

Apache jUDDI Guide

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Apache jUDDI Guide

by Kurt T Stam and Alex O'Ree

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Dedication

We'd like to dedicate this guide to Steve Viens and Andy Cutright who started this project back in 2003.

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Preface

The jUDDI project maintains a UDDIv3 registry that can be deployed to most modern JEE application servers. The jUDDI project is part of the Apache Software Foundation and encourages participation. It is easy to participate and if you discover a simple typo or would like to contribute to this guide in general please read the README page ([add link](#)).

Chapter 1. Universal Description, Discovery and Integration (UDDI)

1.1. UDDI Protocol, Specification

The Universal Description, Discovery and Integration (UDDI) protocol is one of the major building blocks required for successful Web services. UDDI creates a standard interoperable platform that enables companies and applications to quickly, easily, and dynamically find and use Web services over the Internet (or Intranet). UDDI also allows operational registries to be maintained for different purposes in different contexts. UDDI is a cross-industry effort driven by major platform and software providers, as well as marketplace operators and e-business leaders within the OASIS standards consortium [uddi-oasis-open-org]. UDDI has gone through 3 revisions and the latest version is 3.0.2 [uddi-v3]. Additional information regarding UDDI can be found at <http://uddi.xml.org> [uddi-xml-org].

1.2. UDDI Registry

The UDDI Registry implements the UDDI specification . UDDI is a Web-based *distributed directory* that enables businesses to list themselves on the Internet (or Intranet) and discover each other, similar to a traditional phone book's yellow and white pages. The UDDI registry is both a white pages business directory and a technical specifications library. The Registry is designed to store information about Businesses and Services and it holds references to detailed documentation.

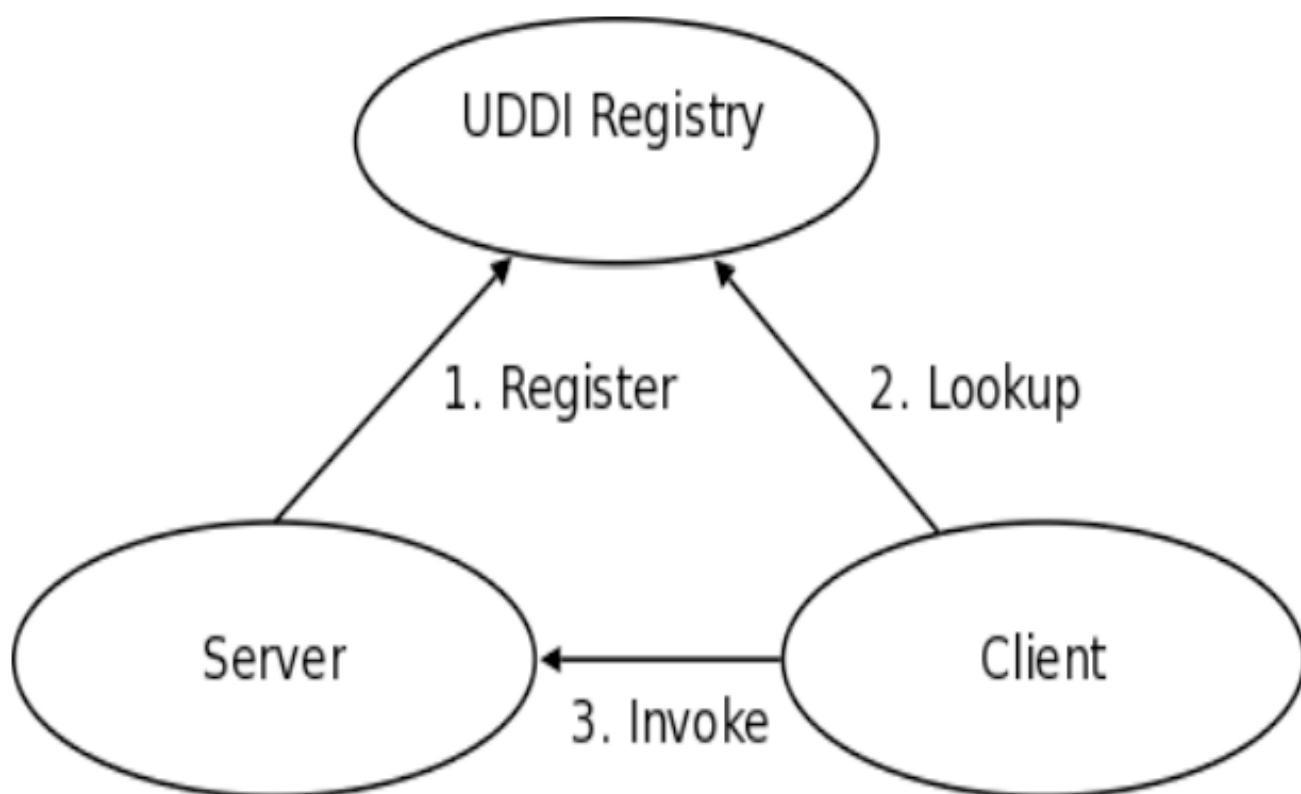


Figure 1.1. Invocation Pattern using the UDDI Registry

In step 1 of Figure 1.1, “Invocation Pattern using the UDDI Registry” it is shown how a business publishes services to the UDDI registry. In step 2, a client looks up the service in the registry and receives service binding information. Finally in step 3, the client then uses the binding information to invoke the service. The UDDI APIs are SOAP based for interoperability reasons. In this example we’ve three APIs specified in the UDDI v3 specification, Security, Publication and Inquiry. The UDDI v3 specification defines 9 APIs:

1. UDDI_Security_PortType, defines the API to obtain a security token. With a valid security token a publisher can publish to the registry. A security token can be used for the entire session.
2. UDDI_Publication_PortType, defines the API to publish business and service information to the UDDI registry.
3. UDDI_Inquiry_PortType, defines the API to query the UDDI registry. Typically this API does not require a security token.
4. UDDI_CustodyTransfer_PortType, this API can be used to transfer the custody of a business from one UDDI node to another.
5. UDDI_Subscription_PortType, defines the API to register for updates on a particular business of service.

6. UDDI_SubscriptionListener_PortType, defines the API a client must implement to receive subscription notifications from a UDDI node.
7. UDDI_Replication_PortType, defines the API to replicate registry data between UDDI nodes.
8. UDDI_ValueSetValidation_PortType, by nodes to allow external providers of value set validation. Web services to assess whether keyedReferences or keyedReferenceGroups are valid.
9. UDDI_ValueSetCaching_PortType, UDDI nodes may perform validation of publisher references themselves using the cached values obtained from such a Web service.

1.3. jUDDI Project

Apache jUDDI is server and client-side implementation of the UDDI v3 specification. The server side is the UDDI Registry, the client side are the juddi-client libraries. There is a Java as well as a C# version of the client libraries. The jUDDI GUI uses the client libraries to connect to a UDDI Registry. For more details please see the Chapter 2, *Getting Started*.

The following is a list of all supported UDDI interfaces provided by this release of jUDDI

Table 1.1. Supported UDDI Interfaces

API	Spec	Supported	Notes
Inquiry [http://uddi.org/pubs/uddi-v3.0.2-20041019.htm#_Toc85908076]	Required	All Methods	
Inquiry HTTP GET [http://uddi.org/pubs/uddi-v3.0.2-20041019.htm#_Toc85908158]	Optional	All Methods	Plus a number of additional methods
Publication [http://uddi.org/pubs/uddi-v3.0.2-20041019.htm#_Toc85908095]	Required	All Methods	
Security [http://uddi.org/pubs/uddi-v3.0.2-20041019.htm#_Toc85908115]	Optional	All Methods	Pluggable authentication
Subscription [http://uddi.org/pubs/uddi-v3.0.2-20041019.htm#_Toc85908128]	Optional	All Methods	HTTP, SMTP delivery implemented, pluggable
Subscription Listener [http://uddi.org/pubs/uddi-v3.0.2-20041019.htm#_Toc85908336]	Optional	All Methods	Client and Server side implementations

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API	Spec	Supported	Notes
Value Set Caching [http://uddi.org/pubs/uddi-v3.0.2-20041019.htm#_Toc85908141]	Optional	Partial	Scheduled for 3.3
Value Set Validation [http://uddi.org/pubs/uddi-v3.0.2-20041019.htm#_Toc85908141]	Optional	Implemented	Scheduled for 3.3
Replication [http://uddi.org/pubs/uddi-v3.0.2-20041019.htm#_Toc85908180]	Optional	Partial	Scheduled for 3.3
Custody and Ownership Transfer [http://uddi.org/pubs/uddi-v3.0.2-20041019.htm#_Toc85908118]	Optional	All Methods	Only supports user to user transfers on the same node
UDDIv2 Inquiry [http://uddi.org/pubs/ProgrammersAPI-V2.04-Published-20020719.htm#_Toc25137711]	Required	BETA	Supported via API translator
UDDIv2 Publish [http://uddi.org/pubs/ProgrammersAPI-V2.04-Published-20020719.htm#_Toc25137722]	Required	BETA	Supported via API translator

The following is a list of other features of interest that was either defined in the UDDI specifications or in technical notes.

Table 1.2. jUDDI Features

API	Spec	Supported	Notes
Digital Signatures	Server req	Full support	Java and .NET clients and in browser signing
Client side Subscription Listener	Optional	Full support	Java and .NET clients
WSDL to UDDI [https://www.oasis-open.org/committees/uddi-spec/doc/tn/]	Recommendation	Full support	Java, .NET clients and web GUI

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API	Spec	Supported	Notes
uddi-spec-tc-tn-wsdl-v2.htm]			
WADL to UDDI [https://www.oasis-open.org/committees/uddi-spec/doc/tn/uddi-spec-tc-tn-wsdl-v2.htm]	Recommendation	Full support	Java, .NET clients and web GUI
BPEL to UDDI [https://www.oasis-open.org/committees/uddi-spec/doc/tn/uddi-spec-tc-tn-bpel-20040725.htm]	Recommendation	Full support	Java client
UDDI Technical Compliance Kit	-	Full support	Provides a standalone UDDI testing capability
Internationalization	Recommendation	Yes	Both end user interfaces (User and Admin web apps) are supported. Error messages from the server are external and can be overwritten.
Registration via Annotations	-	Full support	Provides automated registration of classes via Java/.NET Annotations

UDDI defines a number of sorting mechanisms [http://uddi.org/pubs/uddi-v3.0.2-20041019.htm#_Toc85908080].

Table 1.3. Supported Sort Orders

Find Qualifier	Spec	Supported	Notes
binarySort [http://uddi.org/pubs/uddi-v3.0.2-20041019.htm#sortOrd]	Required	yes	
caseInsensitiveSort [http://uddi.org/	Required	party	Only when using caseInsensitiveMatch, JIRA opened [https://

Find Qualifier	Spec	Supported	Notes
pubs/uddi-v3.0.2-20041019.htm#caseInsensSort]			issues.apache.org/jira/browse/JUDDI-785]
caseSensitiveSort [http://uddi.org/pubs/uddi-v3.0.2-20041019.htm#_Toc85908355]	Required	yes	
sortByNameAsc [http://uddi.org/pubs/uddi-v3.0.2-20041019.htm#_Toc85908356]	Required	yes	
sortByNameDesc [http://uddi.org/pubs/uddi-v3.0.2-20041019.htm#_Toc85908357]	Required	yes	
sortByDateAsc [http://uddi.org/pubs/uddi-v3.0.2-20041019.htm#_Toc85908358]	Required	yes	
sortByDateDesc [http://uddi.org/pubs/uddi-v3.0.2-20041019.htm#_Toc85908359]	Required	yes	
JIS-X4061 [http://uddi.org/pubs/uddi-v3.0.2-20041019.htm#_Toc42047570]	Optional	no	Japanese Character Strings

UDDI also defines a number of Find Qualifiers [http://uddi.org/pubs/uddi-v3.0.2-20041019.htm#_Toc85908080], which modify the default search behavior of the Inquiry [http://uddi.org/pubs/uddi-v3.0.2-20041019.htm#_Toc85908076] Find* APIs.

Table 1.4. Supported Find Qualifiers

Find Qualifier	Spec	Supported
andAllKeys [http://uddi.org/pubs/uddi-v3.0.2-20041019.htm#_Toc85908360]	Required	yes
approximateMatch [http://uddi.org/pubs/uddi-v3.0.2-20041019.htm#_Toc85908346]	Required	yes

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Find Qualifier	Spec	Supported
bindingSubset [http://uddi.org/pubs/uddi-v3.0.2-20041019.htm#_Toc85908365]	Required	yes
caseInsensitiveMatch [http://uddi.org/pubs/uddi-v3.0.2-20041019.htm#_Toc85908348]	Required	yes
caseSensitiveMatch [http://uddi.org/pubs/uddi-v3.0.2-20041019.htm#_Toc85908349]	Required	yes
combineCategoryBags [http://uddi.org/pubs/uddi-v3.0.2-20041019.htm#_Toc85908363]	Required	yes
diacriticInsensitiveMatch [http://uddi.org/pubs/uddi-v3.0.2-20041019.htm#_Toc85908350]	Optional	yes
diacriticSensitiveMatch [http://uddi.org/pubs/uddi-v3.0.2-20041019.htm#_Toc85908351]	Required	yes
exactMatch [http://uddi.org/pubs/uddi-v3.0.2-20041019.htm#_Toc85908347]	Required	yes
signaturePresent [http://uddi.org/pubs/uddi-v3.0.2-20041019.htm#_Toc85908367]	Required	yes
orAllKeys [http://uddi.org/pubs/uddi-v3.0.2-20041019.htm#_Toc85908361]	Required	yes
orLikeKeys [http://uddi.org/pubs/uddi-v3.0.2-20041019.htm#_Toc85908362]	Required	yes
serviceSubset [http://uddi.org/pubs/uddi-v3.0.2-20041019.htm#_Toc85908364]	Required	yes
suppressProjectedServices [http://uddi.org/pubs/uddi-v3.0.2-20041019.htm#_Toc85908366]	Required	yes

Chapter 2. Getting Started

The jUDDI project is an open source implementation of the UDDI specification. The registry implementation is a WebArchive (war) *juddiv3.war* which is deployable to any JEE container. The application exposes a WebService API which can be accessed using any generic SOAP client, the *juddi-gui* or, if you are looking to integrate the UDDI api in your application, the Java or .NET version of the *juddi-client*.

2.1. Prerequisites

jUDDI is written in Java and minimally requires

- JDK1.6+, although jUDDI should run on JDK1.6, please use the latest JDK if possible

optionally

- Maven 3.0.3+ if you want to run the examples
- A Relation Database, to replace Derby

The versions mentioned above are minimal versions and it is recommended to use the latest version available. By default jUDDI ships and uses a *Derby* database. After evaluation you probably want to move to a more full featured database.

2.2. What should I Download?

At the jUDDI download page <http://juddi.apache.org/releases.html>, you have the choice of two distributions; the *juddi-client* distro or the *juddi-distro*, where the latter includes both client and server. Each distribution contains signed binaries, source, examples and documentation. If you are not sure which distribution to download, then take the *juddi-distro* since it contains everything which is by far the easiest way to get going.

2.3. Running jUDDI

After downloading and unpacking of the *juddi-distro*, you can start the preconfigured tomcat server by going into the *juddi-distro-<version>* directory and running startup

```
$ cd apache-tomcat-<version>/bin
$ ./startup.sh
```

Once the server is up and running can make sure the root data was properly installed by browsing to <http://localhost:8080/juddiv3>

You should see the screen show in Figure 2.1, “jUDDI welcome page”, the jUDDI Welcome Page.

Apache jUDDI version 3.2.0.SNAPSHOT

Welcome to Apache jUDDI!

jUDDI is an open source implementation of [OASIS's Universal Discovery Description and Integration \(UDDI\)](#). You've reached the deployment page for jUDDI's web services.
Looking for the old jUDDI Portal/Portlets? We've completely rewritten it.

[View the jUDDI User Interface](#) - This is a nearly complete UDDIv3 end user web application.

[View the jUDDI Administration Interface](#) - This is for administrators to use to reconfigure jUDDI, check the status, and perform administrative actions.

Here's some useful links to learn more about the UDDI and jUDDI.

- [View the service listing on this UDDI node](#)
- [Visit the Apache-jUDDI Home Page](#)
- [jUDDI Users Guide](#)
- [jUDDI Developers Guide](#)
- [jUDDI API Documentation](#)
- [jUDDI Wiki](#)
- [jUDDI's Issue Tracker \(report a bug\)](#)
- [jUDDI's Source Code](#)
- [jUDDI's Mailing Lists](#)

jUDDI Installation Status

jUDDI has been successfully installed!

Node Information

Root Partition:	uddi:juddi.apache.org
Node Id:	uddi:juddi.apache.org:node1
Root Business Key:	uddi:juddi.apache.org:businesses-asf
Root Business Name:	An Apache jUDDI Node
Root Business Description:	This is a UDDI v3 registry node as implemented by Apache jUDDI.

Figure 2.1. jUDDI welcome page

Before continuing please check the jUDDI installation Status on this page and make sure it says: "jUDDI has been successfully installed!". If the page won't load or the status is anything else please check the *apache-tomcat-x.x.x/logs/juddi.log* and if you need help you can contact us via the jUDDI user mailing list. Also note that it created a *root* partition, using seed data. You can modify or add to the seed, for that see Chapter 6, *UDDI Seed Data*.

2.4. Using the jUDDI Administrative Interface

The juddi admin console runs at <http://localhost:8080/juddiv3/admin> and requires a login with the role of *uddiadmin* via the basic authentication popup dialog box. Check the *apache-tomcat-x.x.x/conf/tomcat-users.conf* file for the password of the *uddiadmin* user. Please change the password before going live.

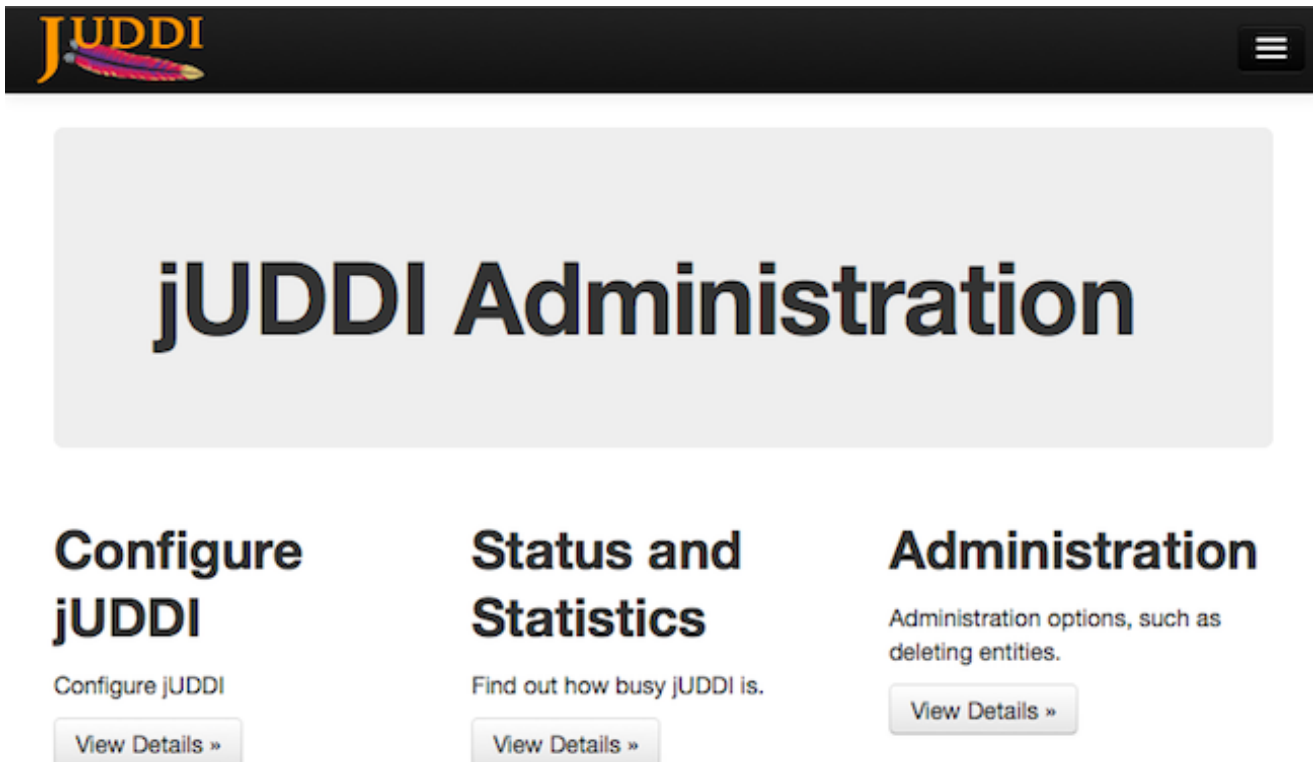
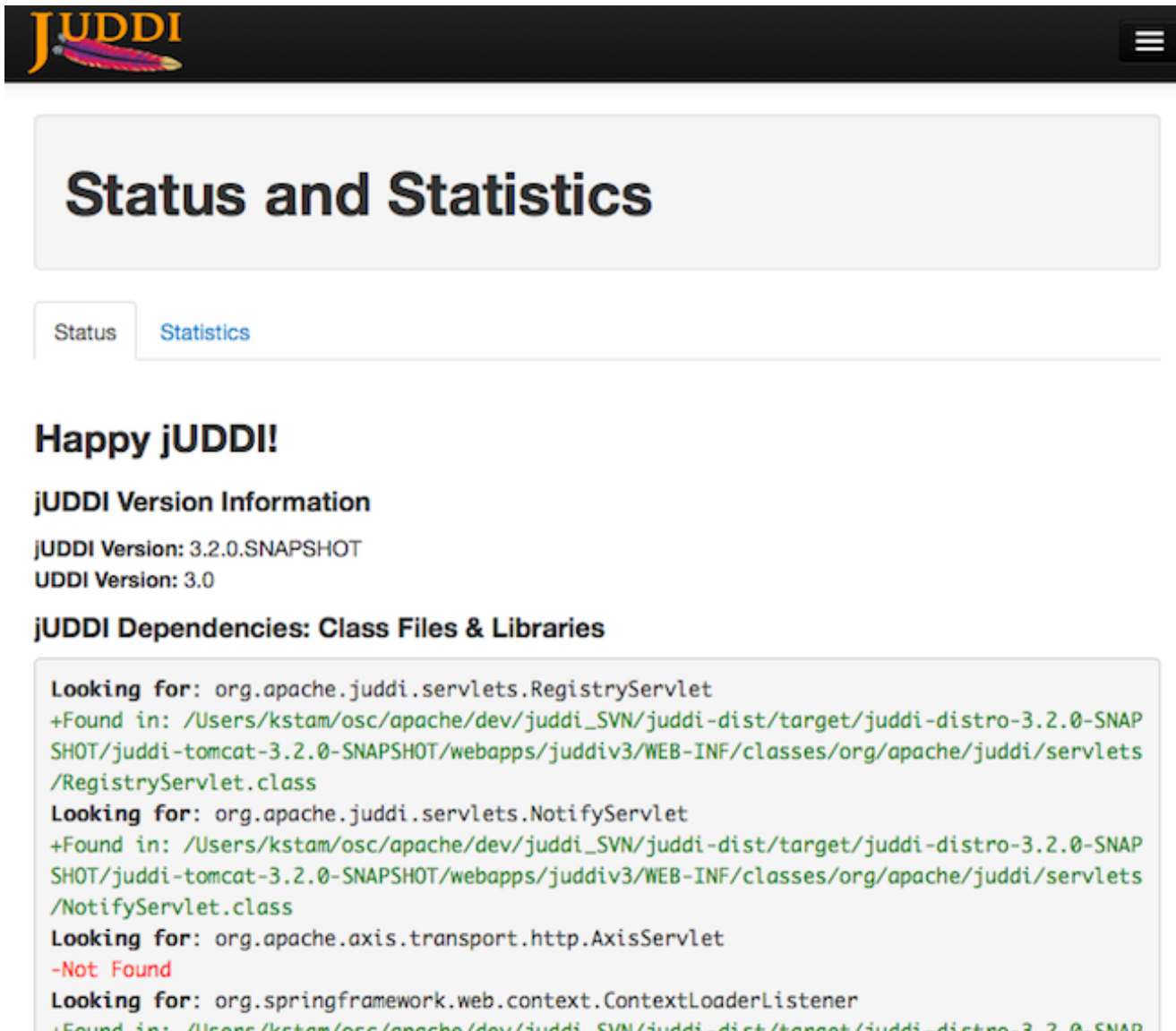


Figure 2.2. jUDDI admin

By popular demand we brought back the happy jUDDI!' page. Just click on *Status and Statistics* page. By default we run on CXF, so it is normal if says the AxisServlet is not found. There should be no other red on this page.



Status and Statistics

Status Statistics

Happy jUDDI!

jUDDI Version Information

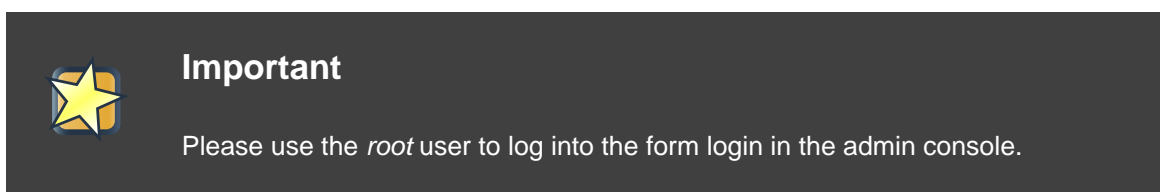
jUDDI Version: 3.2.0.SNAPSHOT
UDDI Version: 3.0

jUDDI Dependencies: Class Files & Libraries

```
Looking for: org.apache.juddi.servlets.RegistryServlet
+Found in: /Users/kstam/osc/apache/dev/juddi_SVN/juddi-dist/target/juddi-distro-3.2.0-SNAPSHOT/juddi-tomcat-3.2.0-SNAPSHOT/webapps/juddiv3/WEB-INF/classes/org/apache/juddi/servlets/RegistryServlet.class
Looking for: org.apache.juddi.servlets.NotifyServlet
+Found in: /Users/kstam/osc/apache/dev/juddi_SVN/juddi-dist/target/juddi-distro-3.2.0-SNAPSHOT/juddi-tomcat-3.2.0-SNAPSHOT/webapps/juddiv3/WEB-INF/classes/org/apache/juddi/servlets/NotifyServlet.class
Looking for: org.apache.axis.transport.http.AxisServlet
-Not Found
Looking for: org.springframework.web.context.ContextLoaderListener
+Found in: /Users/kstam/osc/apache/dev/juddi_SVN/juddi-dist/target/juddi-distro-3.2.0-SNAPSHOT/juddi-tomcat-3.2.0-SNAPSHOT/webapps/juddiv3/WEB-INF/classes/org/springframework/web/context/ContextLoaderListener.class
```

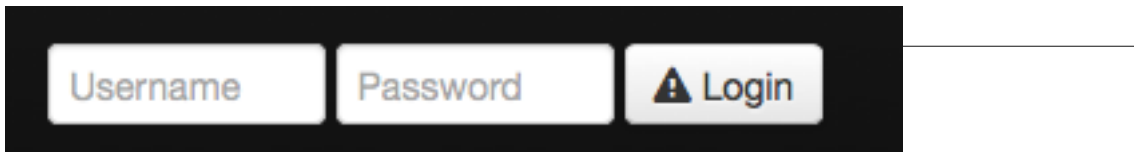
Figure 2.3. Happy jUDDI.

By default jUDDI ships with 2 publishers: *root* and *uddi*. Root is the owner of the repository, while the *uddi* user is the owner of all the default tmodels and categorizations. Please use the *root* user to log into the form login in the admin console.



Important

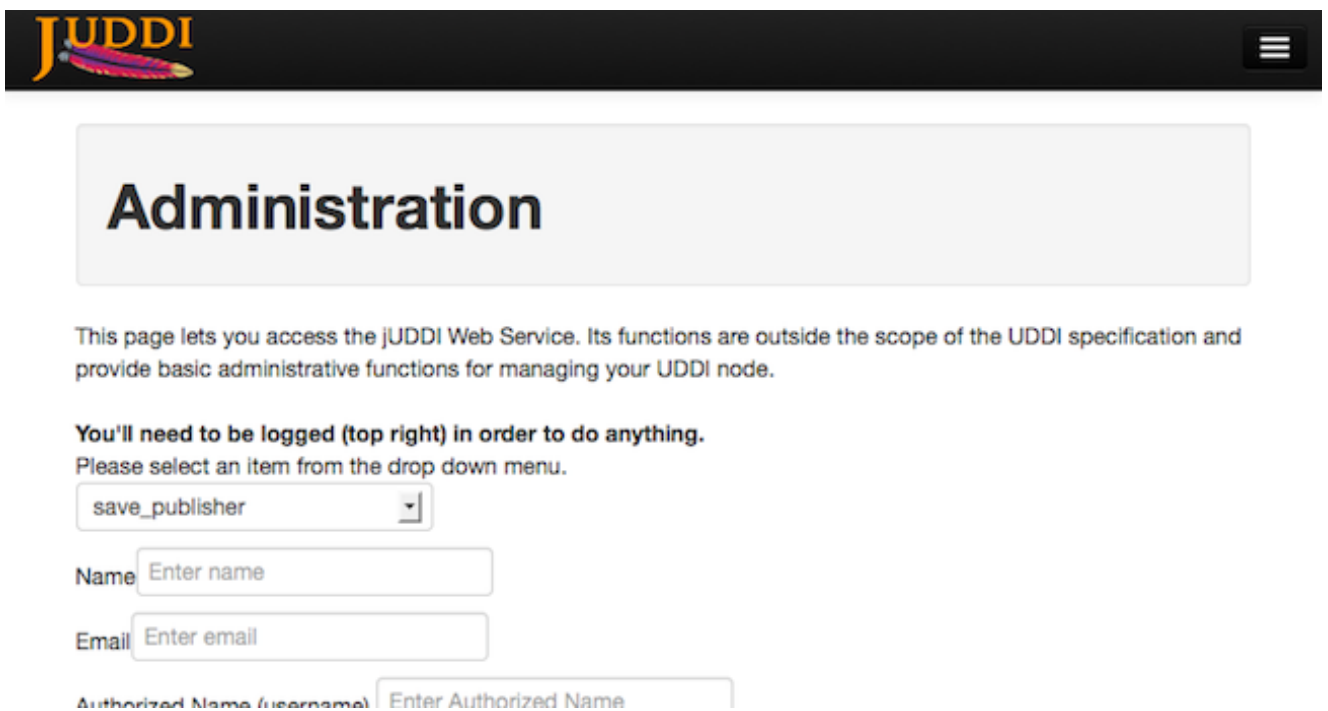
Please use the *root* user to log into the form login in the admin console.



A horizontal login form with a black background. It contains three white rounded rectangular buttons: 'Username', 'Password', and 'Login'. The 'Login' button features a small warning triangle icon to its left.

Figure 2.4. Form login

You will now be able to do more than simple browsing. Navigate to the Administration and select *save_publisher* from the dropdown. This will allow you to add your own publisher.



The screenshot shows the 'Administration' page of the jUDDI web service. At the top left is the jUDDI logo, and at the top right is a hamburger menu icon. The main heading is 'Administration'. Below it, a paragraph explains that the page provides basic administrative functions for managing the UDDI node. A warning message states: 'You'll need to be logged (top right) in order to do anything. Please select an item from the drop down menu.' Below this is a dropdown menu with 'save_publisher' selected. There are three input fields: 'Name' with the placeholder 'Enter name', 'Email' with the placeholder 'Enter email', and 'Authorized Name (username)' with the placeholder 'Enter Authorized Name'.

Figure 2.5. Add Publisher

2.5. Using jUDDI Web Services

OK now that we have verified that jUDDI is good to go we can inspect the UDDI WebService API by browsing to <http://localhost:8080/juddiv3/services>

You should see an overview of all the SOAP Services and their WSDLs.

Using
jUDDI
Web

Available SOAP services:

<p>JUDDI_Api_PortType</p> <ul style="list-style-type: none"> • get_publisherDetail • delete_ClientSubscriptionInfo • save_Clerk • get_allPublisherDetail • delete_publisher • adminDelete_tModel • save_publisher • save_Node • save_ClientSubscriptionInfo • invoke_SyncSubscription 	<p>Endpoint address: http://localhost:8080/juddiv3/services/juddi-api WSDL : {urn:juddi-apache-org:v3_service}JUDDIApiService Target namespace: urn:juddi-apache-org:v3_service</p>
<p>UDDI_CustodyTransfer_PortType</p> <ul style="list-style-type: none"> • discard_transferToken • transfer_entities • get_transferToken 	<p>Endpoint address: http://localhost:8080/juddiv3/services/custody-transfer WSDL : {urn:uddi-org:v3_service}UDDICustodyTransferService Target namespace: urn:uddi-org:v3_service</p>
<p>UDDI_Inquiry_PortType</p> <ul style="list-style-type: none"> • get_tModelDetail • get_bindingDetail • find_service • get_serviceDetail • find_bindings 	<p>Endpoint address: http://localhost:8080/juddiv3/services/inquiry WSDL : {urn:uddi-org:v3_service}UDDIInquiryService</p>

Figure 2.6. jUDDI Services

The services page shows you the available endpoints and methods available. Using any SOAP client, you should be able to import the wsdl's into a tool like SoapUI as shown in Figure 2.7, "Getting an authToken using SoapUI" and send some sample requests to jUDDI to test:

Using
jUDDI
GUI

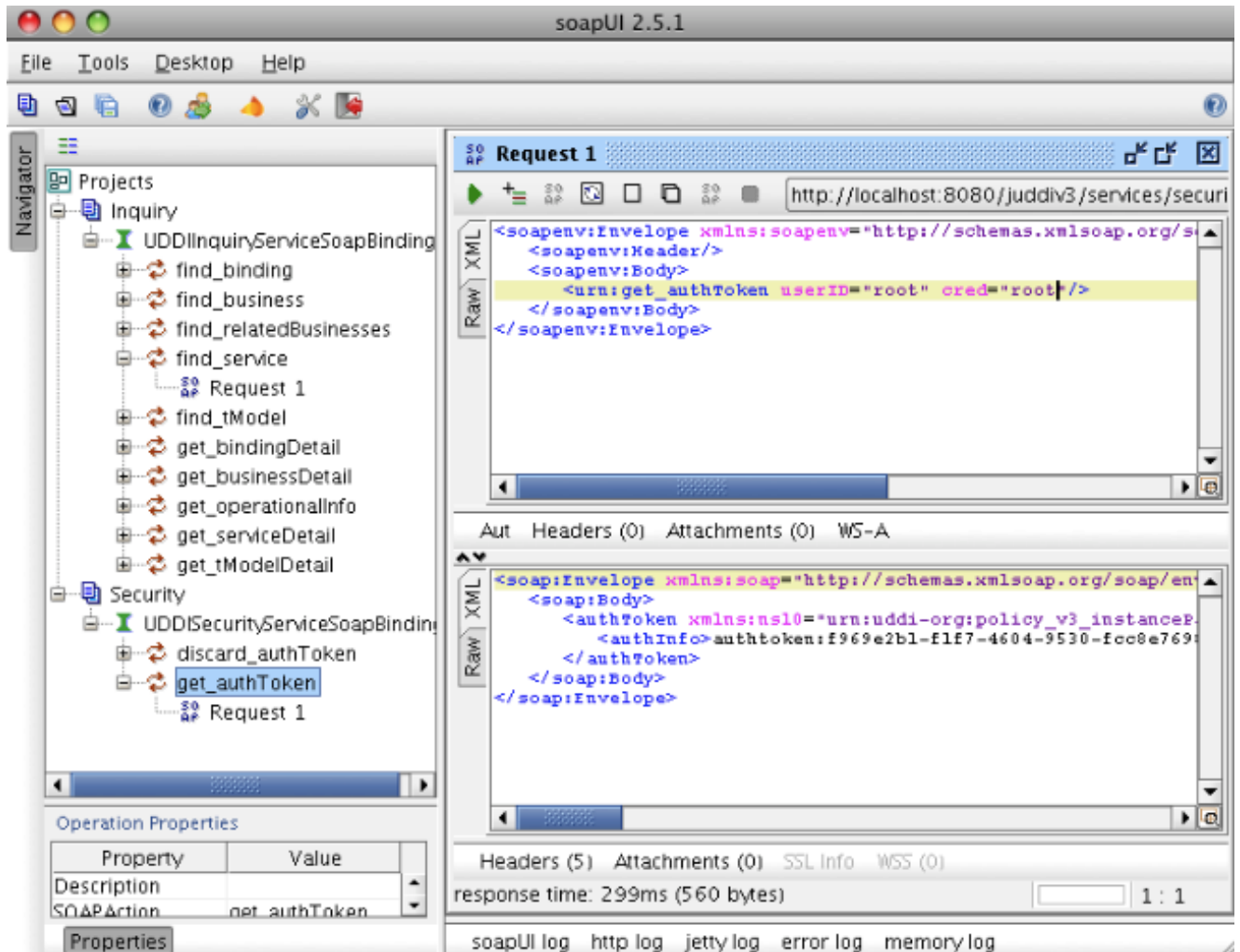


Figure 2.7. Getting an authToken using SoapUI



Tip

Try obtaining an authToken for the publisher you created earlier.

2.6. Using jUDDI GUI to create your keygenerator and business

Navigate to <http://localhost:8080/juddi-gui/> to get to the jUDDI-GUI. Please use the Form Login and use the credentials of the publisher you created above. You can browse around, but really the first thing that needs to be done is to create a Key Generator or Partition at <http://localhost:8080/juddi-gui/tmodelPartitions.jsp>. A Key Generator is needed to save human readable, universally unique UDDIv3 keys. Please read more about UDDI v3 formatted keys, but the short story is that UDDI v3 keys are formatted like: *uddi:<domain>:name*. For example, if you wanted a tModel defined

Using
jUDDI
GUI

as "uddi:www.mycompany.com:serviceauthenticationmethod", you would first have to create a tModel key generator with value "uddi:www.mycompany.com:keygenerator".

create
your

JUDDI Home Discover Create Settings Help Welcome kurt

tModel Key Generators (Partitions)

TModel Key Generators are a special kind of tModel that enables you to define new tModels with any arbitrary tModel prefix that you want. For example, if you wanted a tModel defined as "uddi:www.mycompany.com:ServiceAuthenticationMethod", you would first have to create a tModel key generator with the value of "uddi:www.mycompany.com:keyGenerator". This is part of the UDDI specification and acts as a governance mechanism. You can also create a tModel Key Generator by using the Create tModel menu option and by adding the appropriate settings.

i For jUDDI implementations of UDDI, the "root" account cannot be used to create a keyGenerator.

The UDDI tModel key

A name describing the key

Language

Save

Figure 2.8. Create Key Generator

Next create your business using the key generator format you just registered. For example in Figure 2.9, "Create Business" we use a businessKey of *uddi:www.mycompany.com:mybusiness*.

Running the demos

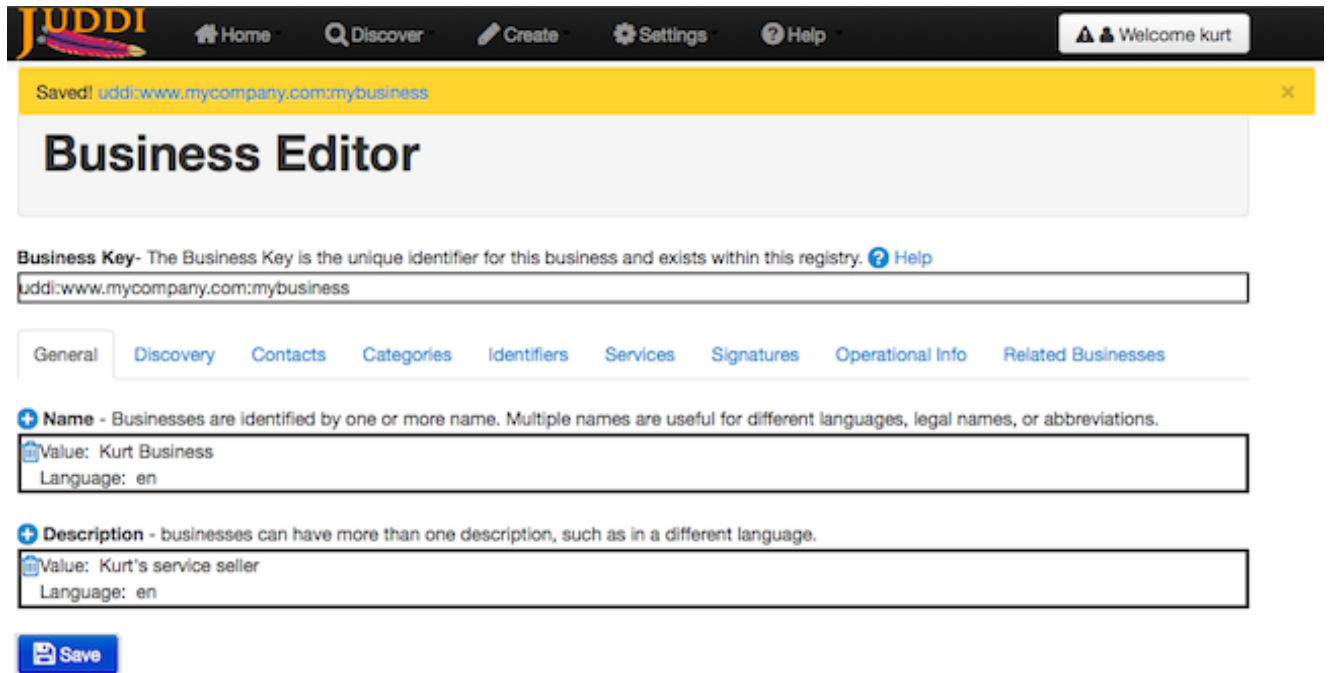


Figure 2.9. Create Business

See the Client and GUI Guide [stam-oree] for more details on how to use the GUI.

2.7. Running the demos in the disto

The jUDDI distribution ships with a lot of demos to get yourself more familiarized with the features of jUDDI. You are encouraged to go over the demos and follow the instructions in the README files. To ensure the demos work they use the root publisher. In practice you should not be using the root publisher for this, but rather your own publisher you created above. To reference your own publisher simply update the uddi.xml file in each demo. For more details on running the demos see the Client and GUI Guide [stam-oree].

2.8. Examples on the jUDDI blog

The jUDDI blog at <http://apachejuddi.blogspot.com/> has examples as well as screencasts. This can be a useful resource to learn about some new feature or to simply get started.

2.9. What is new in jUDDI 3.2?

Here's the change log for version 3.2

- A new end user interface based on Twitter's Bootstrap
- A new administrative user interface based on Twitter's Bootstrap with in browser monitoring

What
is
new
in
jUDDI
3.2?

- A client side subscription callback API
- Client distribution package
- Many more examples
- WADL to UDDI mappings
- All credentials are now encryptable with command line tools
- Removal of the porlet services
- Deployment templates for Jboss EAP 6+
- Client side digital signature support
- REST style interface for Inquiry API
- Added many more tModels to the base install
- More documentation

Chapter 3. jUDDI Architecture

3.1. jUDDI Server

The jUDDI Architecture leverages well known frameworks to minimize the codebase we need to maintain. The API layer uses JAX-WS, while the persistence layer uses JPA. The entire server is packaged as a war archive that can be deployed to different servlet containers with minimal configuration changes. The JPA layer uses JDBC to communicate to a relational database. Figure 3.1, “jUDDI Architecture” shows the different components, where the implementation providers marked with a blue dot are the implementations we use by default.

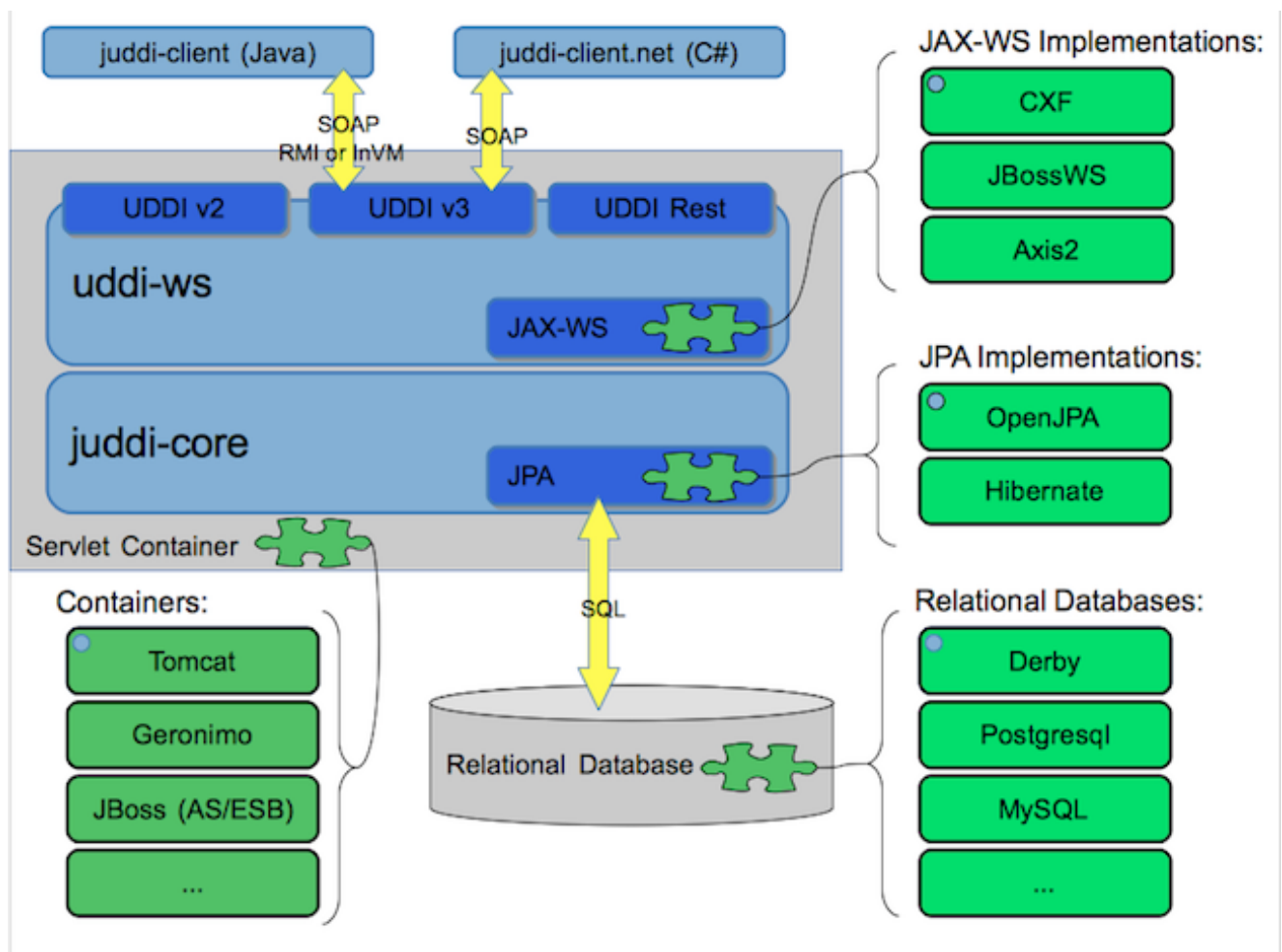


Figure 3.1. jUDDI Architecture

3.1.1. UDDI API layer `uddi-ws` using JAX-WS

The API layer is generated from the WSDL files provided with the UDDI specification. Since the 3.2 release we support both the UDDIv2 as well as the UDDIv3 API. The `uddi-ws` components

Core UDDI

juddi-

leverages `JAX-WS` annotations to bring up the UDDI v2 and v3 Endpoints. In addition to these two sets of SOAP based services, we also support a REST based API. The REST based API is a subset of the SOAP API. The default JAX-WS implementation used is Apache CXF, but we also offer scripted deployments for JBossWS and Axis2. Each WebService stack relies on the `web.xml` as well as vendor specific configuration files. For example, CXF uses a `beans.xml` file in the `WEB-INF` directory. For more details on this see ???.

The `juddi-client.jar` can be used on the client side to communicate with the API layer. The `juddi-client` can be configured to use either SOAP, RMI or and inVM protocol, where the inVM protocol is the most performant. For more details on the `juddi-client` configuration options see the Client Guide [stam-oree].

3.1.2. Core UDDI `juddi-core` using JPA

The jUDDI server logic is packaged in the `juddi-core.jar`. It implements all of the server side behavior defined in the UDDI specification. For persistence it uses the Java Persistence Api (JPA). The default JPA implementation used is OpenJPA, but Hibernate is supported as well. The configuration for JPA implementations lives in the `WEB-INF/classes/META-INF/persistence.xml` file. This file also references the `datasource` that is used to connect to the `datasource`.



Important

It is important to note that there are two JARs provided through maven. If you will be using Hibernate, please use the `juddi-core` JAR, if you are using OpenJPA, use `juddi-core-openjpa`.

The difference between these JARs is that the persistence classes within `juddi-core-openjpa` have been enhanced (http://people.apache.org/~mprudhom/openjpa/site/openjpa-project/manual/ref_guide_pc_enhance.html). Unfortunately, the Hibernate classloader does not deal well with these enhanced classes, so it is important to note not to use the `juddi-core-openjpa` JAR with Hibernate.

3.1.3. Relational Databases

By default we ship jUDDI preconfigured with a Java based Database called `Derby`. This database persists to the local file system, typically from where the application was started.



Note

To switch databases, you need to change the JDBC driver configuration in the `datasource` as well as the database dialect setting in the `persistence.xml`.

For details on switching database see the Section 4.3, "Configuration Database Connections".

3.1.4. Servlet Containers

The jUDDI server is packaged up a WebArchive (`juddiv3.war`). This war archive can be deployed to different servlet containers with minimal configuration changes. By default we ship on Apache Tomcat but we also have scripted deployment support for GlassFish and JBoss.



Tip

Most open source EE6 containers (JBoss, Geronimo, Glassfish) ship with jUDDI preconfigured to pass the JAXR tests in the TCK.

When switching containers you may need to use different configuration to create a datasource. Some containers already package up a WebServices stack which can be used instead of the CXF packages up in `juddiv3.war/WEB-INF/lib`. In that case the number of dependent jars in the `juddiv3.war` can be reduced significantly. For details on switching containers see the Chapter 7, *How to deploy jUDDI To?*.

3.2. jUDDI GUI `juddi-gui.war`

The jUDDI GUI is also a Web Archive that is deployed along side the `juddiv3` server in the same servlet container. The GUI uses the `juddi-client` to communicate to the UDDI API Endpoints. It can use a SOAP, RMI or an inVM transport protocol, so the GUI can be deployed in a different location then the server as long as it can connect to the UDDI SOAP API.

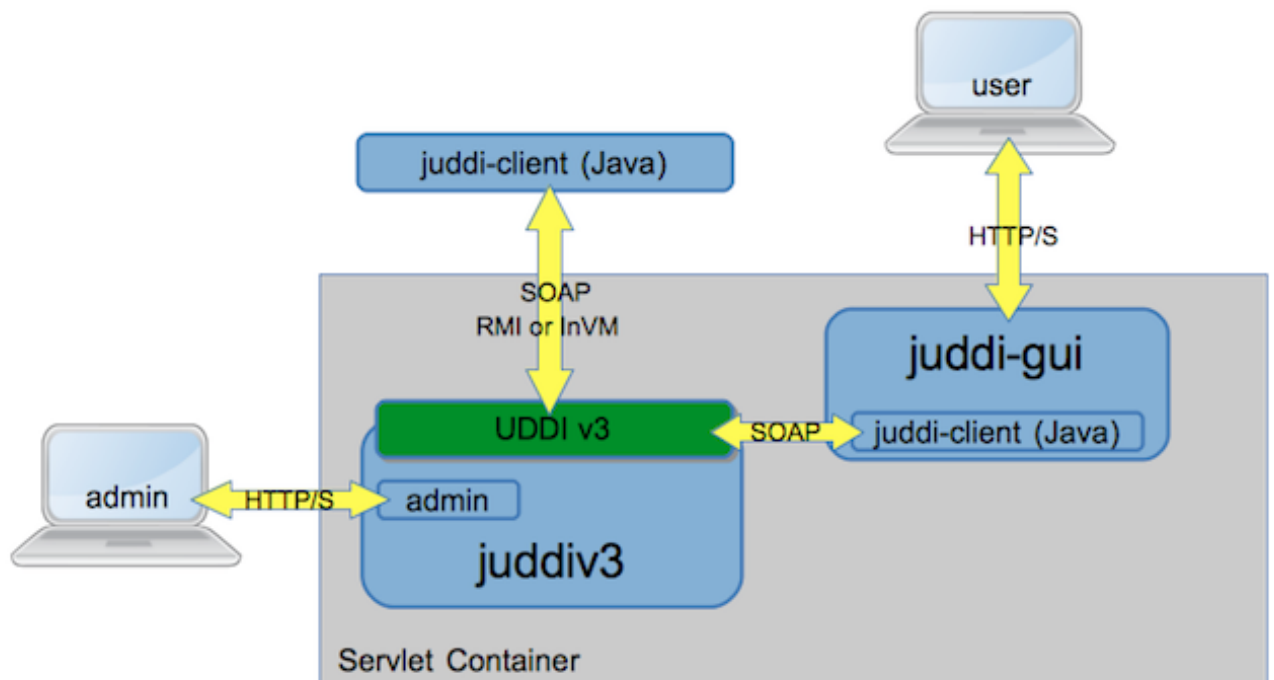


Figure 3.2. jUDDI Client and Console Architecture

jUDDI
GUI

juddi-
gui.war

Figure 3.2, “jUDDI Client and Console Architecture” shows the admin console and the juddi-gui. Typically one runs the admin console behind a firewall. The admin console interacts over a jUDDI WS API and, among other things, it can be used to create and delete publishers.

The `juddi-gui` can be configured to connect to any UDDIv2 or UDDIv3 compliant UDDI server.

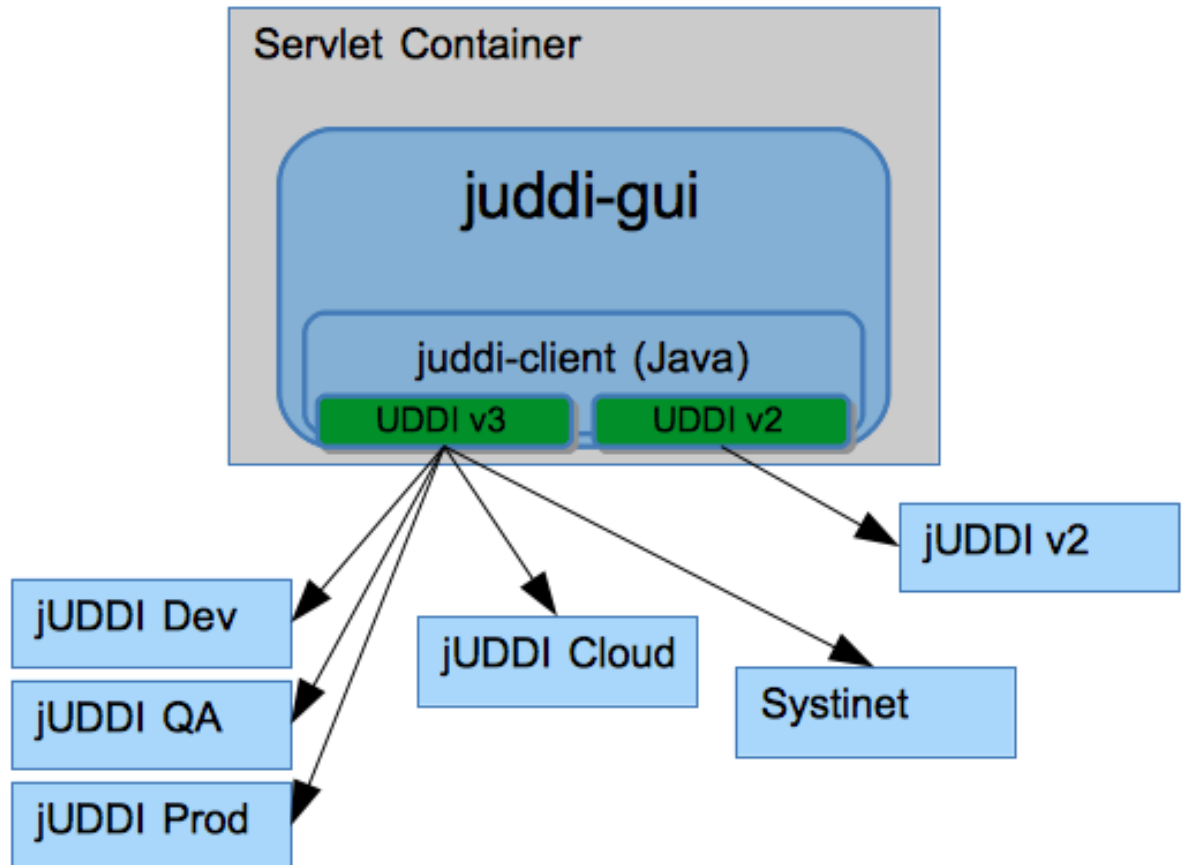


Figure 3.3. jUDDI Console Architecture

You may have a jUDDI v3 Server for each type of environment (Dev, QA and Prod) and you would only need one console to connect to each one of them.

For details on using the GUI see the Client and GUI Guide [stam-oree].

Chapter 4. Administration

4.1. Changing the Web Server Listen Port

If you want to change the port Tomcat listens on to something non-standard (something other than 8080), use the following guidance.

jUDDI Server (Tomcat) - This assumes you are using the jUDDI server bundled with Apache Tomcat. For other application servers, consult their documentation, however the `juddiv3.xml` must still be altered.

- Edit `conf/server.xml` and change the port within the `<Connector>` element.
- Edit `webapps/juddiv3/WEB-INF/classes/juddiv3.xml` and change the port number jUDDI Server Baseurl.
- Edit `webapps/juddiv3/WEB-INF/config.properties` and change the port numbers for "securityurl" and "juddipapi".
- Edit `webapps/juddi-gui/META-INF/config.properties` and change the port numbers for all of the URLs listed.

4.2. Administering Users and Access Control

As of version 3.2, jUDDI Authentication is handled from two perspectives, administrator and end user access.

4.2.1. Administrative Users

Administrative users have special access to juddi-gui's remote configuration page at `http://localhost:8080/juddi-gui/settings.jsp` and to the Administrative Console at `http://localhost:8080/juddiv3/admin`. Access to both of these is configured at the container level (i.e. Jboss, Tomcat, etc). By default, users that need to access these pages need to have the "uddiadmin" role (which is defined in the `WEB-INF/web.xml` of both web application archives). When you are running on tomcat this configuration can be found in the `<tomcat>/conf/tomcat-users.conf` file.

4.2.2. End Users

End users typically will either access jUDDI's services directly at `http://localhost:8080/juddiv3/` or via the user interfaces `http://localhost:8080/juddi-gui`. In both cases, authentication is handled via jUDDI's Authentication providers which is configured in `juddiv3.war/WEB-INF/classes/juddiv3.xml`.

4.2.2.1. Under the Hood

In order to enforce proper write access to jUDDI, each request to jUDDI needs a valid authToken. Note that read access is not restricted (by default, but can be enabled) and therefore queries into the registries are not restricted.

To obtain a valid authToken a `getAuthToken()` request must be made, where a `GetAuthToken` object is passed. On the `GetAuthToken` object a `userid` and `credential` (password) needs to be set.

```
org.uddi.api_v3.GetAuthToken ga = new org.uddi.api_v3.GetAuthToken();
ga.setUserID("username");
ga.setCred("password");
org.uddi.api_v3.AuthToken token = securityService.getAuthToken(ga);
```

The property `juddi/auth/*` in the `juddiv3.xml` configuration file can be used to configure how jUDDI is going to check the credentials passed in on the `GetAuthToken` request. By default jUDDI uses the `JUDDIAuthenticator` implementation. You can provide your own authentication implementation or use any of the ones mention below. The implementation needs to implement the `org.apache.juddi.auth.Authenticator` interface, and `juddi/auth/authenticator/class` property should refer to the implementation class.

There are two phases involved in Authentication. The authenticate phase and the identify phase. Both of these phases are represented by a method in the `Authenticator` interface.

The authenticate phase occurs during the `GetAuthToken` request as described above. The goal of this phase is to turn a user id and credentials into a valid publisher id. The publisher id (referred to as the "authorized name" in UDDI terminology) is the value that assigns ownership within UDDI. Whenever a new entity is created, it must be tagged with ownership by the authorized name of the publisher. The value of the publisher id can be completely transparent to jUDDI - the only requirement is that one exists to assign to new entities. Thus, the authenticate phase must return a non-null publisher id. Upon completion of the `GetAuthToken` request, an authentication token is issued to the caller.

In subsequent calls to the UDDI API that require authentication, the token issued from the `GetAuthToken` request must be provided. This leads to the next phase of jUDDI authentication - the identify phase.

The identify phase is responsible for turning the authentication token (or the publisher id associated with that authentication token) into a valid `UddiEntityPublisher` object. The `UddiEntityPublisher` object contains all the properties necessary to handle ownership of UDDI entities. Thus, the token (or publisher id) is used to "identify" the publisher.

The two phases provide compliance with the UDDI authentication structure and grant flexibility for users that wish to provide their own authentication mechanism. Handling of credentials and publisher properties can be done entirely outside of jUDDI. However, jUDDI provides the `Publisher` entity, which is a sub-class of `UddiEntityPublisher`, to persist publisher properties within jUDDI. This is used in the default authentication and is the subject of the next section.

4.2.2.2. Choosing a Cryptographic Provider

jUDDI provides a number of cryptographic providers. Some of them may not be available in your region of the world due to export restrictions. All of these providers are provided that are included with the Oracle Java Runtime Environment.

4.2.2.2.1. jUDDI's Cryptographic Providers



Tip

The AES256Cryptor requires the Sun Java unlimited strength Cryptographic Extensions to be installed. OpenJDK users are not affected by this.

In the following section, Authentication, a Cryptographic Provider must be selected using the following property in juddiv3.xml:

```
juddi/cryptor
```

4.2.2.2.2. jUDDI Server Providers

- org.apache.juddi.cryptor.DefaultCryptor - Password Based Encryption With MD5 and DES
- org.apache.juddi.cryptor.TripleDESCryptor - Triple DES 168 bit
- org.apache.juddi.cryptor.AES128Cryptor - Advanced Encryption Standard 128 bit
- org.apache.juddi.cryptor.AES256Cryptor - Advanced Encryption Standard 256 bit

4.2.2.3. jUDDI Client Providers (Java and .NET)

- org.apache.juddi.v3.client.crypto.DefaultCryptor - Password Based Encryption With MD5 and DES
- org.apache.juddi.v3.client.crypto.TripleDESCryptor - Triple DES 168 bit
- org.apache.juddi.v3.client.crypto.AES128Cryptor - Advanced Encryption Standard 128 bit
- org.apache.juddi.v3.client.crypto.AES256Cryptor - Advanced Encryption Standard 256 bit

4.2.2.3.1. Encrypting a Password

To encrypt a password, the jUDDI Tomcat server comes with a basic Windows Batch file and a Unix Bash script which will fire off the correct Java command. It is located at the following path:

```
{tomcat_home}/bin/juddi-cryptor.bat/sh
```



Tip

The jUDDI-Client (Java only) uses the same encryption keys and the jUDDI Server, therefore encrypted passwords using this tool will work with the jUDDI-client's configuration file.

In addition, an MD5 hashing program is included to assist with setting users passwords for the MD5XMLDocAuthenticator.

```
{tomcat_home}/bin/juddi-md5.bat/sh
```

4.2.2.4. jUDDI Authentication

The default authentication mechanism provided by jUDDI is the JUDDIAAuthenticator. The authenticate phase of the JUDDIAAuthenticator simply checks to see if the user id passed in has an associated record in the Publisher table. No credentials checks are made. If, during authentication, the publisher does not exist, the publisher is added on the fly.



Warning

Do not use jUDDI Default Authenticator in production. It does not compare passwords to anything!

The identify phase uses the publisher id to retrieve the Publisher record and return it. All necessary publisher properties are populated as Publisher inherits from UddiEntityPublisher.

```
juddi/auth/authenticator/class = org.apache.juddi.auth.JUDDIAAuthentication
```

4.2.2.5. XMLDocAuthentication

The XMLDocAuthentication implementation needs a XML file on the classpath. The juddiv3.xml file would need to look like

```
juddi/auth/authenticator/class = org.apache.juddi.auth.XMLDocAuthentication  
juddi/auth/usersfile = juddi-users.xml
```

where the name of the XML can be provided but it defaults to juddi-users.xml, and the content of the file would look something like

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
```

```
<juddi-users>
  <user userid="anou_mana" password="password" />
  <user userid="bozo" password="clown" />
  <user userid="sviens" password="password" />
</juddi-users>
```

The authenticate phase checks that the user id and password match a value in the XML file. The identify phase simply uses the user id to populate a new UddiEntityPublisher.

4.2.2.6. CryptedXMLDocAuthentication

The CryptedXMLDocAuthentication implementation is similar to the XMLDocAuthentication implementation, but the passwords are encrypted.

```
juddi/auth/authenticator/class =
  org.apache.juddi.auth.CryptedXMLDocAuthentication
juddi/auth/usersfile = juddi-users-encrypted.xml
juddi/cryptor = org.apache.juddi.cryptor.DefaultCryptor
```

where the name user credential file is juddi-users-encrypted.xml, and the content of the file would look something like

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<juddi-users>
  <user userid="anou_mana" password="+j/kXkZJftwTFTBH6Cf6IQ==" />
  <user userid="bozo" password="Na2Ait+2aW0=" />
  <user userid="sviens" password="+j/kXkZJftwTFTBH6Cf6IQ==" />
</juddi-users>
```

The DefaultCryptor implementation uses BEWithMD5AndDES and Base64 to encrypt the passwords. Note that the code in the AuthenticatorTest can be used to learn more about how to use this Authenticator implementation. You can plugin your own encryption algorithm by implementing the org.apache.juddi.cryptor.Cryptor interface and referencing your implementation class in the juddi.cryptor property. The authenticate phase checks that the user id and password match a value in the XML file. The identify phase simply uses the user id to populate a new UddiEntityPublisher.

4.2.2.7. MD5XMLDocAuthenticator

The MD5XMLDocAuthenticator implementation is similar to the XMLDocAuthentication implementation, but the passwords are hashed using MD5.

```
juddi/auth/authenticator/class =
  org.apache.juddi.auth.MD5XMLDocAuthenticator
juddi/auth/usersfile = juddi-users-hashed.xml
juddi/cryptor = org.apache.juddi.cryptor.DefaultCryptor
```

where the name user credential file is `juddi-users-encrypted.xml`, and the content of the file would look something like

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<juddi-users>
  <user userid="anou_mana" password="+j/kXkZJftwTFTBH6Cf6IQ==" />
  <user userid="bozo" password="Na2Ait+2aW0=" />
  <user userid="sviens" password="+j/kXkZJftwTFTBH6Cf6IQ==" />
</juddi-users>
```

The `DefaultCryptor` implementation uses `BEWithMD5AndDES` and `Base64` to encrypt the passwords. Note that the code in the `AuthenticatorTest` can be used to learn more about how to use this `Authenticator` implementation. You can plugin your own encryption algorithm by implementing the `org.apache.juddi.cryptor.Cryptor` interface and referencing your implementation class in the `juddi.cryptor` property. The `authenticate` phase checks that the user id and password match a value in the XML file. The `identify` phase simply uses the user id to populate a new `UddiEntityPublisher`.

4.2.2.8. LDAP Authentication

`LdapSimpleAuthenticator` provides a way of authenticating users using LDAP simple authentication. It is fairly rudimentary and more LDAP integration is planned in the future, but this class allows you to authenticate a user based on an LDAP principal, provided that the principal (usually the distinguished name) and the juddi publisher ID are the same.

To use this class you must add the following properties to the `juddi3v.xml` file:

```
juddi/auth/authenticator/class=org.apache.juddi.auth.LdapSimpleAuthenticator
juddi/auth/authenticator/url=ldap://localhost:389
juddi/auth/authenticator/style=simple
```

The `juddi/auth/authenticator/url` property configures the `LdapSimpleAuthenticator` class so that it knows where the LDAP server resides. Future work is planned in this area to use the LDAP uid rather than the LDAP principal as the default publisher id.

`LdapExpandedAuthenticator` provides a slightly more flexible way to authenticate users via LDAP.

```
juddi/auth/authenticator/
class=org.apache.juddi.v3.auth.LdapSimpleAuthenticator
juddi/auth/authenticator/url=ldap://localhost:389
juddi/auth/authenticator/style=simple
juddi/auth/authenticator/ldapexp=CN=%s, OU=Users,DC=Domain, etc
```

4.2.2.9. JBoss Authentication

Finally is it possible to hook up to third party credential stores. If for example `jUDDI` is deployed to the `JBoss` Application server it is possible to hook up to its authentication machinery. The

`JBossAuthenticator` class is provided in the `docs/examples/auth` directory. This class enables jUDDI deployments on JBoss use a server security domain to authenticate users.



Tip

The JBoss authentication is not distributed with jUDDI. It can be found here: <http://svn.apache.org/viewvc/juddi/extras/jbossauthenticator/src/org/apache/juddi/auth/JBossAuthenticator.java?view=markup>

To use this class you must add the following properties to the `juddiv3.xml` file:

```
juddi/auth/authenticator/class=org.apache.juddi.auth.JBossAuthenticator
juddi/auth/securityDomain=java:/jaas/other
```

The `juddi/auth/authenticator/class` property plugs the `JBossAuthenticator` class into the jUDDI the Authenticator framework. The `juddi/sercuityDomain`, configures the `JBossAuthenticator` class where it can lookup the application server's security domain, which it will use to perform the authentication. Note that JBoss creates one security domain for each application policy element on the `$_JBASS_HOME/server/default/conf/login-config.xml` file, which gets bound to the server JNDI tree with name `java:/jaas/<application-policy-name></application-policy-name>`. If a lookup refers to a non existent application policy it defaults to a policy named `other`.

4.3. Configuration Database Connections

4.3.1. Derby Out-of-the-Box

By default jUDDI uses an embedded Derby database. This allows us to build a downloadable distribution that works out-of-the-box, without having to do any database setup work. We recommend switching to an enterprise-level database before going to production. JUDDI uses the Java Persistence API (JPA) in the back end and we've tested with both OpenJPA and Hibernate. To configure which JPA provider you want to use, you will need to edit the configuration in the `juddiv3.war/WEB-INF/classes/META-INF/persistence.xml`. The content of this file is pretty standard between JPA implementations, however there can be slight differences. To make it easy we created different versions for different JPA implementations and target platforms. All JPA implementation have an enhancement phase, where the persistence *model* classes are enhanced. Hibernate does this at runtime, OpenJPA prefers doing this at compile time. This is the reason we ship two versions of `juddi-core`, where the `juddi-core-openjpa.jar` contains classes (byte-code) enhanced by OpenJPA. This is the reason this jar is larger then the `juddi-core.jar`.

For Hibernate, for testing the content of this file looks like

```
<?xml version="1.0" encoding="UTF-8"?>
<persistence xmlns="http://java.sun.com/xml/ns/persistence"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://java.sun.com/xml/ns/persistence
```

Derby Out- of-

```
http://java.sun.com/xml/ns/persistence/persistence_1_0.xsd"
version="1.0">
  <persistence-unit name="juddiDatabase" transaction-
type="RESOURCE_LOCAL">
    <provider>org.hibernate.ejb.HibernatePersistence</provider>
    <jta-data-source>java:comp/env/jdbc/JuddiDS</jta-data-source>
    <!-- entity classes -->
    <class>org.apache.juddi.model.Address</class>
    <class>org.apache.juddi.model.AddressLine</class>
    ...
    <class>org.apache.juddi.model.UddiEntity</class>
    <class>org.apache.juddi.model.UddiEntityPublisher</class>

    <properties>
      <property name="hibernate.archive.autodetection" value="class" />
      <property name="hibernate.hbm2ddl.auto" value="update" />
      <property name="hibernate.show_sql" value="false" />
      <property name="hibernate.dialect"
value="org.hibernate.dialect.DerbyDialect" />
    </properties>
  </persistence-unit>
</persistence>
```

For OpenJPA the persistence.xml looks like

```
<?xml version="1.0" encoding="UTF-8"?>
<persistence xmlns="http://java.sun.com/xml/ns/persistence"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://java.sun.com/xml/ns/persistence
http://java.sun.com/xml/ns/persistence/persistence_1_0.xsd"
  version="1.0">
  <persistence-unit name="juddiDatabase" transaction-type="RESOURCE_LOCAL">
    <provider>org.apache.openjpa.persistence.PersistenceProviderImpl</
provider>
    <non-jta-data-source>java:comp/env/jdbc/JuddiDS</non-jta-data-source>
    <!-- entity classes -->
    <class>org.apache.juddi.model.Address</class>
    <class>org.apache.juddi.model.AddressLine</class>
    ...
    <class>org.apache.juddi.model.UddiEntity</class>
    <class>org.apache.juddi.model.UddiEntityPublisher</class>
    <properties>
      <property name="openjpa.jdbc.SynchronizeMappings"
value="buildSchema(SchemaAction='add')" />
      <property name="openjpa.Log" value="DefaultLevel=WARN, Tool=INFO" />
      <property name="openjpa.jdbc.UpdateManager" value="operation-order" />
      <property name="openjpa.jdbc.DBDictionary" value="derby" />
      <!-- dialects: derby, postgres, mysql, oracle, sybase, sqlserver
for a complete list check the OpenJPA documentation -->
```


Switching

to

another

```
<property name="openjpa.RuntimeUnenhancedClasses" value="warn" />
<property name="openjpa.Compatibility"
value="CheckDatabaseForCascadePersistToDetachedEntity=true" />
</properties>
</persistence-unit>
</persistence>
```

In this case we reference a *jta-data-source* called *java:comp/env/jdbc/JuddiDS*. Datasource deployment is Application Server specific. If you are using Tomcat, then the datasource is defined in *juddi/META-INF/context.xml* which by default looks like

```
<?xml version="1.0" encoding="UTF-8"?>
<Context>
  <WatchedResource>WEB-INF/web.xml</WatchedResource>
  <Resource name="jdbc/JuddiDS" auth="Container"
    type="javax.sql.DataSource" username="" password=""
    driverClassName="org.apache.derby.jdbc.EmbeddedDriver"
    url="jdbc:derby:juddi-derby-test-db;create=true"
    maxActive="8"
  />
</Context>
```

By default the *juddiv3.war* is configured to be used on Tomcat using OpenJPA. However the download bundle lets you specify different target platforms resulting in a different setup. In all cases it will point to the embedded Derby database.

4.3.2. Switching to another Database

We recommend switching to an enterprise-level database before going to production. Most JPA providers support a large number of Databases and switching to another database is achieved by updating the configuration settings in both the *persistence.xml* and *datasource* files. The recipe is:

- change the database dialect in the *persistence.xml*.
- change the database connection information in the *datasource*.
- add the database specific driver to your classpath.
- in some cases (Oracle is one such case) you will need to use sequences for the ID generation, in this case you will need an *orm.xml* file. We ship a *orm.xml.example* along side the *persistence.xml*. Rename this file and update this to your liking.

Some examples for specific databases are given below.

Switch
to
MySQL



Warning

Tomcat copies the *context.xml* to *<tomcat>/conf/CATALINA/localhost/juddiv3.xml*, and if you update the *context.xml* it may not update this copy. You should simply delete the *juddiv3.xml* file after updating the *context.xml*.

4.3.3. Switch to MySQL on Tomcat using OpenJPA

Check if you have are using Hibernate of OpenJPA, by looking at the jars in the *juddiv3.war/WEB-INF/lib*. Edit the dialect in the *persistence.xml* For OpenJPA:

```
<property name="openjpa.jdbc.DBDictionary" value="mysql" />
```

Next edit the datasource. For tomcat you need to update the *juddiv3/META-INF/context.xml* which should look something like

```
<?xml version="1.0" encoding="UTF-8"?>
<Context>
  <WatchedResource>WEB-INF/web.xml</WatchedResource>
  <Resource name="jdbc/JuddiDS" auth="Container"
    type="javax.sql.DataSource" username="root" password=" "
    driverClassName="com.mysql.jdbc.Driver"
    url="jdbc:mysql://localhost:3306/juddiv3"
    maxActive="8" />
</Context>
```

Finally you need to add the MySQL mysql driver (i.e. The *mysql-connector-java-5.1.6.jar*) to the classpath. Note that this jar may already be in the *tomcat/lib* directory, in which case you can move on to the step and create the mysql juddiv3 database. To create a MySQL database name juddiv3 use

```
mysql> create database juddiv3
```

and finally you probably want to switch to a user which is a bit less potent than *root*, and delete the *<tomcat>/conf/CATALINA/localhost/juddiv3.xml* file.

4.3.4. Switch to Postgres on Tomcat using OpenJPA

Check if you have are using Hibernate of OpenJPA, by looking at the jars in the *juddiv3.war/WEB-INF/lib*. Edit the dialect in the *persistence.xml* For OpenJPA:

```
<property name="openjpa.jdbc.DBDictionary" value="postgres" />
```

Next edit the datasource. For tomcat you need to update the *juddiv3/META-INF/context.xml* which should look something like

Switch to Postgres

```
<?xml version="1.0" encoding="UTF-8"?>
<Context>
  <WatchedResource>WEB-INF/web.xml</WatchedResource>
  <Resource name="jdbc/JuddiDS" auth="Container"
    type="javax.sql.DataSource" username="juddi" password="juddi"
    driverClassName="org.postgresql.Driver"
    url="jdbc:postgresql://localhost:5432/juddi"
    maxActive="8"/>
</Context>
```

To create a MySQL database name *juddi* use

```
postgres= CREATE USER juddi with PASSWORD 'password';
postgres= CREATE DATABASE juddi;
postgres= GRANT ALL PRIVILEGES ON DATABASE juddi to juddi;
```

Be sure to have *postgresql-8.3-604.jdbc4.jar* to the classpath. Note that this jar may already be in the *tomcat/lib* directory, in which case the final step is to delete the *<tomcat>/conf/CATALINA/localhost/juddiv3.xml* file.

4.3.5. Switch to Postgres on JBoss using Hibernate

This was written from a JBoss - jUDDI perspective. Non-JBoss-users may have to tweak this a little bit, but for the most part, the files and information needed is here. Logged in as postgres user, access psq:

```
postgres= CREATE USER juddi with PASSWORD 'password';
postgres= CREATE DATABASE juddi;
postgres= GRANT ALL PRIVILEGES ON DATABASE juddi to juddi;
```

Note, for this example, my database is called *juddi*, as is the user who has full privileges to the database. The user *juddi* has a password set to *password*. Next edit the *juddi-ds.xml* datasource file with the settings for the postgres connection info:

```
<datasources>
  <local-tx-datasource>
    <jndi-name>JuddiDS</jndi-name>
    <connection-url>jdbc:postgresql://localhost:5432/juddi</connection-
url>
    <driver-class>org.postgresql.Driver</driver-class>
    <user-name>juddi</user-name>
    <password>password</password>
    <!-- sql to call when connection is created. Can be anything,
select 1 is valid for PostgreSQL
    <new-connection-sql>select 1</new-connection-sql>
    -->
```

Switch to Oracle

```
<!-- sql to call on an existing pooled connection when it is
obtained
from pool. Can be anything, select 1 is valid for PostgreSQL
<check-valid-connection-sql>select 1</check-valid-connection-sql>
-->
<!-- corresponding type-mapping in the standardjbosscomp-jdbc.xml -->
<metadata>
    <type-mapping>PostgreSQL 8.0</type-mapping>
</metadata>
</local-tx-datasource>
</datasources>
```

In *persistence.xml*, reference the correct JNDI name of the datasource and remove the derby Dialect and add in the postgresql Dialect, for Hibernate on JBoss use:

```
<jta-data-source>java:comp/env/jdbc/JuddiDS</jta-data-source>
...
<property name="hibernate.dialect"
    value="org.hibernate.dialect.PostgreSQLDialect"/>
```

Be sure to have *postgresql-8.3-604.jdbc4.jar* in the *lib* folder.

4.3.6. Switch to Oracle on Tomcat using Hibernate

To switch over to Oracle you need to add the oracle driver (i.e. the *_classes12.jar_*) to the classpath and you will need to edit the *persistence.xml*

```
<property name="hibernate.dialect"
    value="org.hibernate.dialect.Oracle10gDialect"/>
```

To create a Oracle database name *juddiv3* with the ultimate in minimalism use

```
sqlplus> create database juddiv3;
```

then you probably want to switch to a user which is a bit less potent than *root* and set the appropriate password, and delete the *<tomcat>/conf/CATALINA/localhost/juddiv3.xml*

4.3.6.1. Changing the Oracle Sequence name

If you are using Hibernate as a persistence layer for jUDDI, then Oracle will generate a default sequence for you ("HIBERNATE_SEQUENCE"). If you are using hibernate elsewhere, you may wish to change the sequence name so that you do not share this sequence with any other applications. If other applications try to manually create the default hibernate sequence, you may even run into situations where you find conflicts or a race condition.

The easiest way to handle this is to create an *orm.xml* file and place it within the classpath in a META-INF directory, which will override the jUDDI persistence annotations and will allow

Switch

to

HSQL

you to specify a specific sequence name for use with JUDDI. The `orm.xml.example` specifies a "juddi_sequence" sequence to be used with JUDDI. Rename this file and update it to your liking.

4.3.7. Switch to HSQL on Tomcat using Hibernate

First make sure you have a running hsqldb. For a standalone server startup use:

```
java -cp hsqldb.jar org.hsqldb.server.Server --port 1747 --database.0
file:juddi --dbname.0 juddi
```

Next, connect the client manager to this instance using:

```
java -classpath hsqldb.jar org.hsqldb.util.DatabaseManagerSwing --driver
org.hsqldb.jdbcDriver --url jdbc:hsqldb:hsq://localhost:1747/juddi -user
sa
```

and create the juddi user:

```
CREATE USER JUDDI PASSWORD "password" ADMIN;
CREATE SCHEMA JUDDI AUTHORIZATION JUDDI;
SET DATABASE DEFAULT INITIAL SCHEMA JUDDI;
ALTER USER juddi set initial schema juddi;
```

From now on, one can connect as JUDDI user to that database and the database is now ready to go. To switch JUDDI over to HSQL you need to add the hsql driver (i.e. The `hsqldb.jar`) to the classpath and you will need to edit the `persistence.xml`

```
<property name="hibernate.dialect"
value="org.hibernate.dialect.HSQLDialect"/>
```

and the `datasource`. For tomcat you the `context.xml` should look something like

```
<?xml version="1.0" encoding="UTF-8"?>
<Context>
  <WatchedResource>WEB-INF/web.xml</WatchedResource>
  <!-- HSQL data source -->
  <Resource name="jdbc/JuddiDS" auth="Container"
    type="javax.sql.DataSource" username="JUDDI" password="password"
    driverClassName="org.hsqldb.jdbcDriver"
    url="jdbc:hsqldb:hsq://localhost:1747/juddi"
    maxActive="8"/>
</Context>
```

4.3.8. Switch to other db

If you use another database, please document, and send us what you had to change to make it work and we will include it here.

Override
persistence
properties

4.3.9. Override persistence properties in the juddiv3.xml

The juddiv3.xml file can be externalized; if you give the path of juddiv3.xml in the JVM args, the juddiv3.xml will not be picked up from the WAR. To use this set the *juddi.propertiesFile* to a location of your configuration file. This allows the user to change the jUDDI properties without having to open up the juddiv3.war file. For this use case it makes sense that also persistence properties can be overridden as well in the juddiv3.xml file. The following properties can be set:

Table 4.1. Hibernate properties that can be referenced in the *juddiv3.xml* file

property name	description	example value
persistenceProvider	JPA Implementation	Hibernate
hibernate.connection.datasource	datasource name	java:/jdbc/JuddiDS
hibernate.hbm2ddl.auto	hibernate to ddl setting	java:/jdbc/JuddiDS
hibernate.default_schema	Schema name	JuddiSchema
hibernate.dialect	DataBase vendor name	org.hibernate.dialect.DB2Dialect

4.4. Logging

The jUDDI codebase uses the *commons-logging-api*, and *log4j* as the default logging implementation. The *juddiv3/WEB-INF/classes/commons-logging.properties* sets the logging to *log4j*. The default *log4j* configuration logs to a *juddi.log* file in the *tomcat/logs* directory. The *log4j* configuration lives in the *juddiv3/WEB-INF/classes/log4j.properties* file, which is referenced in the *web.xml*

```
<context-param>
  <param-name>log4jConfigLocation</param-name>
  <param-value>/WEB-INF/classes/log4j.properties</param-value>
</context-param>
```

The *commons-logging* and *log4j* jars are shipped in the *juddiv3/WEB-INF/lib* directory.

If you are using CXF for the webservice stack you can log the request/response xml by adding

```
log4j.category.org.apache.cxf=INFO
```

to your *log4j.properties* and the *cxf.xml* file should contains this:

```
<cxf:bus>
  <cxf:features>
    <cxf:logging/>
  </cxf:features>
</cxf:bus>
```

The jUDDI *beans.xml* specifies the location of this file at *META-INF/cxf/cxf.xml*.

4.5. Administering the GUI (juddi-gui.war)

There are a few things worth mentioning for administering the jUDDI Graphical User Interface. The first is user authentication, which is covered in the authentication chapter. The other the the Digital Signature Applet. This applet enables users to digitally signed UDDI entities via the GUI. There are a number of requirements in order for this to work.

- The applet must be digitally signed. It is recommended that this signed by the administrator using the SSL certificate of the jUDDI instance. If it is not signed, it may not be able to digital certificates.
- The Oracle Java browser plugin must be installed. For details on this, visit Oracle's website.
- The end user must have a digital certificate installed that is accessible to the browser. On Windows computers, this is supported by Internet Explorer, Opera and Chrome which use the Windows Certificate Store (Start > Run > MMC, Add Certificates). Firefox uses its own certificate store. On MacOS, Safari uses the Mac Keychain.

4.6. Task: Signing the Digital Signature Applet jar file

```
jarsigner -keystore your.keystore -storepass yourpass -keypass keypass  
<pathto>/juddi-gui.war/applets/juddi-gui-dsig-all.jar
```

Note: Jarsigner comes with most JDKs and has many command line options.

4.7. Administrating your jUDDI Instance using the Administrative Console

Your instance of the jUDDI (juddiv3.war) can be managed via the administration console. It can be access url the following URL:

```
http://localhost:8080/juddiv3/admin
```

By default, only users with the role "uddiadmin" are allowed to access this page. In addition, it must be accessed from the same computer hosting juddiv3.war (this can be changed if needed). When accessing the URL, you should be prompted for login via username/password (this can also be changed to another mechanism).

After authenticating, you will be prompted with a very similar interface to the juddi-gui.war. From here, you can perform a number of tasks.

- Access Status and Statistics of jUDDI

- Configure jUDDI (juddiv3.war)
- Access the jUDDIv3 API, which provides a number of administrative tasks and functions (requires an additional login)*

*Why is there another login required for the jUDDIv3 API functions?

The answer is because the admin console will be directly accesses a web service and it requires a user account with juddi admin rights. This may be the same username you use to access the admin console (juddiv3.war/admin) but unfortunately, this double login is unavoidable.

4.8. Configure jUDDI

From the browser, it is possible to configure jUDDI's web services via the web browser. All of the settings available from the chapter on configuring jUDDI can be set there.

4.8.1. Enabling Remote Access

The jUDDI Configuration page by default is only accessible via the same host that is hosting the server. To enable remote access, change the setting

```
config/props/configLocalHostOnly=true
```

To false.

Enabling Remote Access

Configure jUDDI

Just click to edit each field, then click save when you are done. (Not all fields can be modified)

Loaded from: file:///C:/juddi/trunk/cur/juddi-tomcat/target/tomcat/apache-tomcat-6.0.26/webapps/juddi3/WEB-INF/classes/juddi3.xml

Server Config

Field	Value
juddi.server.baseUrl	http://localhost:8080/juddi3
juddi.nodeId	uddi:juddi.apache.org/node1
juddi.root.publisher	root
juddi.root.businessId	uddi:juddi.apache.org/businesses-asf
juddi.root.partition	uddi:juddi.apache.org
juddi.seed.always	false
juddi.persistence单位名称	juddiDatabase
juddi.configuration.reload.delay	2000
juddi.locale	en_US
juddi.operator.mailAddress	BETA - v3.2.0 SNAPSHOT - © 2013 The Apache Software Foundation. All Rights Reserved. admin@jocax.localhost
juddi.maxNameLength	255
juddi.maxNameElementsAllowed	5
juddi.maxRows	1000
juddi.maxInClause	1000
juddi.maxBusinessesPerPublisher	100
juddi.maxServicesPerBusiness	100
juddi.maxBindingsPerService	100
juddi.maxTModelsPerPublisher	100
juddi.transfer.expiration.days	3
juddi.subscription.expiration.days	30
juddi.subscription.chunkExpiration.minutes	5
juddi.subscription.maxEntities	1000
juddi.uuidgen	org.apache.juddi.uuidgen.DefaultUUIDGen
juddi.cryptor	org.apache.juddi.cryptor.DefaultCryptor
juddi.keygenerator	org.apache.juddi.keygen.DefaultKeyGenerator
juddi.notification.interval	5000
juddi.notification.start.buffer	0
juddi.notification.acceptableLagTime	1000
juddi.notification.maxTries	3
juddi.notification.maxTriesResetInterval	600000
juddi.notification.sendAuthTokenWithResultList	false
juddi.auth.inquiry	false
juddi.auth.authenticator.class	org.apache.juddi.v3.auth.JUDDIAuthenticator
juddi.auth.token.Timeout	15
juddi.auth.token.Expiration	15
juddi.validation.enforceReferentialIntegrity	true
juddi.mail.smtp.socketFactory	Click to edit

Admin Console Config (this web site)

Loaded from: file:///C:/juddi/trunk/cur/juddi-tomcat/target/tomcat/apache-tomcat-6.0.26/webapps/juddi3/WEB-INF/classes/META-INF/juddi.xml

Field	Value
client.signature.signingKeyStorePath	Click to edit
client.signature.signingKeyStoreType	JKS
client.signature.signingKeyStoreFilePassword[@cryptoProvider]	org.apache.juddi.v3.client.crypto.AES128Cryptor
client.signature.signingKeyStoreFilePassword[@isPasswordEncrypted]	false
client.signature.signingKeyPassword[@cryptoProvider]	org.apache.juddi.v3.client.crypto.AES128Cryptor
client.signature.signingKeyPassword[@isPasswordEncrypted]	false
client.signature.signingKeyAlias	(not used)

Figure 4.1. jUDDI Server Configuration Page.

Monitoring
the
Status
and
Statistics

4.9. Monitoring the Status and Statistics

The Statistics and Status page provides valuable information to administrators and developers looking to trouble shoot or debug problems with jUDDI.

4.9.1. Statistics

The Statistics page provides you with access to usage counts and time spent processing on each method of each service that jUDDI provides.



Tip

This information can be pulled and is available in JSON encoded data from the following URL: <http://localhost:8080/juddiv3/admin/mbeans.jsp>

Status and Statistics

[Status](#)
[Statistics](#)

Failed API Queries	0
Successful API Queries	0
Total API Queries	0
add_publisherassertions failed queries	0
add_publisherassertions processing time	0
add_publisherassertions successful queries	0
add_publisherassertions total queries	0
delete_binding failed queries	0
delete_binding processing time	0
delete_binding successful queries	0
delete_binding total queries	0
delete_business failed queries	0
delete_business processing time	0
delete_business successful queries	0
delete_business total queries	0
delete_publisherassertions failed queries	0
delete_publisherassertions processing time	0
delete_publisherassertions successful queries	0
delete_publisherassertions total queries	0
delete_service failed queries	0
delete_service processing time	0
delete_service successful queries	0
delete_service total queries	0
delete_subscription failed queries	0
delete_subscription processing time	0
delete_subscription successful queries	0
delete_subscription total queries	0
delete_tmodel failed queries	0
delete_tmodel processing time	0
delete_tmodel successful queries	0
delete_tmodel total queries	0
discard_authToken failed queries	0
discard_authToken processing time	0
discard_authToken successful queries	0
discard_authToken total queries	0
discard_transferToken failed queries	0
discard_transferToken processing time	0
discard_transferToken successful queries	0
discard_transferToken total queries	0
find_binding failed queries	0
find_binding processing time	0
find_binding successful queries	0
find_binding total queries	0
find_business failed queries	0
find_business processing time	533
find_business successful queries	4
find_business total queries	4
find_relatedBusinesses failed queries	0
find_relatedBusinesses processing time	60

Figure 4.2. jUDDI Server Statistics.

or you can hook up the jconsole to look at the jUDDI mbeans

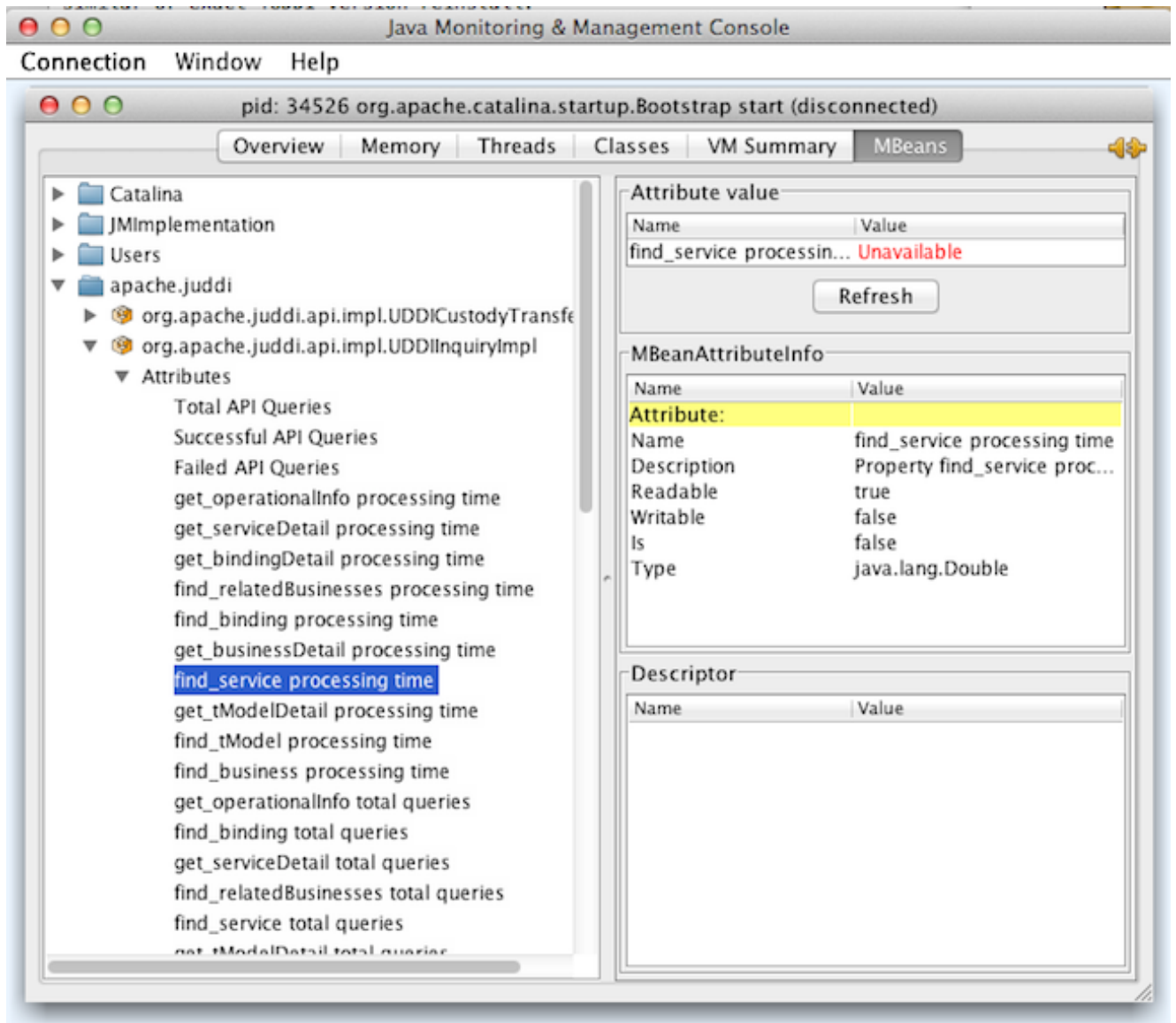


Figure 4.3. jUDDI MBeans.

4.9.2. Status

The Status page gives you the former "Happy jUDDI" page from version 2 of jUDDI.

The screenshot displays the 'Status and Statistics' page of the jUDDI application. At the top, there is a navigation bar with 'Home', 'Status', 'Configure', 'Admin', and 'Help' links, along with fields for 'Username' and 'Password', and a 'Login' button. The main heading is 'Status and Statistics', with a sub-tab for 'Statistics'. Below this, a 'Happy jUDDI!' message is followed by 'jUDDI Version Information' showing 'jUDDI Version: 3.2.0 SNAPSHOT' and 'UDDI Version: 3.0'. The 'jUDDI Dependencies: Class Files & Libraries' section lists various dependencies like 'org.apache.juddi.servlets.RegistryServlet' and 'org.springframework.web.context.ContextLoaderListener', with some marked as 'Found in' or '-Not Found'. The 'jUDDI Dependencies: Resource & Properties Files' section lists files like 'log4j.properties', 'juddi.xml', and 'context.xml'. The 'jUDDI DataSource Validation' section shows a successful connection to a 'JNDI Context' but a failed 'DB connection' with the error: 'DB connection was not acquired. (Cannot create JDBC driver of class '' for connect URL 'null')'. The 'System Properties' section lists various system settings such as 'awt.toolkit', 'catalina.base', 'java.class.path', and 'java.library.path'.

Figure 4.4. jUDDI Server Status.

4.10. Accessing the jUDDIv3 API

The jUDDI API is a web service that extends the UDDI specification. It provides various functions for both configuring the jUDDI server and for performing administrative functions, such as authorizing a new username as a publisher, user rights assignment and so on. This page will let you access the functions from the web browser.



Tip

You must authenticate using the top right hand side login/password box in order to use this.

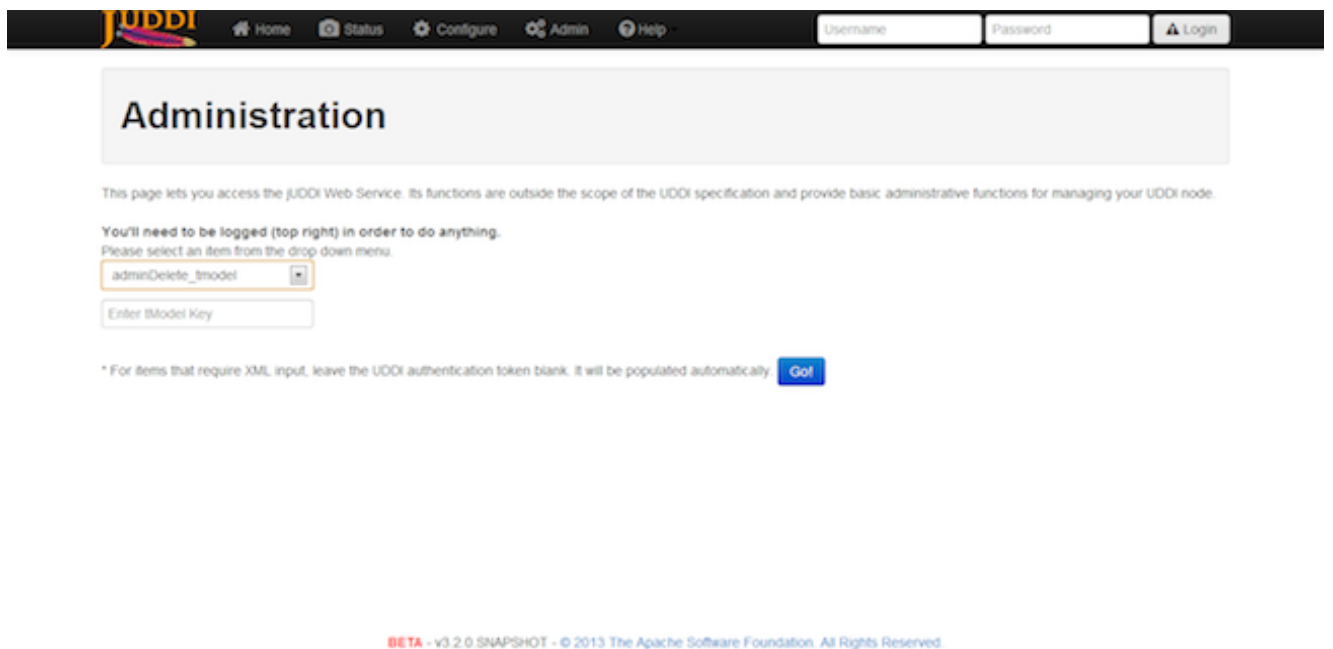


Figure 4.5. jUDDI API.

4.11. Security Guidance

This guide contains general security guidelines to ensure that your jUDDI server and jUDDI Client based application are relatively safe and to prevent unauthorized users.

This section is broken down into guidance for the jUDDI server and for the jUDDI Client

4.11.1. jUDDI Server

- Always use SSL or TLS for connections to and from the jUDDI server, especially connections where authentication is used. Use encrypted connections to the database server when possible. client configs (uddi.xml), database (juddiv3/WEB-INF/classes/META-INF/persistence.xml)

jUDDI

Client

(and

- If the juddi-gui web app is not on the same server as the juddiv3 web services web app, use SSL or TLS. (juddi-gui/WEB-INF/classes/META-INF/uddi.xml)

- Use UDDI Digital Signatures where appropriate. Enable all validation options. Java/.NET Clients + juddi-gui, uddi.xml uddi/client/signatures, checkTimestamps,checkTrust,checkRevocationCRL
- Require authentication for Inquiry API. (config/juddi/auth/Inquiry=true)
- Use a LDAP user store and set passwords to expire regularly. Enforce the usage of strong passwords of sufficient length and SSL for LDAP connections. (config/juddi/auth/token/authenticator)
- Encrypt all stored credentials (database, key stores, email, etc) with the highest possible encryption available. (config/juddi/cryptor=org.apache.juddi.v3.client.cryptor.AES256Cryptor or AES128)
- Configure Auth Tokens to expire with relatively short intervals. This should meet all automatic logout requirements and help reduce the risk that an intercepted auth token can't be reused by a 3rd party. (config/juddi/auth/token/Expiration) and (config/juddi/auth/token/Timeout)
- Configure Auth Tokens to require Same IP Enforcement. This is a mitigation factor for when a token is intercepted and attempted to be reused from another source. (config/juddi/auth/token/enforceSameIPRule=true)
- Configure Custody Transfer Tokens to expire with relatively short intervals. (config/juddi/transfer/expiration/days)
- Disable sending authentication tokens to subscription notifications (config/juddi/notification/sendAuthTokenWithResultList=false)

4.11.2. jUDDI Client (and developers)

- Never log auth tokens. Protect it as if it was a password
- Encrypt all stored credentials (key stores, UDDI credentials, etc) with the highest possible encryption available (uddi.xml)
- Discard auth tokens when they are no longer needed.

4.11.3. jUDDI GUI (Web user interface)

- Enable automatic logouts (WEB-INF/classes/META-INF/uddi.xml)
- All cached credentials are encrypted in the session tokens using an AES key that is generated at boot up time of the juddi-gui instance.

Backups,
Upgrading
and
Data

- Use SSL or TLS when connecting using your web browser to juddi-gui.
- ~~The juddi-gui uses cookies to store user preferences, such as language and the current node.~~
- The juddi-gui makes heavy use of JavaScript using JQuery and JQueryUI. Without a JavaScript enabled browser that supports AJAX, the juddi-gui will not be functional. This usually implies Firefox 1.6 or higher, IE 6, Chrome/Chromium (nearly all versions), Opera v8 or higher, and Safari v2 or higher.
- The juddi-gui uses a Java applet that is used for Digital Signature support. This runs within your web browser. The Java plugin for your web browser must be enabled in order to use this functionality. In addition, the applet itself must be digitally signed (usually performed by the administrator, see article on this).
- The juddi-gui has built in validation for digital signatures. This requires a trusted key store. Ensure that the passwords are encrypted using the highest available crypto class and that the validation settings are enabled.
- The juddi-gui has a settings pages for altering the uddi.xml configuration file. By default, this is only accessible from the same machine running juddi-gui (i.e. localhost). This behavior can be changed by either using the setting page from localhost or by manually editing the uddi.xml page. Unless required, the recommended setting is to prevent remote configuration changes. If the settings page isn't required, it can be removed.
- The juddi-gui has a settings page that is password protected to prevent unauthorized changes. Use the strongest available mechanism to protect credentials. The default configuration is for HTTP BASIC. It is recommended to use this with SSL/TLS and/or switch to DIGEST based authentication. If the settings page isn't required, it can be removed.

Migration

4.12. Backups, Upgrading and Data Migration

There are several different strategies for managing your jUDDI backups.

4.12.1. Database Backups

Database backups are vendor specific and are effective for backup/restore to a similar or exact jUDDI version reinstall.

4.12.2. Config Backup

Aside from database backups, you should also make backup copies of all jUDDI configuration files and any files that you have customized to meet your operational needs.

4.13. Upgrading jUDDI

Sometimes, the jUDDI development team has no choice but to alter the database schema. In many cases, OpenJPA or Hibernate (both Java Persistence API providers) will automatically alter database columns when a new version is installed. In some cases, there may actually be data loss.



Tip

Check the jUDDI distribution notes before attempting an upgrade.



Important

Always perform a database level backup of your instance before attempting the upgrade.

4.14. Scaling jUDDI and Federation

The capabilities and components provided by jUDDI are designed to scale. The following will describe the options and known limitations of jUDDI.

4.14.1. Scaling the jUDDI Services (multiple servers)

The jUDDI web services (juddiv3.war) is designed to be scaled to multiple servers in a number of ways. The following sub sections outline the available options.

4.14.1.1. Scaling using a common database

The first and simplest mechanism is for the instances of juddiv3.war to share the same database. All of jUDDI's database calls are transactional SQL, meaning that concurrent changes will function just fine from multiple concurrent users. Each instance of juddiv3.war must point to the same database and must use the same Node ID. See the Database Configuration Chapter for more information.

4.14.1.2. Scaling using Subscriptions

The second mechanism is to use the Subscription API to import data and updates from a remote registry. Unfortunately, this scenario isn't quite yet supported for jUDDI, but will be in a future release.

4.14.1.3. Replication API

The third mechanism is the Replication API, which is part of the OASIS UDDIv3 specification. jUDDI unfortunately does not currently implement this specification but may in the future.

4.14.2. Limitations of jUDDI

jUDDI's web services have no explicit upper bound on the volume of businesses and services registered. Load testing has shown that at least 10,000 are support for each category. The upper limit is more of a function of both the underlying database implementation and hardware (free disk space). In either case, the likelihood of hitting the limit is low for most instances. If you happen to

Limitations
of
jUDDI

run into scaling issues, please file a bug report at JUDDI's JIRA site at: <https://issues.apache.org/jira/browse/JUDDI>

Chapter 5. jUDDI Server Configuration (`juddiv3.xml`)

jUDDI will look for a `juddiv3.xml` file on the root of the classpath. In the `juddiv3.war` you can find it in `juddiv3.war/WEB_INF/classes/juddiv3.xml`.

Since 3.2 the jUDDI server now uses an XML file for configuration. Previous versions uses a properties file.



Important

When referring to configuration *properties*, we are really referencing the XPath to specified setting.

5.1. Authentication

Table 5.1. Authentication properties that can be referenced in the `juddiv3.xml` file

Property Name	Description	Required	Default Value or [Example Value]
<code>juddi/auth/authenticator/class</code>	The jUDDI authenticator class to use. See Chapter <add ref> of the Userguide for the choices provided.	N	<code>org.apache.juddi.v3.auth.JUDDIAuthenticat</code>
<code>juddi/auth/Inquiry</code>	This flag determines whether authentication (the presence of a <code>getAuthToken</code>) is required on queries invoking the Inquiry API. By default, jUDDI sets this to <code>false</code> for ease of use.	N	<code>false</code>
<code>juddi/auth/token/Timeout</code>	Time in minutes to expire tokens after inactivity.	N	<code>15</code>

Property Name	Description	Required	Default Value or [Example Value]
<i>juddi/auth/token/Expiration</i>	As of 3.1.5 Duration of time for tokens to expire, regardless of inactivity.	N	15
<i>juddi/auth/token/enforceSameIPRule</i>	As of 3.2 This setting will enable or disable the auth token check to ensure that auth tokens can only be used from the same IP address that they were issued to..	N	<i>true</i>

5.2. Startup

Table 5.2. Startup properties that can be referenced in the *juddiv3.xml* file

Property Name	Description	Required	Default Value or [Example Value]
<i>juddi/server/baseurl</i>	Token that can be accessed in accessPointURLs and resolved at runtime. Currently this is only used during the Installation process (seeding root data)	N	<i>http://localhost:8080</i>
<i>juddi/root/publisher</i>	The username for the jUDDI root publisher. This is usually just set to "root".	N	<i>root</i>
<i>juddi/seed/always</i>	Forces seeding of the jUDDI data. This will re-apply all files with the exception of the root data files. Note that this can lead to losing data that was added to the entities that are re-	N	<i>false</i>

Property Name	Description	Required	Default Value or [Example Value]
	seeded, since data is not merged.		
<i>juddi/server/name</i>	This token is referenced in the install data. Note that you can use any tokens, and that their values can be set here or as system parameters..	N	<i>false</i>
<i>juddi/server/port</i>	This token is referenced in the install data. Note that you can use any tokens, and that their values can be set here or as system parameters..	N	<i>false</i>
<i>juddi/nodeId</i>	The Node ID uniquely identifies this server. Use caution when changing the Node ID after jUDDI has been started, you may not be able to edit any existing entities! ..	N	<i>uddi:juddi.apache.org:node1</i>
<i>juddi/load/install/data</i>	This property allows you to cancel loading of the jUDDI install data.	N	<i>false</i>
<i>juddi/locale</i>	The default local to use. This currently is not used.	N	<i>en_US</i>
<i>juddi/operatorEmailAddress</i>	The UDDI Operator Contact Email Address. This currently is not used.	N	<i>admin@juddi.org</i>
<i>juddi/persistenceunit.name</i>	The persistence name for the jUDDI database that is	N	<i>juddiDatabase</i>

Property Name	Description	Required	Default Value or [Example Value]
	specified in the persistence.xml file.		
<i>juddi/configuration/reload/delay</i>	The time in milliseconds in which juddiv3.xml is polled for changes.	N	5000



Caution

Take caution in changing the jUDDI Node ID. If jUDDI has already been started at least once and the Node ID is changed, an existing records will not be editable. If you want to change from the default value, do so before you first start jUDDI by editing the configuration file.

5.3. Email

Table 5.3. As of 3.1.5, jUDDI supports Email delivery options for Subscription API functions. Email properties can be referenced in the *juddiv3.xml* file

Property Name	Description	Required	Default Value or [Example Value]
<i>juddi/mail/smtp/from</i>	The Operator's Email address	Y	[<i>jUDDI@example.org</i>]
<i>juddi/mail/smtp/host</i>	The hostname of the SMTP server	Y	[<i>localhost</i>]
<i>juddi/mail/smtp/port</i>	The portname of the SMTP server	Y	[25]
<i>juddi/mail/smtp/socketFactory.class</i>	If set, specifies the name of a class that implements the <i>javax.net.SocketFactory interface</i> . This class will be used to create SMTP sockets.	N	
<i>juddi/mail/smtp/socketFactory/fallback</i>	If set to true, failure to create a socket using the specified socket factory class	N	<i>true</i>

Property Name	Description	Required	Default Value or [Example Value]
	will cause the socket to be created using the <i>java.net.Socket</i> class. Defaults to true.		
<i>juddi/mail/smtp/starttls/enable</i>	if true, enables the use of the STARTTLS command (if supported by the server) to switch the connection to a TLS-protected connection before issuing any login commands. Note that an appropriate trust store must be configured so that the client will trust the server's certificate. Defaults to false.	N	<i>false</i>
<i>juddi/mail/smtp/socketFactory/port</i>	Specifies the port to connect to when using the specified socket factory. If not set, the default port will be used.	N	[465]
<i>juddi/mail/smtp/auth</i>	If true, attempt to authenticate the user using the AUTH command. Defaults to false.	N	[<i>false</i>]
<i>juddi/mail/smtp/user</i>	Username used to authenticate to the SMTP server	Y, if <i>juddi/mail/smtp/auth</i> is true	[<i>juddi@apache.org</i>]
<i>juddi/mail/smtp/password</i>	Username used to authenticate to the SMTP server	Y, if <i>juddi/mail/smtp/auth</i> is true	[<i>secret</i>]
<i>juddi/mail/smtp/password@encrypted</i>	If the password is encrypted, the	Y, if <i>juddi/mail/smtp/auth</i> is true	false

Query
Properties

Property Name	Description	Required	Default Value or [Example Value]
	setting juddi/cryptor is the Cryptographic provider used to decrypt at runtime.		

5.4. Query Properties

Table 5.4. Query properties that can be referenced in the *juddiv3.xml* file

Property Name	Description	Required	Default Value or [Example Value]
<i>juddi/maxBusinessesPerPublisher</i>	The maximum number of UDDI BusinessEntities that can be registered per publisher. A value of -1 indicates any number of businesses is allowed (These values can be overridden at the individual publisher level)	N	-1
<i>juddi/maxServicesPerBusiness</i>	The maximum number of UDDI BusinessServices allowed per Business. A value of -1 indicates any number of artifacts is valid (These values can be # overridden at the individual publisher level).	N	-1
<i>juddi/maxBindingsPerService</i>	The maximum number of UDDI TemplateBindings allowed per BusinessService. A value of -1 indicates any number of artifacts is valid	N	-1

Query
Properties

Property Name	Description	Required	Default Value or [Example Value]
	(These values can be overridden at the individual publisher level).		
<i>juddi/maxTModelsPerPublisher</i>	The maximum number of TModels allowed per publisher. A value of -1 indicates any number of artifacts is valid (These values can be overridden at the individual publisher level).	N	-1
<i>juddi/maxInClause</i>	The maximum number of "IN" clause parameters. Some RDMBS limit the number of parameters allowed in a SQL "IN" clause.	Y	[1000]
<i>juddi/maxNameElementsAllowed</i>	The maximum size and maximum number of name elements allows in several of the <i>FindXxxx</i> and <i>SaveXxxx</i> UDDI functions	N	[5]
<i>juddi/maxNameLength</i>	The maximum name size of name elements	N	[255]
<i>juddi/maxRows</i>	The maximum number of rows returned in a <i>find_*</i> operation. Each call can set this independently, but this property defines a global maximum. This is related to the	N	1000

RMI
Proxy

Property Name	Description	Required	Default Value or [Example Value]
	<i>maxInClause</i> setting (the same?).		

5.5. RMI Proxy

These properties are used to bring up RMI server socket. The settings allow for registering this service to JNDI. RMI Proxy properties that can be referenced in the *juddiv3.xml* file and is only used by RMItransport.

Property Name	Description	Required	Default Value or [Example Value]
<i>juddi/proxy/factory/initial</i>	JNDI Contact Factory	N	[<i>org.jnp.interfaces.NamingContextFactory</i>]
<i>juddi/proxy/provider/url</i>	JNDI Provider Address	N	[<i>jnp://localhost:1099</i>]
<i>juddi/proxy/factory/url/pkg</i>	JNDI Naming Convention	N	[<i>org.jboss.naming</i>]

5.6. Key Generation and Cryptography

Table 5.5. UDDI Key generation properties that can be referenced in the *juddiv3.xml* file.

Property Name	Description	Required	Default Value or [Example Value]
<i>juddi/cryptor</i>	jUDDI Cryptor implementation class that jUDDI will use to encrypt and decrypt password settings	N	<i>org.apache.juddi.cryptor.DefaultCryptor</i>
<i>juddi/keygenerator</i>	Key generator implementation that jUDDI will use to create UDDI keys if no key is passed in by the user.	N	<i>org.apache.juddi.keygen.KeyGenerator</i>
<i>_juddi/uuidgen _</i>	UUID generator implementation that jUDDI will use to create UUIDs.	N	<i>org.apache.juddi.uuidgen.DefaultUUIDGen</i>

5.7. Subscription

Table 5.6. Subscription properties that can be referenced in the *juddiv3.xml* file.

Property Name	Description	Required	Default Value or [Example Value]
<i>juddi/subscription/expiration/days</i>	Days before a subscription expires	N	[30]
<i>juddi/subscription/chunkexpiration/minutes</i>	Minutes before a "chunked" subscription call expires	N	[5]
<i>juddi/notification/interval</i>	Specifies the interval at which the notification timer triggers. This is the upper boundary set by the registry. Between the user defined <code>endDate</code> of a Subscription and this value, the registry will pick the earliest date.	N	3000000
<i>juddi/notification/start/buffer</i>	Specifies the amount of time to wait before the notification timer initially fires	N	20000
<i>juddi/notification/acceptableLagtime</i>	Specifies the amount of time (in ms) from which to determine if the server is overload and to skip notifications. Notifications during this cycle will not be repeated (i.e. never be delivered)	N	10000
<i>juddi/notification/maxTries</i>	Specifies the number of times to attempt the delivery	N	3

Custody
Transfer

Property Name	Description	Required	Default Value or [Example Value]
	of messages to subscribers.		
<i>juddi/notification/maxTriesResetInterval</i>	Once the maximum delivery attempts have been made, the server will add that endpoint to an ignore list, which is reset every N ms.	N	600000
<i>juddi/notification/sendAuthTokenWithResult</i>	Sends a valid authentication token for the owning user of the subscription in the subscription notification result message. Unless it is specifically needed, this is recommended to be set to false.	N	false

5.8. Custody Transfer

Table 5.7. Transfer properties that can be referenced in the `_juddiv3.xml` file.

Property Name	Description	Required	Default Value or [Example Value]
<i>juddi/transfer/expiration/days</i>	Days before a transfer request expires.	N	[3]

5.9. Validation

Table 5.8. These settings are for validating the data that users store in Juddi. They can be referenced in the `_juddiv3.xml` file.

Property Name	Description	Required	Default Value or [Example Value]
<i>juddi/validation/enforceReferentialIntegrity</i>	As of 3.1.5 This setting will force referential integrity for all tModels (except	N	[true]

Deploying

two

or

Property Name	Description	Required	Default Value or [Example Value]
	keyGenerators), category bags, bindingTemplate/ AccessPoint/ hostingRedirector (referencing	server on the same application server	
	another host), tModellInstanceParms and anything else that references a KeyName default value is true. Set to false for backwards compatibility or for a more lax registry.		

5.10. Deploying two or more jUDDI server on the same application server

It is possible to deploy one or more jUDDI servers to the same application server. You will need copy the `juddiv3.war` archive (let's say you copied it to `juddiv3a.war`), and change the following settings to have it connect to a different database:

1. edit the `juddiv3a/META-INF/context.xml` (and `conf/Catalina/localhost/juddiv3a.xml`) to use the `jdbc/JuddiADS` datasource, and add a to the url: `url="jdbc:derby:target/juddi-derby-test-db-v3a;create=true"`
2. edit the `juddiv3a/WEB-INF/classes/META-INF/persistence.xml` to use `<non-jta-data-source>java:comp/env/jdbc/JuddiADS` and `persistence-unit name="juddiADatabase"`
3. edit the `juddiv3a/WEB-INF/classes/juddiv3.xml` to have `<persistenceunit><name>juddiADatabase</name></persistenceunit>`

This will create a new jUDDI server under the `http://localhost:8080/juddiv3a` url which connects to the `juddi-derby-test-db-v3a` Derby database.

5.11. jUDDI GUI Configuration

The jUDDI GUI (`juddi-gui.war`) has one place for configuration settings, the jUDDI Client config file.

5.12. jUDDI Client uddi.xml Settings

Defined in WEB-INF/classes/META-INF/uddi.xml, there are many settings to configure. All of these are clearly defined by the jUDDI Client Configuration Guide. The juddi-gui, uses things a bit differently, so here are the relevant parts to use. Note: this is xpath notation.

- uddi/client/nodes/properties, not used
- uddi/client/clerks, not used
- uddi/client/nodes/node, all URLs except juddiApiUrl (not used)
- uddi/client/signature, all validation related settings
- uddi/client/subscriptionCallbacks, not used
- uddi/client/XtoWsdI, not used

In addition, there a special section added just for the juddi-gui.war

Table 5.9. jUDDI GUI Configuration

Property Name	Description	Required	Default Value or [Example Value]
<i>uddi/config/props/authtype</i>	This controls the authentication mode to connect to a UDDI server. Most implementations of UDDI use the security service, however others use HTTP based authentication. In this case, us the value of <i>HTTP</i> , otherwise <i>UDDI_AUTH</i>	Y	<i>UDDI_AUTH</i>
<i>uddi/config/props/enableAutomaticLogouts</i>	This flag determines whether automatic logouts is enabled. By default, jUDDI-gui sets this to false for ease of use. (true/false)	N	<i>false</i>
<i>uddi/config/props/enableAutomaticLogoutsduration</i>	Time in milliseconds to force an automatic logout after inactivity.	N	<i>900000</i>

Encryption Keys

Property Name	Description	Required	Default Value or [Example Value]
<i>uddi/config/props/configLocalHostOnly</i>	If false, the configuration page will be available from anywhere. If true, it will only be accessible from the server hosting juddi-gui. (true/false)	N	<i>true</i>

5.13. Encryption Keys

By default, the juddi-gui will use a randomly generated AES encryption key to help protect user credentials stored in the session object. This key is generated using the "StartupServlet" defined in the web.xml file of juddi-gui.war/WEB-INF/web.xml and then it is stored at the path juddi-gui.war/META-INF/config.properties@key.

If the start up servlet fails to start, any authenticate operation of the juddi-gui will fail.



Important

The user account that the container for juddi-gui runs as must have write access to the file juddi-gui.war/META-INF/config.properties.

5.14. Customizing the juddi-gui

The juddi-gui has a mechanism that you can use to alter the appearance of every page. This is typically used for organizations that require legal notifications, banners or warnings on every page for one reason or another. To add your own html to every page, edit the file in

```
juddi-gui/user/banner.jsp
```

Chapter 6. UDDI Seed Data

This information is relevant for both understanding how jUDDI's default data is set when jUDDI first runs (i.e. to a new database). It's also useful for scripting or automating the deployment of a jUDDI server within your organization which will enable you to prepopulate the data.

As of UDDI v3, each registry need to have a "root" publisher. The root publisher is the owner of the UDDI services (inquiry, publication, etc). There can only be one root publisher per node. JUDDI ships some default seed data for the root account. The default data can be found in the juddi-core-3.x.jar, under juddi_install_data/. By default jUDDI installs two Publishers: "root" and "uddi". Root owns the root partition, and uddi owns all the other seed data such as pre-defined tModels.

6.1. Seed Data Files

For each publisher there are four seed data files that will be read the first time you start jUDDI:

```
<publisher>_Publisher.xml
<publisher>_tModelKeyGen.xml
<publisher>_BusinessEntity.xml
<publisher>_tModels.xml
```

For example the content of the root_Publisher.xml looks like

```
<publisher xmlns="urn:juddi-apache-org:api_v3" authorizedName="root">
  <publisherName>root publisher</publisherName>
  <isAdmin>true</isAdmin>
</publisher>
```

Each publisher should have its own key generator schema so that custom generated keys cannot end up being identical to keys generated by other publishers. It is therefor that the each publisher need to define their own KenGenerator tModel. The tModel Key Generator is defined in the file root_tModelKeyGen.xml and the content of this file is

```
<tModel tModelKey="uddi:juddi.apache.org:keygenerator" xmlns="urn:uddi-
org:api_v3">
  <name>uddi-org:keyGenerator</name>
  <description>Root domain key generator</description>
  <overviewDoc>
    <overviewURL useType="text">
      http://uddi.org/pubs/uddi_v3.htm#keyGen
    </overviewurl>
  </overviewdoc>
  <categoryBag>
    <keyedReference tModelKey="uddi:uddi.org:categorization:types"
      keyName="uddi-org:types:keyGenerator"
```

Seed
Data
Files

```
        keyValue="keyGenerator" />
    </categorybag>
</tmodel>
```

This means that the legal format of keys used by the root publisher need to be in the form `uddi:juddi.apache.org:<text-of-choice></text-of-choice>` The use of other types of format will lead to an *illegal key* error. The root publisher can only own one KeyGenerator while any other publisher can own more than one KeyGenerator. KeyGenerators should not be shared unless there is a good reason to do so. If you want to see your publisher with more than just the one KeyGenerator tModel, you can use the `<publisher></publisher>_tModels.xml` file. Finally, in the `<publisher></publisher>_BusinessEntity.xml` file can be used to setup Business and Service data. In the `root_BusinessEntity.xml` we specified the ASF Business, and the UDDI services; Inquiry, Publish, etc.:

```
<businessEntity xmlns="urn:uddi-org:api_v3" xmlns:xml="http://www.w3.org/
XML/1998/namespace" businessKey="uddi:juddi.apache.org:businesses-asf">
  <!-- Change the name field to represent the name of your registry -->
  <name xml:lang="en">An Apache jUDDI Node</name>
  <!-- Change the description field to provided a brief description of your
registry -->
  <description xml:lang="en">This is a UDDI v3 registry node as implemented
by Apache jUDDI.</description>
  <discoveryURLs>
    <!-- This discovery URL should point to the home installation URL of
jUDDI -->
    <discoveryURL useType="home">${juddi.server.baseurl}/juddiv3</
discoveryURL>
  </discoveryURLs>
  <categoryBag>
    <keyedReference tModelKey="uddi:uddi.org:categorization:nodes"
keyValue="node" />
  </categoryBag>
  <businessServices>
    <!-- As mentioned above, you may want to provide user-defined keys for
these (and the services/bindingTemplates below. Services that you
don't intend to support should be removed entirely -->
    <businessService serviceKey="uddi:juddi.apache.org:services-inquiry"
businessKey="uddi:juddi.apache.org:businesses-asf">
      <name xml:lang="en">UDDI Inquiry Service</name>
      <description xml:lang="en">Web Service supporting UDDI Inquiry API</
description>
      <bindingTemplates>
        <bindingTemplate bindingKey="uddi:juddi.apache.org:servicebindings-
inquiry-ws" serviceKey="uddi:juddi.apache.org:services-inquiry">
          <description>UDDI Inquiry API V3</description>
          <!-- This should be changed to the WSDL URL of the inquiry API.
An access point inside a bindingTemplate will be found for every service
in this file. They all must point to their API's WSDL URL -->
```

Tokens

in
the

```
<accessPoint useType="wsdlDeployment">${juddi.server.baseurl}/
services/inquiry?wsdl</accessPoint>
  <tModelInstanceDetails>
    <tModelInstanceInfo tModelKey="uddi:uddi.org:v3_inquiry">
      <instanceDetails>
        <instanceParms>
          <![CDATA[
            <?xml version="1.0" encoding="utf-8" ?>
            <UDDIinstanceParmsContainer xmlns="urn:uddi-
org:policy_v3_instanceParms">
              <defaultSortOrder>
                uddi:uddi.org:sortorder:binarysort
              </defaultSortOrder>
            </UDDIinstanceParmsContainer>
          ]]>
        </instanceParms>
      </instanceDetails>
    </tModelInstanceInfo>
  </tModelInstanceDetails>
  <categoryBag>
    <keyedReference keyName="uddi-org:types:wsdl"
keyValue="wsdlDeployment" tModelKey="uddi:uddi.org:categorization:types"/>
  </categoryBag>
</bindingTemplate>
</bindingTemplates>
</businessService>
<!-- snip -->
</businessService>
```

Note that the seeding process only kicks off if no publishers exist in the database. So this will only work with a clean database, unless you set `juddi/seed/always` to true. Then it will re-apply all files with the exception of the root data files. Note that this can lead to losing data that was added to entities that are re-seeded, since data is not merged.

6.2. Tokens in the Seed Data

You may have noticed the tokens in the `root_BusinessEntity.xml` file (`${juddi.server.baseurl}`). The value of this tokens can set in the `juddiv3.xml` file. The value substitution takes place at runtime, so that different nodes can do the substitution with their own value if needed.

6.3. Customer Seed Data

In your deployment you probably do not want to use the Seed Data shipped with the default jUDDI install. The easiest way to overwrite this data is to add it to a directory call `juddi_custom_install_data` in the `juddiv3.war/WEB-INF/classes/` directory. That way you don't have to modify the `juddi-core-3.x.jar`. Additionally if your root publisher is not called "root" you will need to set the `juddi/root/publisher` property in the `juddiv3.xml` file to something other than

Customer
Seed
Data

```
juddi/root/publisher=root
```

The juddiv3.war ships with two example data directory. One for the Sales Affiliate, and one for the Marketing Affiliate. To use the Sales Seed Data, in the juddiv3.war/WEB-INF/classes/, rename the directory

```
*nix  
mv RENAME4Sales_juddi_custom_install_data juddi_custom_install_data  
Win*  
ren RENAME4Sales_juddi_custom_install_data juddi_custom_install_data
```

before you start jUDDI the first time. It will then use this data to populate the database. If you want to rerun you can trash the database it created and restart tomcat. Don't forget to set the tokens in the juddiv3.xml file.

Chapter 7. How to deploy jUDDI To?

The jUDDI distribution ships preconfigured on Tomcat - it runs out of the box. All you have to do in go into the `juddi-distro-<version>/juddi-tomcat-<version>/bin` directory and start up Tomcat. All of this just as described in Chapter 2, *Getting Started*.

By default the `juddiv3.war` is configured to use OpenJPA and CXF. If you want to change your JPA or WS provider, or you'd like to run on a different container then this chapter may come in handy, as there a number of scripted *profiles* to change the configuration and dependencies in the `juddiv3.war`. To run these maven based scripts you need to go into `juddi-distro-<version>/juddiv3-war` directory.

7.1. Tomcat

7.1.1. OpenJPA and CXF

Target platform Tomcat and Derby using OpenJPA and CXF. Both OpenJPA and CXF are packaged up in the `juddiv3.war`.

```
mvn clean package -P openjpa
```

Then copy the `target/juddiv3.war` to the `<tomcat>/webapps` directory.

7.1.2. Hibernate and CXF

Target platform Tomcat and Derby using Hibernate and CXF. Both Hibernate and CXF are packaged up in the `juddiv3.war`.

```
mvn clean package -P hibernate
```

Then copy the `target/juddiv3.war` to the `<tomcat>/webapps` directory.

7.1.3. OpenJPA and Axis2

Target platform Tomcat and Derby using OpenJPA and Apache Axis2. Both Hibernate and Axis2 are packaged up in the `juddiv3.war`.

```
mvn clean package -P axis2
```

Then copy the `target/juddiv3.war` to the `<tomcat>/webapps` directory.

7.2. JBoss

7.2.1. JBossAS 6.0.0.GA

This section describes how to deploy juddi to JBoss 6.0.0.GA.

First, download jboss-6.0.0.GA - the zip or tar.gz bundle may be found at <http://www.jboss.org/jbossas/downloads/>. Download the bundle and uncompress it.

7.2.1.1. Hibernate and JBossWS-Native

Target platform JBoss-6.x and HSQL using Hibernate and JBossWS-native. The juddiv3.war relies on Hibernate and JBossWS-native in the appserver.

```
mvn clean package -P hibernate-jbossws-native
```

Then copy the `target/juddiv3.war` to the `<jboss>/server/default/deploy` directory.

7.2.1.2. Hibernate and JBossWS-CXF

Target platform JBoss-6.x and HSQL using Hibernate and JBossWS-cxf. The juddiv3.war relies on Hibernate and JBossWS-cxf in the appserver.

```
mvn clean package -P hibernate-jbossws-cxf
```

KNOWN ISSUES

Issue 1

```
15:14:37,275 SEVERE [RegistryServlet] jUDDI registry could not be
started. org.apache.commons.configuration.ConfigurationException:
java.util.zip.ZipException: error in opening zip file:
org.apache.commons.configuration.ConfigurationException:
org.apache.commons.configuration.ConfigurationException:
java.util.zip.ZipException: error in opening zip file
```

Workaround: deploy juddiv3.war as a directory (not a zip file).

Issue 2

JBoss-5.x Note that configuration 3 and 4 will also run on JBoss-5.x, but you may run into the following

```
ERROR [org.jboss.ws.metadata.wsdl.xmlschema.JBossXSErrHandler]
(main) [domain:http://www.w3.org/TR/xml-schema-1]::[key=src-
resolve]::Message=src-resolve: Cannot resolve the name ns1:Signature to a
element declaration component.
```

Workaround: Unzip the `deployers/jbossws.deployer/jbossws-native-core.jar` and add the `xmldsig-core-schema.xsd` in the schema directory,

```
10293 Fri May 27 14:40:40 EDT 2011 schema/xmldsig-core-schema.xsd
```

Edit the file `META-INF/jbossws-entities.properties` by adding a line at the bottom saying:

```
http\://www.w3.org/2000/09/xmldsig#schema/xmldsig-core-schema.xsd
```

Copy `juddiv3.war` to `server/default/deploy` and unpack it.

Insert `jboss-web.xml` into the `juddiv3.war/WEB-INF` directory, should look like the following :

```
<?xml version="1.0" encoding="ISO-8859-1"?>

<!DOCTYPE jboss-web PUBLIC
"-//JBoss//DTD Web Application 2.3V2//EN"
"http://www.jboss.org/j2ee/dtd/jboss-web_3_2.dtd">

<jboss-web>

  <resource-ref>
    <res-ref-name>jdbc/JuddiDS</res-ref-name>
    <jndi-name>java:JuddiDS</jndi-name>
  </resource-ref>
  <depends>jboss.jdbc:datasource=JuddiDS,service=metadata</depends>

</jboss-web>
```

7.2.1.3. Change web.xml

Replace the `WEB-INF/web.xml` with the `jbossws-native-web.xml` within `docs/examples/appserver`.

7.2.1.4. Configure Datasource

The first step for configuring a datasource is to copy your JDBC driver into the classpath. Copy your JDBC driver into `${jboss.home.dir}/server/${configuration}/lib`, where `configuration` is the profile you wish to start with (default, all, etc.). Example :

```
cp mysql-connector-java-5.0.8-bin.jar /opt/jboss-5.1.0.GA/server/default/lib
```

Next, configure a JBoss datasource file for your db. Listed below is an example datasource for MySQL :

```
<?xml version="1.0" encoding="UTF-8"?>
<datasources>
  <local-tx-datasource>
    <jndi-name>JuddiDS</jndi-name>
```

JBossAS 7.x/ JBossEAP-6.x

```
<connection-url>jdbc:mysql://localhost:3306/juddiv3</connection-url>
<driver-class>com.mysql.jdbc.Driver</driver-class>
<user-name>root</user-name>
<password></password>
<exception-sorter-class-
name>org.jboss.resource.adapter.jdbc.vendor.MySQLExceptionSorter</exception-
sorter-class-name>

<!-- corresponding type-mapping in the standardjbosscomp-jdbc.xml
(optional) -->
<metadata>
  <type-mapping>mysql</type-mapping>
</metadata>
</local-tx-datasource>
</datasources>
```

Next, make a few changes to the `juddiv3.war/classes/META-INF/persistence.xml`. Change the "hibernate.dialect" property to match the database you have chosen for persistence. For MySQL, change the value of `hibernate.dialect` to "org.hibernate.dialect.MySQLDialect". A full list of dialects available can be found in the hibernate documentation (https://www.hibernate.org/hib_docs/v3/api/org/hibernate/dialect/package-summary.html). Next, change the `<jta-data-source>` tags so that it reads `<non-jta-data-source>`, and change the value from `java:comp/env/jdbc/JuddiDS` to `java:/JuddiDS`.

7.2.2. JBossAS 7.x/JBossEAP-6.x

This section describes how to deploy juddi to JBossAS 7, WildFly and JBossEAP 6

7.2.2.1. Hibernate and JBossWS-CXF

This profile is not yet scripted as there is an issue with Hibernate, see JUDDI-587.

7.2.2.2. OpenJPA and JBossWS-CXF

Target platform using HSQL using OpenJPA and JBossWS-CXF. The `juddiv3.war` relies on the `openjpa` and `cxf` modules in the appserver.

```
mvn clean package -P openjpa-jboss7up
```

Then copy the `target/juddiv3.war` to the `<jboss>/standalone/deployments` directory.

Not all the JBoss appservers mentioned above shipped a module for `openjpa`. If it did not then you can create it:

In your appserver create the following directory structure `<jboss>/modules/system/layers/base/org/apache/openjpa/main` and the following files:

```
module.xml  openjpa-2.2.1.jar  serp-1.13.1.jar
```


JBossAS
7.x/
JBossEAP-6.x

where the contents of the modules.xml should look like

```
<module xmlns="urn:jboss:module:1.1" name="org.apache.openjpa">
  <resources>
    <resource-root path="openjpa-2.2.1.jar"/>
    <resource-root path="serp-1.13.1.jar"/>
  </resources>
  <dependencies>
    <module name="javax.persistence.api"/>
    <module name="javax.transaction.api"/>
    <module name="javax.validation.api"/>
    <module name="org.apache.commons.lang"/>
    <module name="org.apache.commons.collections"/>
    <module name="org.apache.log4j"/>
  </dependencies>
</module>
```

Next create the directory structure `<jboss>/modules/system/layers/base/org/jboss/as/jpa/openjpa/main` with the files:

```
jboss-as-jpa-openjpa-7.1.1.Final.jar module.xml
```

where the contents of the modules.xml should look like

```
<?xml version="1.0" encoding="UTF-8"?>
<!-- contains the JPA integration classes for OpenJPA 2.x -->
<module xmlns="urn:jboss:module:1.1" name="org.jboss.as.jpa.openjpa">
  <properties>
    <property name="jboss.api" value="private"/>
  </properties>

  <resources>
    <resource-root path="jboss-as-jpa-openjpa-7.1.1.Final.jar"/>
    <!-- Insert resources here -->
  </resources>

  <dependencies>
    <module name="javax.annotation.api"/>
    <module name="javax.persistence.api"/>
    <module name="javax.transaction.api"/>

    <module name="org.jboss.as.jpa.spi"/>
    <module name="org.jboss.logging"/>
    <module name="org.jboss.jandex"/>

    <module name="org.apache.openjpa" optional="true"/> <!--
org.apache.openjpa:main must be created manually with OpenJPA jars -->
  </dependencies>
```

Deploying to Glassfish

```
</module>
```

and in the `modules/system/layers/base/org/jboss/as/jpa/main/module.xml` add dependency

```
<module name="org.jboss.as.jpa.openjpa"/>
```

7.3. Deploying to Glassfish

This section describes how to deploy juddi to Glassfish 2.1.1. These instructions will use CXF as a webservice framework.

First, download the glassfish-v2.1.1 installer JAR. Once downloaded, install using the JAR and then run the ant setup script :

```
java -jar glassfish-installer-v2.1.1-b31g-linux.jar  
cd glassfish  
ant -f setup.xml
```

7.3.1. Glassfish jars

Copy the following JARs into domains/domain1/lib/ext. Note that for the purposes of this example, we have copied the MySQL driver to domains/domain1/lib/ext :

```
antlr-2.7.6.jar  
cglib-nodep-2.1_3.jar  
commons-collections-3.2.1.jar  
commons-logging-1.1.jar  
dom4j-1.6.1.jar  
hibernate-3.2.5.ga.jar  
hibernate-annotations-3.3.0.ga.jar  
hibernate-commons-annotations-3.0.0.ga.jar  
hibernate-entitymanager-3.3.1.ga.jar  
hibernate-validator-3.0.0.ga.jar  
javassist-3.3.ga.jar  
jboss-common-core-2.0.4.GA.jar  
jta-1.0.1B.jar  
mysql-connector-java-5.0.8-bin.jar  
persistence-api-1.0.jar
```

7.3.2. Configure the JUDDI datasource

First, using the asadmin administration tool, import the following file :

```
<?xml version="1.0" encoding="UTF-8"?>  
<!DOCTYPE resources PUBLIC "-//Sun Microsystems Inc.//DTD Application Server  
9.0 Domain//EN" "*<install directory>/lib/dtds/sun-resources_1_3.dtd*">  
<resources>
```

Add juddiv3- cdf.war

```
<jdbc-connection-pool name="mysql-pool" datasource-  
class="com.mysql.jdbc.jdbc2.optional.MysqlDataSource" res-  
type="javax.sql.DataSource">  
<property name="user" value="juddi"/>  
<property name="password" value="juddi"/>  
<property name="url" value="jdbc:mysql://localhost:3306/juddiv3"/>  
</jdbc-connection-pool>  
<jdbc-resource enabled="true" jndi-name="jdbc/mysql-resource" object-  
type="user" pool-name="mysql-pool"/>  
</resources>
```

```
asadmin add-resources resource.xml
```

Then use the Glassfish administration console to create a "jdbc/juddiDB" JDBC datasource resource based on the mysql-pool Connection Pool.

7.3.3. Add juddiv3-cdf.war

Unzip the juddiv3-cdf WAR into domains/domain1/autodeploy/juddiv3.war .

Add a sun-web.xml file into juddiv3.war/WEB-INF. Make sure that the JNDI references matches the JNDI location you configured in the Glassfish administration console.

```
<?xml version="1.0" encoding="UTF-8"?>  
<!DOCTYPE sun-web-app PUBLIC "-//Sun Microsystems, Inc.//DTD  
Application Server 9.0 Servlet 2.5//EN"  
'http://www.sun.com/software/appserver/dtds/sun-web-app_2_5-0.dtd'  
<sun-web-app>  
<resource-ref>  
<res-ref-name>jdbc/juddiDB</res-ref-name>  
<jndi-name>jdbc/juddiDB</jndi-name>  
</resource-ref>  
</sun-web-app>
```

Next, make a few changes to juddiv3.war/WEB-INF/classes/META-INF/persistence.xml . Change the "hibernate.dialect" property to match the database that you have chosen for persistence. For MySQL, change the value of hibernate.dialect to "org.hibernate.dialect.MySQLDialect". A full list of dialects available can be found in the hibernate documentation (https://www.hibernate.org/hib_docs/v3/api/org/hibernate/dialect/package-summary.html). Next, change the <jta-data-source> change the value from java:comp/env/jdbc/JuddiDS to java:comp/env/jdbc/JuddiDB.

7.3.4. Run JUDDI

Start up the server :

```
cd bin
```

Run
jUDDI

```
asadmin start-domain domain1
```

Once the server is deployed, browse to <http://localhost:8080/juddiv3>

Chapter 8. Extending UDDI

jUDDI has extensively uses the Interface/Factory pattern to enable configuration runtime options and to provide you, the developer easy insertion points to customize the behavior of jUDDI. The remaining sections of this chapter outline the different technology insertion points.

8.1. Authentication modules

Authentication modules are used when the UDDI's AuthToken is utilized on the Security web service. It's function is to point to some kind of user credential store to validate users. See the User Guide for details on what's available out of the box.

All of the provided classes implement the interface `.org.apache.juddi.v3.auth.Authenticator..` So, if you wanted something a bit more functional than what's provided out of the box. you'll need to implement your own Authenticator. To wire it in, edit the `juddiv3.xml` file, specifying your class name as the value to the property `"juddi/auth/authenticator/class"` and then add the class or jar containing your implementation to `juddiv3.war/WEB-INF/classes` or `jdiv3.war/WEB-INF/lib` respectively.

8.2. Subscription Notification Handlers

Subscription Notification Handlers are used to asynchronously notify users that something has changed in UDDI. In order to do this, a UDDI Subscription is created that references a specific Binding Template key which represents the service that will be called whens something changes. jUDDI comes with support for Email delivery and the UDDI Subscription Listener Web Service (HTTP) delivery. In addition, jUDDI comes with an example for publishing to an Apache Qpid AMQP pub/sub server, which can be used to further disseminate the change. The following is an exert from the jUDDI Blog posting on this.

1. Make a new Java library projects in your IDE of choice. Reference the `juddi-core`, and `uddi-ws` projects or JAR files or the Maven dependency equivalent
2. Create a class of your own within the following package name:
`org.apache.juddi.subscription.notify`
3. The class name MUST follow this pattern: `PROTOCOLNotifier` Where `PROTOCOL` is the prefix of whatever URL you want users to be able to use. Here's an example using Apache Qpid. Example URL: `amqp://guest:guest@client1/development?brokerlist=tcp://localhost:5672` Class Name: `AMQPNotifier`. The Notification class basically takes the protocol of the Access Point's value, splits it on the character `":"` and then grabs the first token `"amqp"` and converts to upper case. Using this pattern you should be able to insert anything you want.
4. Our new shinny class, `AMQPNotifier`, must implement the interface `org.apache.juddi.subscription.notify.Notifier`. From there, all you need to do is to add in the jars necessary for your transport mechanism and wire in your own code.

KeyedReference

Value

Set

5. Deployment is simple. Add your PROTOCOLNotifier jar and its dependencies to the juddiv3.war/WEB-INF/lib folder.

Validation
Services

Note: be careful and watch for conflicting jar file versions. In general, usually moving up a version is ok, but moving down may cause the services to fail unexpectedly.

To test, create a Service with the BindingTemplate's Access Point's value equal to whatever you need. Next, setup a subscription and reference the BindingTemplate key that represents your call back handler's end point. Finally, change an item that is covered by the subscription's filter and monitor the log files. Hopefully, you won't see an unexpected errors.

8.3. KeyedReference Value Set Validation Services

Reserved for future discussion for jUDDI v3.3

8.4. Cryptographic Providers

jUDDI provides cryptographic functions via (Java) juddi-client.jar/org.apache.juddi.v3.client.cryptor and implement the Cryptor interface which provides two simple functions, encrypt and decrypt. (Note: .NET has similar functionality).

8.5. jUDDI Client Transport

The juddi-client's Transport class is an abstract class that you can you alter the transport mechanism used by jUDDI's client APIs. Included is what would be used in most cases, such as JAXWS, RMI, and InVM (Embedded mode). This can be extended to use whatever you may need.

Chapter 9. Digital Signatures

Users of UDDI can use digital signatures to ensure that no unauthorized users alter the content of UDDI. We're sure that one of the first questions one would ask is "can't access control rules handle this problem for us?" The answer is yes, however it does not mitigate the risk of a number of opportunities for electronic attack.

9.1. Requirements

UDDI supports both the XML Digital Signature specification, which effectively means that you can use PGP Keys and X509 certificates. jUDDI provides out of the box support for X509 certificates and the Public Key Infrastructure (PKI). If you require direct PGP signing support, please open a JIRA ticket.

9.2. Using Digital Signatures using the jUDDI GUI

Please see ???.

9.3. Frequently Asked Questions

Doesn't UDDI access control rules prevent alteration of the content?

Yes, however it does not mitigate the man in the middle attack vectors. Since UDDI is used to determine the location of the thing you want, it's possible that falsified endpoints can be interjected in transport. The target service requires authentication, then the end user's credentials could be compromised without their knowledge.

How can I sign a business, service, tModel or binding?

Use the juddi-gui's digital signature applet by first located the item in the juddi-gui interface, then click on the "Sign" button. You need write access to the entity.

The digital signature applet doesn't run. Now what?

The applet requires the Java browser plugin. Unfortunately, due to recent (2013) security vulnerabilities, many places of business have heeded Oracle's advice and have disabled the browser plugin. There are other options, however.

What other tools can I use to sign a UDDI entity?

TBD

What is a signature?

It's basically a cryptographic (a fancy math equation) using a set a keys (one is public and everyone can see/know it, the other only is held by the owner) that proves that the owner signed a piece of data.

How is a signature verified?

There's a few ways, we can prove mathematically that the signature is valid (the content hasn't been modified). From there we can also verify that the signing key is valid.

Frequently
Asked
Questions

How do we know the signing key is valid?

Most certificates (key pairs) have some kind of mechanism in it to verify if the certificate has been revoked. If your certificate has it, it will be labeled with something like OCSP or CRL. Both of these are supported in both .NET and Java juddi-clients as well as via the juddi-gui.

Chapter 10. Troubleshooting jUDDI

Here are some tips to help you troubleshoot problems with jUDDI, jUDDI-GUI, jUDDI Client and more.

10.1. jUDDI Web Services, juddiv3.war

10.1.1. Enable debugging logging

You can adjust the logging level to provide additional output for troubleshooting purposes. To do so, see the Administration Guide, Logging.

10.2. jUDDI GUI, juddi-gui.war

Problem: Can't authentication from juddi-gui's top right hand side login box to juddiv3.war services
Solutions:

- Check the server's log files for both juddi, juddi-gui and the server itself for error messages. This can sometimes be caused by the lack of Java Crypto Extensions (Oracle/Sun JRE/JDK only).
- Check juddi-gui's configuration page at <http://localhost:8080/juddi-gui/settings.jsp>, confirm that the URL's that are referenced for the UDDI services are correct and accessible from the server hosting juddi-gui.
- Make sure you're using a valid username/password ;)
- Increase the logging level of jUDDI by changing the commons-logging.properties file
- If you're having problems with Email delivery of subscription updates, enable debug logging by setting `config/uddi/mail/debug=true` in `juddiv3.xml`

10.3. jUDDI Client Java

10.3.1. Enable debugging logging

You can adjust the logging level to provide additional output for troubleshooting purposes. To do so, see the Administration Guide, Logging.

10.4. jUDDI Client .NET

Components based on jUDDI's Client for the .NET Framework can configure logging from their application's config file. This is usually `app.config` or `web.config`. To configure logging, the following three settings must appear in the `configuration/appSettings` section.

```
<!-- DEBUG, INFO, WARN, ERROR -->
```

Getting help

```
<add key="org.apache.juddi.v3.client.log.level" value="INFO" />
  <!-- options are CONSOLE, EVENTLOG, FILE multiple values can be
specified, comma delimited.
Notes for EVENTLOG, you must run the juddi-installer as admin before
running-->
  <add key="org.apache.juddi.v3.client.log.target" value="CONSOLE" />
<!-- only used when target=FILE -->
  <add key="org.apache.juddi.v3.client.log.logger.file"
value="pathToOutputFile" />
```

If nothing is defined, the default log level is "WARN" and the target is "CONSOLE" which is standard out.

10.5. Getting help

There are many different ways to get help with your jUDDI instance. Please refer to the following URLs for more information.

- jUDDI Home Page <http://juddi.apache.org/>
- User Guide <http://juddi.apache.org/docs/3.x/userguide/html/index.html#navbar.help.userguide>
- Developer Guide <http://juddi.apache.org/docs/3.x/devguide/html/index.html#navbar.help.devguide>
- Developer API Documentation <http://juddi.apache.org/docs.html>
- jUDDI Wiki <http://wiki.apache.org/juddi>
- jUDDI Issue/Bug Tracker <http://juddi.apache.org/issue-tracking.html>
- jUDDI User and Developer Mailing List <http://juddi.apache.org/mailling-list.html>
- jUDDI Source Code <http://svn.apache.org/viewvc/juddi/>

Chapter 11. Contributing to jUDDI

We welcome contributions to jUDDI. Visit the jUDDI web set at <http://juddi.apache.org> for more information.

11.1. License guidance

Apache jUDDI is released under the Apache Software Foundation v2.0 License. Details on the license is located at the following link: <http://apache.org/licenses/LICENSE-2.0>.

If you wish to bring in 3rd libraries, please keep in mind that certain libraries cannot be used due to license restrictions. See <http://www.apache.org/legal/3party.html> for details.

11.2. SVN access

Source code is accessible at the following link: <https://svn.apache.org/viewvc/juddi/trunk/>.

11.3. Project structure

jUDDI, from a developer's perspective, is divided into a number of smaller, more manageable modules. In general, each module contains all of the necessary unit tests in order to ensure functionality.

11.4. Building and testing jUDDI

jUDDI has a number of components, however it is mostly Java based. The following sections describe the particulars for each language.

11.4.1. All Java Components

Procedure

1. Acquire a Subversion client.
2. Execute `svn co https://svn.apache.org/viewvc/juddi/trunk/`
3. Acquire a JDK5 or higher and setup the `JAVA_HOME` environment variable.
4. Acquire Apache Maven. Known working version: 3.0.4
5. Setup an environment variable, `MAVEN_OPTS=-Xmx768m -XX:MaxPermSize=512m`
6. Make sure the Maven/bin folder and the JDK/bin folders are in the current path
7. Execute "mvn clean install"

This will build, test and package all of the Java components of jUDDI. This includes the Technical Conformance Kit (TCK), a live Tomcat server, the user interfaces, and more.

For additional build output, add `-Ddebug=true` for Java.

To prepare a deployable jUDDI war for an alternate deployment scenario (other than Tomcat with CXF and OpenJPA), use the following procedure:

1. Execute `"mvn clean package -P<packageName>"`

Where `<packageName>` is one of the following

1. `openjpa-jboss7up` for EAP 6 and up, GA 7 and up
2. `hibernate-jbossws-native` for EAP 5, Jboss GA 6 and down with the JbossWS Native soap stack
3. `hibernate-jbossws-cxf` for EAP 5, Jboss GA 6 and down with the JbossWS Native soap stack
4. `hibernate` (includes CXF in the war, used for Tomcat)
5. `openjpa` (includes CXF in the war, used for Tomcat)
6. `axis2` (includes Axis2 in the war)



Tip

When altering the TCK based modules, make sure you clean install in the root check out location. Due to the build order, you may end up with strange results when just executing the tests, even with clean install.



Tip

To attach the debugger to the build process try `"mvn -Dmaven.surefire.debug clean install"`. It listens on port 5005 by default. More info on debugging maven projects is here <http://maven.apache.org/surefire/maven-surefire-plugin/examples/debugging.html>

11.4.2. .NET

jUDDI also has a .NET based jUDDI Client. To build this, only the .NET Framework needs to be installed, version 3.5 or higher. A Visual Studio solution file is included, but it is not required for building.

Procedure - Windows * Add MSBuild.exe to your system path. It's usually in `%SYSTEMROOT%\Microsoft.NET\Framework(64)\v4.x.x`. If you haven't installed .NET 4 yet, replace `v4.x.x` with

Other
ways

to
Contribute
to
jUDDI

v2.x.x * Build the solution. This will build the `juddi-client.net.dll`, the same application(s) and the test project(s).

```
MSBuild.exe juddi-client.net.sln /p:Configuration=Debug /p:Platform="Any  
CPU"
```

For additional debug output set the environment variable `debug=true`

```
set debug=true
```

Procedure - *nix using Mono



Tip

Support on Mono is very experimental. There are still many APIs that have no yet been implements on Mono that may cause compilation failure.

To build the .NET assemblies on a Linux or Unix based computer: * Install Mono (`apt-get install mono-complete mono-develop` * Build it

```
cd juddi-client.net  
xbuild juddi-client.net-mono.sln  
cd juddi-client.net-sample/bin/Debug/  
mono juddi-client.net-sample.exe
```

11.5. Other ways to Contribute to jUDDI

There are many ways you can contribute to jUDDI. We welcome all kinds and types contributions.

11.5.1. Bug Reports

Bug reports and feature requests are low effort tasks that do not require a high level of technical proficiency.

11.5.2. Internationalization

The jUDDI GUI user interface is designed to be multi-lingual. For the 3.2 release, English and Spanish are provided for the user interface. The jUDDI server administration user interface is also available in English and Spanish.

11.5.3. Contributing Source code

When contributing source code, you must own the code and be will to donate the code to the Apache Software Foundation. For those without SVN access, the process is as follows: . Open a

JIRA on the jUDDI Issue Tracker . Write your code and test it (mvn clean install) . Use Subversion to create a patch (svn patch) . Upload the patch as an attachment for the JIRA

Once accepted, your code will be added to the baseline. Code submissions may be modified for style, content, documentation and any other reason that we see fit.

11.5.3.1. Coding Standards

The majority of jUDDI's source code is formatted using 8 space tabs and using Javadoc style documentation. In general, test cases are often more useful and more valuable than the code being tested.

11.5.4. Releases

For the latest information on jUDDI's release process, visit <http://juddi.apache.org/committers.html>

11.6. What the?

Having ran into a number of strange issues when developing with jUDDI, we decided to write a few of them down.

1. I added a new class to juddi-core but it doesn't end up in the packaged tomcat instance? A: Modify the pom and make sure the package name is added to juddi-core-openjpa
2. Some unit tests fail, but only under windows. A: This is specifically for the SubscriptionListerner Tests and most likely has something to do with ports getting locked up by the Java process.

Bibliography

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