AMSeT Workflow Toolkit

Developer Guide (or User Guide for Developers)

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About this document

This is a deliverable from the JISC Alfresco Management and Security Toolkit (AMSeT) project which was funded from the Repositories: Rapid Innovation strand of the 12/08 JISC Information Environment and e-Research call and ran from 1 April to 30 September 2009.

Who should read this document?

This document is intended for developers who wish to use the NetBeans IDE and GlassFishESB to create Web service workflows involving the Alfresco content management system.

Introduction

The AMSeT Alfresco Web service workflow output consists of a set of *atomic* NetBeans BPEL workflows using Alfresco Web services together with a NetBeans AMSeT Workflow Toolkit (AWT) project that simplifies the creation of Alfresco BPEL workflows

The term *atomic* might seem inappropriate to be applied to workflows, but in this case it is used to represent a basic unit of Alfresco functionality such as creating a folder or publishing content. Although the functionality can be regarded as atomic, the BPEL workflows themselves consist of several sequential operations. For example, to create a new folder the Authentication Service is first called to retrieve security credentials which are then used in a call to the Repository Service to create the folder.

These atomic workflows are intended primarily as examples that can be consulted for guidance on creating more extended workflows and how to populate SOAP requests for the Alfresco services.

A brief overview of the AWT project will be given in this document. The AMSeT wiki contains a screencast of the process of creating a simple Alfresco BPEL workflow.

Requirements

Software

This software requirements for the AMSeT workflow system are Java 6, NetBeans AMSeT Workflow Toolkit project, AMSeT atomic NetBeans projects, GlassFishESB 2.1 (incorporating NetBeans 6.5.1), Alfresco Labs 3 Final or Alfresco Community Edition 3.2, MySQL 5, and wsmonitor 1.1.

BPEL workflows were created using the NetBeans BPEL Designer module which conforms to the WS-BPEL 2.0 specification.

Hardware

The development environment was a PC (Windows XP SP3, 4 GB RAM, 2.1 GHz). The release of GlassFishESB v2.1 for Mac OSX was unable to recognise the normalised router property definitions and therefore Mac OSX cannot run the AMSeT workflow projects under the configuration given here. (The GlassFish ESB project moves very rapidly and it is possible that the problem has been solved in the nightly builds.) A possible workaround here is to use Windows XP running on Sun's VirtualBox.

Installation

NetBeans/GlassFishESB

GlassFishESB v2.1 install packages can be obtainied from the GlassFishESB site [https://open-esb.dev.java.net/]

Alfresco

Details on how to install Alfresco can be found on the Alfresco wiki [http://wiki.alfresco.com/w/images/2/2a/Installing_and_Configuring_Alfresco_ECM_Community_Edition_3_2_r.pdf].

wsmonitor

wsmonitor 1.1 (stable release) may be downloaded from the wsmonitor site [https://wsmonitor.dev.java.net/] at java.dev.net.

Running the command below in a command terminal will install the software.

```
java -jar wsmonitor-1.1.jar
```

AMSeT NetBeans Projects

The AWT project and the atomic workflows can be downloaded from the AMSeT SourceForge project site [http://sourceforge.net/projects/amset/].

Running the Atomic Workflows

BPEL and CA projects

A BPEL workflow is created in the NetBeans BPEL Designer as a *BPEL module* (a type of NetBeans project). In order for a workflow to be executed in GlassFishESB, a corresponding *Composite Application* (CA) project must be generated. This consumes the BPEL project as input. [This is called a *service assembly* in Java for Business Integration (JBI) parlance, the underlying ESB technology]. This is a simple process, essentially a drag-and-drop operation in NetBeans (see below).

Each CA project name in AMSeT has been derived from the base BPEL project by the addition of the letters `CA`. For example, the CA project corresponding to the BPEL project `mybpelproject` would be `mybpelprojectCA`.

A screencast is provided on the AMSeT wiki that provides some more information on these atomic workflows.

Alfresco

A live Alfresco installation is required to run the workflows. Also, a username and password from an Alfresco administration account are required to acquire a security token which is placed in the SOAP headers of subsequent Web service requests for the purpose of authentication.

Note that by default the administration username and password are transmitted across an unsecured HTTP connection. Obviously this should be borne in mind during testing. Before any workflow is put into production a secure connection will need to be established.

All AMSeT workflow development has been carried out on a remote Alfresco Web installation. This is probably the best model for a production system in a service-oriented architecture, but the main reason is that Alfresco needs some alterations in order to run on the GlassFish server due to incompatibilities between the implementation of JavaServer Faces (JSF) in Alfresco and in the GlassFish JEE server. While there should be no problems in running GlassFishESB and Alfresco/Tomcat on the same box if care is taken to avoid port conflicts, a remote implementation of Alfresco is probably the simpler option.

Configuring and running wsmonitor

wsmonitor uses *port forwarding* to monitor HTTP traffic. For example, if an Alfresco Web service is running at `http://www.myserver.ac.uk:8080/alfresco/api/Service/` and wsmonitor is listening on port 5050, then the WSDL Web service endpoint should be set to `http://localhost:5050/alfresco/api/Service/`. After sniffing an HTTP request, wsmonitor then forwards it to the true Alfresco endpoint.

The AMSeT blog provides an example of a wsmonitor configuration file [http://www.socketelf.org:8080/roller/amset/entry/wsmonitor].

Run a workflow

Open a BPEL project in the NetBeans IDE.

Change the Web service endpoint definitions to point to your Alfresco installation in the WSDL for every Alfresco Web service that is used AND in the wsmonitor configuration file.

There is a Flash video on the AMSeT wiki [http://amset.leeds.ac.uk:8080/amsetwiki/Wiki.jsp?page=Documentation] demonstrating how to create a composite application from a BPEL project and how to deploy and run this in GlassFishESB.

The AMSeT Workflow Toolkit

What is the toolkit?

The toolkit is a NetBeans BPEL module project that facilitates the process of creating Alfresco BPEL workflows. Its contents are as follows.

- The Alfresco Web service WSDls.

- Import schemas for the WSDLs.

- Web Service Security (WSS) schemas.

- ESB *normalised message* property definition WSDLs for each of the Afresco WSDLs.

  These enable the ESB to create SOAP security header elements for each operation request without the need to butcher the Web service WSDLs.

- Schemas for the datatypes associated with each Afresco Web service.

  These are useful for creating WSDLs for Web services that initialize the workflows.

- Utility DateTime WSDL.

  Used for setting Time-To-Live on security tokens. Can also be used for setting time intervals in workflows.

- Utility file download WSDL.

  Downloads files from the internet and converts to BinaryBase64 byte array which can then be published to Alfresco using the `ContentService`.

The Web Services

The Alfresco Web services are listed below together with a brief description of their purviews. More details about the services [http://amset.leeds.ac.uk:8080/amsetwiki/Wiki.jsp?page=Alfresco%20Web %20services] can be found on the AMSeT wiki.

- Access Control Service

  Querying and setting permissions.

- Action Service

  Operations relating to the Alfresco *actions* which are triggered when a set of preconditions are satisfied.

- Administration Service

  User provisioning.

- Authentication Service

  Provides a security ticket on receiving a username and password for an Alfresco administrator account.

- Authoring Service

  Version control.

- Classification Service

  Categorization of nodes through sets of aspects.

- Content Service

  Reading and writing content.

- Dictionary Service

  Operations regarding content models.

- Repository Service

  Operations on repository nodes.

How to use the toolkit

The toolkit can be downloaded from the AMSeT SourceForge site. It should be opened as a project in GlassFishESB NetBeans, 6.5.1. (Note that the latest NetBeans version, 6.7.1, does not offer full support for GlassFishESB 2.1 and ought not to be used for these projects.)

Run wsmonitor according to the instructions given above.

A screencast is available on the AMSeT wiki that demonstrates the use of the toolkit.

Licensing

All AMSeT code is released under the Apache 2 license. Copyright belongs to the University of Leeds.

About this document

This document was created using the Oxygen XML Editor 10.3 using its DocBook 5.0 schema and bundled HTML and PDF XSLT transformations.

Brian P. Clark, November 2009

Please see project wiki [http://amset.leeds.ac.uk:8080/amsetwiki/] for contact details.