general version of WebLogic (based on WL_HOME) and the patches applied (look for CLASSPATH and PRE_CLASSPATH).

Starting with WebLogic 7, the config.xml may contain a ConfigurationVersion attribute in the Domain tag and a ServerVersion attribute in the Server tag. Both attributes, however, are used more for compatibility indication, so use them as an indication of what the server version is not. For example, if you see

```
<Domain ConfigurationVersion="7.0.2.0" Name="managedDom">
```

chances are very high that you are running a WebLogic 7 SP2 or higher. It could, of course, still be WebLogic 8.1 in a compatibility mode, so take this value with a grain of salt.

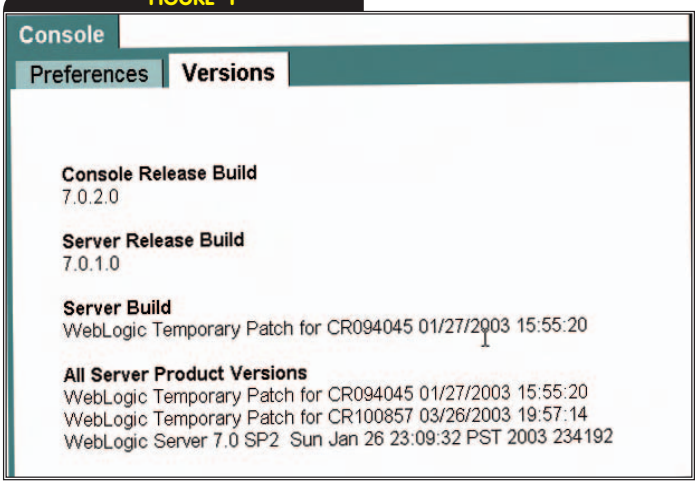
The last odd place to cover is the new domain-info.xml file that WebLogic 8 installs in the domain directory when configured from templates (e.g., WebLogic Configuration Wizard). The file contains the list of base templates and extensions installed over the domain's lifetime. Again, this is more curiosity than a real information source (but don't say we haven't tried to cover for the difficult cases).

Log File Names and Locations

A running WebLogic instance will generate many log files. Table 1 is a list of the core log files. Each extension (Integration, Portal, Workshop, etc.) will also have its own list of logs and should be covered separately (see Table 1).

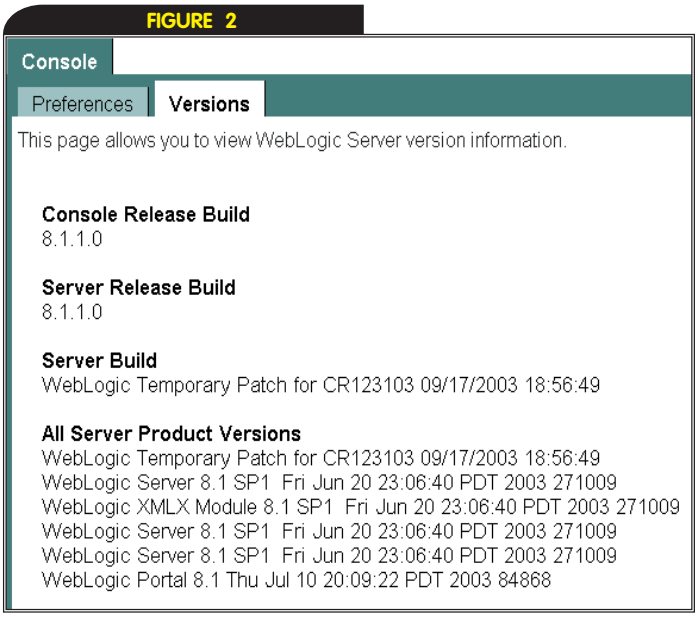
The interesting thing about a server log (and probably BEA products in general) is that in the chase for ever better and ever more useful functionality, the formats and locations of log files keep changing. This especially hits hard those people who are used to running on one version of WebLogic and then upgrading to the latest release. I'm not even going to mention the plight of us – the BEA support personnel – who support at least four versions of

FIGURE 1



Console version information

FIGURE 2



BEA WebLogic Server 8.1sp1

TABLE 1

LOG TYPE AND THE XPATH IN THE CONFIG.XML	TYPICAL LOG NAME	USEFULNESS
Domain log//Domain/Log/@FileName	<domainname>.log	Useful in the clusters to monitor bird's eye view of the system.
Server log//Server/Log/@FileName	weblogic.log (WLS 5.1, 6.1) or <servername> .log (WLS 7.0, 8.1)	All the server's settings and changes are here. Invaluable, if sometimes hard to follow.
stdout/stderr redirects	Customer's choice	If you aren't redirecting stdout/stderr into a separate file, start doing it. This is where thread dumps and JVM error messages go. It's next to impossible to solve hanging/crashing issues without this one.
Access log //Server/WebServer/@LogFileName	access.log	Show all the requests made. It is often underappreciated, but there is no better way to check HTTP load balancing and failover with a multiple server setup.
Jdbc debug log //Server/@JDBCLogFileName	jdbc.log (if enabled)	A debug log for the JDBC drivers. It is very low level and verbose. Usually only useful to check generated SQL and/or compare to another copy of jdbc.log that records what should be the same task/test, but is not.
Transaction log //Server/@TransactionLogFilePrefix	<servername>.XXXX.tlog and <servername>. heur.XXXX.tlog (XXXX is a zero-leading number)	This is actually a binary log for WebLogic's internal JTA use. It should not be archived or deleted.
Proxy plugin log	Wlproxy.log	Generated by the proxy plugin when the debug is enabled. Useful for troubleshooting failover, sessions, and HTTP stream problems. Very verbose and low level.
iPlanet LDAP access.log	access.log	This is not a BEA log, but I feel Sun needs to be congratulated for a useful log that allows you to make troubleshooting any iPlanet authentication issues easy.

Core log files

WebLogic (5.1 onwards) on top of template and customers variations.

Following is a quick list of server log–related quirks that may have wasted your time in multiversion environments.

- The default location of the server log file is in <domain>/<servername> for WebLogic Server 5.1, 7.0, and 8.1, but <domain>/logs for WebLogic Server 6.1. To add to the confusion, WebLogic Server 7.0 may have a zero-sized weblogic.log file in the <domain>/logs that is actually a dummy and will never be written to.
- With WebLogic 8.1 in a development mode, a log file will be automatically rolled over at server startup regardless of the current file size. This and other differences between production and development mode are described at http://e-docs.bea.com/platform/docs81/confgwiz/newdom.html#devprod.
- When the log file is rolled over, the archived file will change its extension to .logXXXXX (e.g., myserver.log00001), even while transaction logs (for example) will use the more appropriate myserver.XXXX.tlog. This is especially challenging to the Windows administrators, where the file extension mappings are very important.
- To find the beginning of the log (e.g., to check the version info), the best line to search for in WebLogic Server 5.1 through WebLogic Server 7.0 is "FileLogger". As in:

```
####<29/10/2003 7:53:49> <Info> <Logging> <arafalov01> <myserver> <main>
<> <> <000000> <FileLogger Opened.>
```

- WebLogic 8.1 has improved its internationalization and it is now unwise to rely on the text message itself. The message ID is a better reference. BEA-170019 is WebLogic 8.1's equivalent to the FileLogger and will usually read as shown in Listing 4.

Conclusion

Do you know what you run right now? Perhaps not all aspects, but with a solid knowledge of how to detect the exact server version and a handy reference to the location of all the log files, you're on your way to becoming the Master of WebLogic. Good luck!

Listing 1

```
...>java weblogic.Admin -t3://localhost:7001 -username system -password
password VERSION
WebLogic Temporary Patch for CR094045 01/27/2003 15:55:20
WebLogic Temporary Patch for CR100857 03/26/2003 19:57:14
WebLogic Server 7.0 SP2 Sun Jan 26 23:09:32 PST 2003 234192
```

Listing 2

```
...>java weblogic.Admin -url t3://localhost:7001 -username system -pass-
word password VERSION
WebLogic Temporary Patch for CR123103 09/17/2003 18:56:49
WebLogic Server 8.1 SP1  Fri Jun 20 23:06:40 PDT 2003 271009
WebLogic XMLX Module 8.1 SP1  Fri Jun 20 23:06:40 PDT 2003 271009
WebLogic Server 8.1 SP1  Fri Jun 20 23:06:40 PDT 2003 271009
WebLogic Server 8.1 SP1  Fri Jun 20 23:06:40 PDT 2003 271009
WebLogic Portal 8.1 Thu Jul 10 20:09:22 PDT 2003 84868
```

Listing 3

```
####<4/11/2003 09:26:30 PM EST> <Info> <WebLogicServer> <arafalov01>
<cgServer> <main> <<WLS Kernel>> <> <BEA-000214> <WebLogic Server
"cgServer" version:
WebLogic Server 8.1 SP1  Fri Jun 20 23:06:40 PDT 2003 271009
WebLogic XMLX Module 8.1 SP1  Fri Jun 20 23:06:40 PDT 2003 271009
WebLogic Server 8.1 SP1  Fri Jun 20 23:06:40 PDT 2003 271009
WebLogic Server 8.1 SP1  Fri Jun 20 23:06:40 PDT 2003 271009
WebLogic Portal 8.1 Thu Jul 10 20:09:22 PDT 2003 84868 (c) 1995, 1996,
1997, 1998 WebLogic, Inc.
 (c) 1999, 2000, 2001 BEA Systems, Inc.>
```

Listing 4

```
####<29/10/2003 07:55:29 AM EST> <Notice> <Log Management> <arafalov01>
<myserver> <main> <<WLS Kernel>> <> <BEA-170019> <The server log file
C:\bea\wlplat81\user_projects\domains\wldj-server\myserver\myserver.log
is opened. All server side log events will be written to this file.>
```

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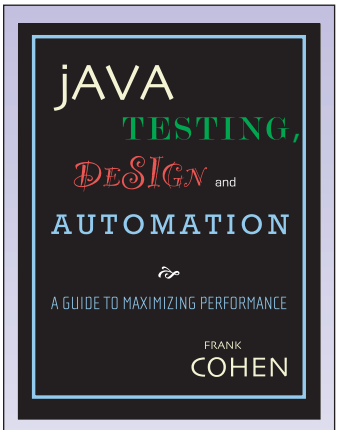
BOOK EXCERPT

Making the Right Choices for SOAP Scalability

FROM CHAPTER 14

BY **FRANK COHEN**



Book info:
Java Testing, Design and Automation
Prentice Hall Publishing
ISBN 0131421891

Price:
$49.95 U.S.D
http://thebook.pushtotest.com

Publication date:
February 2004

Software developers live in a time that offers the greatest choice of software development tools, application servers, and connectivity ever. Each choice you make affects the scalability and reliability of your finished application, especially if you're building Web services. For example, as you will learn in this article, my study of SOAP encoding styles found a 30-fold performance improvement by choosing one SOAP encoding style over the others. By understanding the performance impact of SOAP encoding styles, Web service development tools, application servers, and platforms, our choices greatly improve system performance.

This article presents results of an investigation that shows how each choice immediately impacts scalability and reliability. It discusses the impact of letting development tools make choices for us on scalability and performance. Then it presents directions, tools, and test agents to stage tests in your own environment.

Why Is SOAP So Popular?

In my experience, when independent technology innovations intersect, the world enjoys life-changing products, services, and techniques. For example, the light bulb required both electricity generation and filament fiber technology. In the case of Web services, enterprise information technology managers had just come off a multi-year binge where they bought huge numbers of computers, servers, routers, and other Web infrastructure. Left with a recession, terrible stock market, uncertainty about the world economy, and having to contend with terrorism and SARS, these information managers returned to their existing Web infrastructures to increase the productivity of their teams through new software projects.

At the same time, most software developers realized they really liked XML. For example, XML was much better than using the Microsoft Windows Registry or text-based property files to store and describe application data. Software developers saw a good thing in XML and wanted to find more ways to use XML in their applications.

As a software developer I began noticing application programming interfaces (APIs) that expected to receive a value that contained XML encoded data. For example, when building a portal system for Sun Microsystems I found that the servlet to create a new user account received the fields that made up the user contact information (email, address, and telephone number) in an XML document. Rather than pass one value in at a time to a method, instead the method took one XML value that contained several values. Using XML to implement an application's interfaces is a clear win to developers. Plus, these XML-described interfaces could work across platforms and programming languages. With XML everything looks like an interface.

These intersecting technologies power the widespread enthusiasm for Web services. At the same time, software developers were again experimenting with software architectures, especially with the location of application business logic and presentation code. Presentation code handles windows, mice, keyboard, and other user interactions. Business logic is the instructions that define the behavior and operation of an application.

The first-generation software architecture built the presentation and business logic on a single system. In the second generation, client/server architecture brought back the large, centrally controlled datacenter so familiar in the 1960s, when mainframes ruled the information world. In client/server architecture the desktop system is a "dumb" terminal that only needs to display the data provided by the server. The early Internet was modeled after client/server architecture, where the browser made a simple request to a server. As browsers improved in functionality – applets, JavaScript, ActiveX, DHMTL were introduced – some systems included business logic on the desktop side. However, the majority of function remained on the server.

The age of "Grid Computing" is upon us, where an application hosts business logic modules on the desktop or server. The modules discover each other using UDDI and P2P technologies. Also, multiple copies of the business-logic modules may run in a grid of data centers to allow failover, dynamic routing, and functional specialization. All of these architectures run in a Web environment and can host Web services.
So even if SOAP-based Web services are replaced with some other type of Web service technology,

remote procedure calls using XML-encoded data will be around for a very long time.

SOAP Encoding Styles

SOAP uses XML to marshal data that is transported to a software application. Most of the time, SOAP moves data between software objects, but the SOAP specification was intended to be useful for old legacy systems as well as modern object-oriented systems. Consequently, SOAP defines more than one data-encoding method to convert data from a software program into XML format and back again. The SOAP-encoded data is packaged into the body of a message and sent to a host. The host then decodes the XML-formatted data back into a software object.

Since SOAP's introduction, three SOAP encoding styles have become popular and are reliably implemented across software vendors and technology providers:

- ***SOAP Remote Procedure Call (RPC) encoding,*** also known as Section 5 encoding, as defined by the SOAP 1.1 specification and later defined in SOAP 1.2 as RPC encodings and conventions
- ***SOAP Remote Procedure Call Literal encoding (SOAP RPC-literal,)*** uses RPC methods to make the call but uses an XML do-it-yourself method for marshaling the data.
- ***SOAP document-style encoding,*** also known as message-style or document-literal encoding.

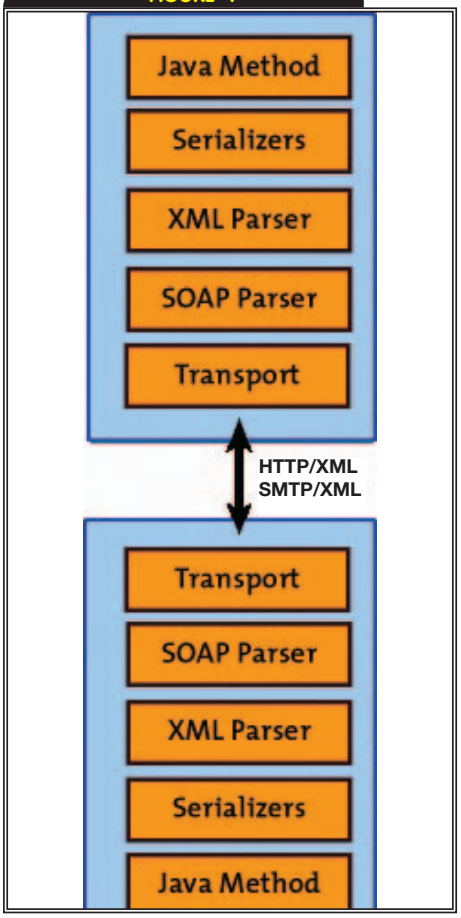
There are other encoding styles, but software developers have not widely adopted them, mostly because their promoters disagree on a standard. For example, early on in the invention of Web services Microsoft promoted Direct Internet Message Exchange (DIME) to encode binary file data, while the rest of the computer industry adopted SOAP with Attachments. SOAP RPC encoding, RPC-literal and document-style SOAP encoding have emerged as the encoding styles that a software developer can count on.

Some developers do not realize that such encoding styles exist because the tools they use to develop Web services are doing the work of implementing the encoding styles for the developer. For example, BEA WebLogic Workshop provides a fast and efficient implementation of the Java Web Service (JWS) interface. JWS implements a set of application programming interfaces (API) and a standard description of the files the JWS engine needs to automatically deploy the Web service on the server. JWS builds the Web service deployment descriptors for you automatically. So you need to only define the public Java methods and JWS publishes the SOAP proxy to access the methods. This makes development appear very easy, but there is a lot of work going on under the covers, so to speak. We'll see this in more depth later in this chapter.

Before I discuss SOAP encoding style's impact on performance, you should understand the differences between these styles of SOAP encoding. Figure 1 shows the entire stack for a SOAP RPC encoded call.

SOAP RPC is the encoding style that offers the most simplicity for developers. The developer makes a call to a remote object, passing along any necessary parameters. The SOAP stack serializes the parameters into XML, moves the data to the destination using transports such as HTTP and SMTP, receives the response, deserializes the response back into objects, and returns the results to the calling method. Whew! SOAP RPC handles all the encoding and decoding, even for very complex data types, and binds to the remote object automatically.

FIGURE 1



A Java method calls a Web service by using the SOAP stack and SOAP RPC encoding

Now, imagine you are a developer with some data already in XML format. SOAP RPC also allows literal encoding of the XML data as a single field that is serialized and sent to the Web service host. Since there is only a single parameter -– the XML tree – the SOAP stack only needs to serialize one value. The SOAP stack still deals with the transport issues to get the request to the remote object. The stack binds the request to the remote object and handles the response.

Lastly, in a SOAP document-style call, the SOAP stack sends an entire XML document to a server without even requiring a return value. The message can contain any sort of XML data that is appropriate to the remote service. In SOAP document-style encoding, the developer handles everything, including determining the transport (e.g., HTTP, MQ, SMTP), marshaling and unmarshaling the body of the SOAP envelope, and parsing the XML in the request and response to find the needed data.

The three encoding systems are compared in Figure 2.

SOAP RPC encoding is easiest for the software developer; however, all that ease comes with a scalability and performance penalty. SOAP RPC-literal encoding is more involved for the software developer to handle XML parsing, but requires fewer overheads from the SOAP stack. SOAP document-literal encoding is most difficult for the software developer, but consequently requires little SOAP overhead.

Why is SOAP RPC easier for the developer? With this encoding style, you only need to define the public object method in your code once; the SOAP stack unmarshals the request parameters into objects and passes them directly into the method call of your object. Otherwise, you are stuck with the task of parsing through the XML tree to find the data elements you need, and then you get to make the call to the public method.

There is an argument for parsing the XML data yourself: since you know the data in the XML tree best, your code will parse that data more efficiently than generalized SOAP stack code. As we will see when we measure scalability and performance in SOAP encoding styles, we will find this to be the case.

But before I go further into that, we look at how enterprise information systems managers are coming to grips with SOAP encoding styles and scalability.

Simple Object Access Needs Simple Testing

Elsevier (www.elsevier.com) is the leading research content publisher for the sci-

ence, technology, and medical industries. Elsevier now uses a content-publishing platform that uses SOAP to build application programming interfaces. Elsevier's information managers need to know if their choices of SOAP encoding style will scale and perform to handle millions of transactions every day. Their decisions affect how Elsevier will invest capital in new infrastructure. Over time, they need to know how new releases of their own software, new releases of application server software, and platform changes will affect scalability and performance.

Elsevier learned about TestMaker through the open source community and contacted PushToTest (www.pushtotest.com) to see if TestMaker was appropriate for their testing needs. Elsevier asked PushToTest to conduct an independent audit of SOAP stacks and encoding styles to answer their questions about system performance and scalability. PushToTest delivered a Test Web Service (TWS) that handles RPC, RPC-literal, and document-style SOAP messages and runs on a variety of application servers. The environment is completed with a set of intelligent test agents to check TWS for scalability and performance.

TestMaker checks Web services for scalability, performance, and reliability. Software developers, QA analysts, and IT managers use TestMaker to build intelligent test agents that implement archetypal user behavior. The agents drive a Web service using native protocols (HTTP, HTTPS, SOAP, XML-RPC, SMTP, POP3, IMAP) just as a real user would. Running multiple intelligent test agents concurrently creates near-production-level loads to check the system for scalability and performance.

In addition to checking SOAP encoding scalability, the Elsevier test environment provides a benchmark specific to Elsevier's systems to show a performance comparison for a variety of application servers and platforms. For example, TWS is currently implemented to run on IBM WebSphere, BEA WebLogic Workshop, and the SunONE Application Server. I am confident that ports to MindElectric's Glue, Apache Axis, Systinet WASP, and other application servers is straightforward.

I built the Elsevier test environment by customizing TestMaker to support SOAP RPC, SOAP RPC-literal, and SOAP document-style requests, and by implementing TWS to respond to requests in these encoding styles. The request to TWS contains two parameters: the first defines the size of the response and the second defines a delay value before responding. TWS responds by creating a response document containing random gibberish words that appeared in five response elements; each element has one child element. A TestMaker test agent uses the Apache SOAP library to make requests to TWS. The test agent varied the number of concurrent requests to TWS and the payload size of the response. The test agent logged the results to a delimited log file, which was subsequently summarized by a tally script. The tally script determined the number of transactions per second (TPS) performed by the test by counting the duration of successful transactions. We defined success as the absence of transport or SOAP faults.

With Sun Microsystems support, I ran the tests on Sun Solaris E4500 servers with 6 CPUs and 4 GB of RAM. The Test Web Service (TWS) used the SOAP stack provided by the underlying application server. For example, WebSphere provides Apache SOAP, BEA WebLogic provides their own implementation that uses the JAX-RPC APIs, and the SunONE Application Server uses the Java 1.4 JAX-RPC library. On the client side, Test-Maker uses the Apache SOAP library.

In the Elsevier project, I found that a developer's choice of encoding style determines to a large extent the scalability and performance of a Web service. The SOAP implementations universally showed scalability problems when using SOAP RPC encoding, especially as payload sizes increased, as illustrated in Figure 3.

The test agent recorded 294 transactions per second when making requests where the response SOAP envelope measured 600 bytes of SOAP RPC-encoded data. As the test agent increased the response size, the transactions per second plummeted. When making requests of 96,000 bytes of SOAP RPC-encoded data, the agent measured only 9.5 transactions per second.

When the test environment used SOAP document-style encoding the performance fared much better, With 600 bytes of document-encoded data, the test agent measured 469 TPS. Recall that the SOAP RPC-encoded requests gave us 294 TPS for requests of the same size. Additionally, when the test agent increased the response size, the TPS values did not degrade significantly when we used document-style encoded responses.

When the test environment uses SOAP RPC-literal encoding I found an efficient middle ground. RPC-literal provides the performance benefits of SOAP document-style encoding with a little more work required to parse through the XML data.

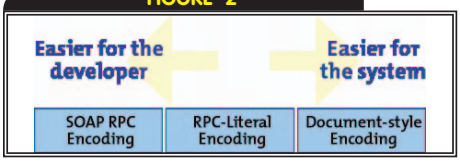
In my experience every production environment is unique. So, rather than try to be your answer guy for every application server and encoding style, I would like to give you a performance kit that you can download and use in your own production environment. I have made a generalized version of the Elsevier test environment available for free download for your immediate use at: www.pushtotest.com/ptt/kits/encodingkit.html.

Summary

In this article, we found that software developers have many choices for building Web service systems: SOAP-encoding styles, Web service development tools, and application servers. This chapter presented the results of an investigation that shows how each choice immediately impacts scalability and reliability.

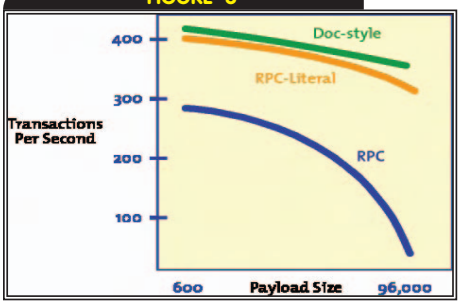
Elsevier adopted SOAP as their standard way to build their next generation content aggregation system. We saw how Elsevier developed a new methodology and test environment to check various SOAP implementations, including application servers, SOAP stacks, and utilities for scalability and performance.

FIGURE 2



SOAP encoding styles offer software developers greater productivity, but it comes at a performance and system resource cost

FIGURE 3



SOAP RPC encoding: Scalability problems become noticeable with increased payload sizes. Document-style encoding: Performance stays relatively stable with increased payload sizes. SOAP RPC-literal provides the performance benefits of SOAP document-style encoding with a little more work required to parse through the XML data