JBoss ESB 4.2 Milestone Release 3

Registry Service

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JBoss ESB 4.2 Milestone Release 3

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# Contents

## Table of Contents

Contents..................................................... iv

About This Guide.............................................. 5

What This Guide Contains......................... 5
Audience.......................................................... 5
Prerequisites.................................................. 5
Organization.................................................... 5
Documentation Conventions.......................... 5
Additional Documentation............................. 7
Contacting Us............................................... 7

What is the Registry?........................................ 9

Introduction................................................. 9
Why do I need it?.......................................... 9
How do I use it?.......................................... 9
Registry Vs Repository................................. 9
SOA components.......................................... 9
UDDI............................................................... 10

Configuring the Registry............................... 11

Introduction................................................. 11
The components involved.............................. 12
The Registry Implementation Class.................. 12
Using JAXR.................................................. 13
Using Scout and jUDDI................................. 13

Chapter 2.................................................. 15

Configuration Examples............................... 15

Introduction................................................. 15
Embedded................................................... 15
RMI using the juddi.war or jbossesb.sar........ 16
RMI using your own JNDI Registration of the
  RMI Service............................................. 17
2.4 SOAP.................................................. 19
SAAJ............................................................. 21

Chapter 3.................................................. 22

Troubleshooting.......................................... 22

Scout and jUDDI pitfalls............................ 22
More Information........................................ 22
About This Guide

What This Guide Contains
The Registry Service contains important information on changes to JBoss ESB 4.2 Milestone Release 3 since the last release and information on any outstanding issues.

Audience
This guide is most relevant to engineers who are responsible for administering JBoss ESB 4.2 Milestone Release 3 installations.

Prerequisites
None.

Organization
This guide contains the following chapters:

- **Chapter 1, What is the Registry**: an overview of what the registry provides and how it is used in JBossESB.
- **Chapter 2, Configuration**: this chapter contains information on how to configure the registry
- **Chapter 2, Example Configurations**: this chapter illustrates some useful configurations.
- **Chapter 3, Troubleshooting**: information covering how to diagnose and fix common problems.

Documentation Conventions
The following conventions are used in this guide:
Additional Documentation

In addition to this guide, the following guides are available in the JBoss ESB 4.2 Milestone Release 3 documentation set:

1. **JBoss ESB 4.2 Milestone Release 3 Trailblazer Guide**: Provides guidance for using the trailblazer example.

2. **JBoss ESB 4.2 Milestone Release 3 Getting Started Guide**: Provides a quick start reference to configuring and using the ESB.

3. **JBoss ESB 4.2 Milestone Release 3 Programmers Guide**: How to use JBossESB.

4. **JBoss ESB 4.2 Milestone Release 3 Release Notes**: Information on the differences between this release and previous releases.

5. **JBoss ESB 4.2 Milestone Release 3 Administration Guide**: How to manage the ESB.

Contacting Us

Questions or comments about JBoss ESB 4.2 Milestone Release 3 should be directed to our support team.
Chapter 1

What is the Registry?

Introduction

In the context of SOA, a registry provides applications and businesses a central point to store information about their services. It is expected to provide the same level of information and the same breadth of services to its clients as that of a conventional market place. Ideally a registry should also facilitate the automated discovery and execution of e-commerce transactions and enabling a dynamic environment for business transactions. Therefore, a registry is more than an “e-business directory”. It is an inherent component of the SOA infrastructure.

Why do I need it?

It is not difficult to discover, manage and interface with business partners on a small scale, using manual or ad hoc techniques. However, this approach does not scale as the number of services, the frequency of interactions, the physical distributed nature of the environment, increases. A registry solution based on agreed upon standards provides a common way to publish and discover services. It offers a central place where you query whether a partner has a service that is compatible with in-house technologies or to find a list of companies that supports shipping services on other side of the globe.

Note: The registry may be replicated or federated to improve performance and reliability. It need not be a single point of failure.

How do I use it?

From a business analyst’s perspective, it is similar to an Internet search engine for business processes. From a developers perspective, they use the registry to publish services and query the registry to discover services matching various criteria.

Registry Vs Repository

A registry allows for the registration of services, discovery of metadata and classification of entities into predefined categories. Unlike a repository, it does not have the ability to store business process definitions or WSDL or any other documents that are required for trading agreements. A registry is essentially a catalogue of items, whereas a repository maintains those items.

SOA components

As the W3C puts it: An SOA is a specific type of distributed system in which the agents are "services" (http://www.w3.org/TR/2003/WD-ws-arch-20030808/#id2617708).

The key components of a Service Oriented Architecture are the messages that are exchanged, agents that act as service requesters and service providers, and shared transport mechanisms that allow the flow of messages. A description of a service that exists within an SOA is essentially just a description of the message exchange pattern between itself and its users. Within an SOA there are thus three critical roles: requester, provider, and broker.
• **Service provider**: allows access to services, creates a description of a service and publishes it to the service broker.

• **Service broker**: hosts a registry of service descriptions. It is responsible for linking a requestor to a service provider.

• **Service requester**: is responsible for discovering a service by searching through the service descriptions given by the service broker. A requestor is also responsible for binding to services provided by the service provider.

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**UDDI**

The Universal Distribution, Discover and Interoperability registry is a directory service for Web Services. It enables service discovery through queries to the UDDI registry at design time or at run time. It also allows providers to publish descriptions of their services to the registry. The registry typically contains a URL that locates the WSDL document for the web services and contact information for the service provider. Within UDDI information is classified into the following categories.

- **White pages**: contain general information such as the name, address and other contact information about the company providing the service.

- **Yellow pages**: categorise businesses based on the industry their services cater to.

- **Green pages**: provide information that will enable a client to bind to the service that is being provided.
Chapter 2

Configuring the Registry

Introduction

The JBossESB Registry architecture allows for many ways to configure the ESB to use either a Registry or Repository. By default, we use a JAXR implementation (Scout) and a UDDI (jUDDI), in an embedded way.

The following properties can be used to configure the JBossESB Registry. In the jbossesb-properties.xml there is a section called 'registry':

```xml
<properties name="registry">
  <property name="org.jboss.soa.esb.registry.implementationClass" value="org.jboss.internal.soa.esb.services.registry.JAXRRegistryImpl"/>
  <property name="org.jboss.soa.esb.registry.factoryClass" value="org.apache.ws.scout.registry.ConnectionFactoryImpl"/>
  <property name="org.jboss.soa.esb.registry.queryManagerURI" value="org.apache.juddi.registry.local.InquiryService#inquire"/>
  <property name="org.jboss.soa.esb.registry.lifeCycleManagerURI" value="org.apache.juddi.registry.local.PublishService#publish"/>
  <property name="org.jboss.soa.esb.registry.user" value="jbossesb"/>
  <property name="org.jboss.soa.esb.registry.password" value="password"/>
  <!-- the following parameter is scout specific to set the type of communication between scout and the UDDI (embedded, rmi, soap) -->
  <property name="org.jboss.soa.esb.scout.proxy.transportClass" value="org.apache.ws.scout.transport.LocalTransport"/>
</properties>
```

In short, the properties are

1. `org.jboss.soa.esb.registry.implementationClass`, a class that implements the jbossesb Registry interface. We have provided one implementation (JAXRRegistry interface).
2. `org.jboss.soa.esb.registry.factoryClass`, the class name of the JAXRConnectionFactory implementation.
3. `org.jboss.soa.esb.registry.queryManagerURI`, the URI used by JAXR to query.
4. `org.jboss.soa.esb.registry.lifeCycleManagerURI`, the URI used by JAXR to edit.
5. `org.jboss.soa.esb.registry.user`, the user used for edits.
6. `org.jboss.soa.esb.registry.password`, the password to go along with the user.
7. `org.jboss.soa.esb.scout.proxy.transportClass`, the name of the class used by scout to do the transport from scout to the UDDI.
The components involved

The registry can be configured in many ways. Figure 1 shows a blueprint of all the registry components. From the top down we can see that the JBossESB funnels all interaction with the registry through the Registry Interface. By default it then calls into a JAXR implementation of this interface. The JAXR API needs an implementation, which by default is Scout. The Scout JAXR implementation calls into a jUDDI registry. However there are many other configuration options.

![Figure 1. Blueprint of the Registry component architecture.](image)

**The Registry Implementation Class**

Property: `org.jboss.soa.esb.registry.implementationClass`

By default we use the JAXR API. The JAXR API is a convenient API since it allows us to connect any kind of XML based registry or repository. However, if for example you want to use Systinet's Java API you can do that by writing your own SystinetRegistryImplementation class and referencing it in this property.

**Using JAXR**

Property: `org.jboss.soa.esb.registry.factoryClass`

If you decided to use JAXR then you will have to pick which JAXR implementation to use. This property is used to configure that class. By default we use Scout and therefore it is set to the scout factory 'org.apache.ws.scout.registryConnectionFactoryImpl'. The next step is to tell the JAXR implementation the location of the registry or repository for
querying and updating, which is done by setting the
org.jboss.soa.esb.registry.queryManagerURI, and
org.jboss.soa.esb.registry.lifeCycleManagerURI respectively, along with the
username (org.jboss.soa.esb.registry.user) and password
(org.jboss.soa.esb.registry.password) for the UDDI.

**Using Scout and jUDDI**

Property: org.jboss.soa.esb.scout.proxy.transportClass

When using Scout and jUDDI there is an additional parameter that one can set. This is the
transport class that should be used for communication between Scout and jUDDI. Thus far
there are 4 implementations of this class which are based on SOAP, SAAJ, RMI and Local
(embedded java). Note that when you change the transport, you will also have to change the
query and lifecycle URIs. For example:

**SOAP**

queryManagerURI  http://localhost:8080/juddi/inquiry
lifeCycleManagerURI  http://localhost:8080/juddi/publish
transportClass  org.apache.ws.scout.transport.AxisTransport

**RMI**

transportClass  org.apache.ws.scout.transport.RMITransport

**Local**

queryManagerURI  org.apache.juddi.registry.local.InquiryService#inquire
lifeCycleManagerURI  org.apache.juddi.registry.local.PublishService#publish
transportClass  org.apache.ws.scout.transport.LocalTransport

For jUDDI we have two requirements that need to be fulfilled:

1. access to the juddi database. You will need to create a schema in your database, and
add the jbossesb publisher. The product/install/jUDDI-registry directory contains db
create scripts for your favorite database.

2. juddi.properties. The configuration of jUDDI itself. If you do not use a datasource you
need to take special care to set the following properties:

```
juddi.isUseDataSource=false
juddi.jdbcDriver=com.mysql.jdbc.Driver
juddi.jdbcUrl=jdbc:mysql://localhost/juddi
juddi.jdbcUsername=juddi
juddi.jdbcPassword=juddi
```

if you do use a datasource you need something like

```
juddi.isUseDataSource=true
juddi.dataSource=java:comp/env/jdbc/juddiDB
```
Configuration Examples

Introduction
As mentioned before, by default the JBossESB is configured to use the JAXR API using Scout as its implementation and jUDDI as the registry. Here are some example how you can use deploy this combo.

Embedded
All ESB components (with components we really mean JVMs in this case) can embed the registry and they all can connect to the same database (or different once if that makes sense).

Properties example:

```
<properties name="registry">
<property name="org.jboss.soa.esb.registry.implementationClass" value="org.jboss.internal.soa.esb.services.registry.JAXRRegistryImpl"/>
<property name="org.jboss.soa.esb.registry.factoryClass" value="org.apache.ws.scout.registry.ConnectionFactoryImpl"/>
<property name="org.jboss.soa.esb.registry.queryManagerURI" value="org.apache.juddi.registry.local.InquiryService#inquire"/>
<property name="org.jboss.soa.esb.registry.lifeCycleManagerURI" value="org.apache.juddi.registry.local.PublishService#publish"/>
<property name="org.jboss.soa.esb.registry.user" value="jbossesb"/>
<property name="org.jboss.soa.esb.registry.password" value="password"/>
<!-- the following parameter is scout specific to set the type of communication between scout and the UDDI (embedded, rmi, soap) -->
<property name="org.jboss.soa.esb.scout.proxy.transportClass" value="org.apache.ws.scout.transport.LocalTransport"/>
</properties>
```
**RMI using the juddi.war or jbossesb.sar**

Deploy a version of the jUDDI that brings up an RMI service. The JBossESB comes with a juddi.war in the product/install/jUDDI-registry directory. This war brings up the regular webservices but also an RMI service. Along with the juddi.war you need to deploy a datasource which points to your jUDDI database. An example file is supplied for mysql. Note that the jbossesb.sar also registers a rmi service. So you'd only need to deploy the juddi.war if you need webservice access.

**Figure 3. RMI using the juddi.war**

Properties example:

```xml
<properties name="registry">
  <property name="org.jboss.soa.esb.registry.implementationClass" value="org.jboss.internal.soa.esb.services.registry.JAXRRegistryImpl"/>
  <property name="org.jboss.soa.esb.registry.factoryClass" value="org.apache.ws.scout.registry.ConnectionFactoryImpl"/>
</properties>
```
<property name="org.jboss.soa.esb.registry.lifeCycleManagerURI" value="jnp://localhost:1099/PublishService?org.apache.juddi.registry.rmi.Publisher#publish"/>
<property name="org.jboss.soa.esb.registry.user" value="jbossesb"/>
<property name="org.jboss.soa.esb.registry.password" value="password"/>

<!-- the following parameter is scout specific to set the type of communication between scout and the UDDI (embedded, rmi, soap) -->
<property name="org.jboss.soa.esb.scout.proxy.transportClass" value="org.apache.ws.scout.transport.RMITransport"/>

The juddi.war is configured to bring up a RMI Service, which is triggered by the following setting in the web.xml

<!-- uncomment if you want to enable making calls in juddi with rmi -->
<servlet>
  <servlet-name>RegisterServicesWithJNDI</servlet-name>
  <servlet-class>org.apache.juddi.registry.rmi.RegistrationService</servlet-class>
  <load-on-startup>1</load-on-startup>
</servlet>

Make sure to include -for example- the following JNDI settings in your juddi.properties:

# JNDI settings (used by RMITransport)
java.naming.factory.initial=org.jnp.interfaces.NamingContextFactory
java.naming.provider.url=jnp://localhost:1099
java.naming.factory.url.pkgs=org.jboss.naming

\| Note: The RMI clients need to have the scout-client.jar in their classpath.

**RMI using your own JNDI Registration of the RMI Service**

If you don't want to deploy the juddi.war you can setup one of the ESB components that runs in the the same JVM as jUDDI to register the RMI service. While the other applications need to
**Figure 4. RMI using your own JNDI registration**

Properties example: For application 1 you need the Local settings:

```xml
<properties name="registry">
    <property name="org.jboss.soa.esb.registry.implementationClass" value="org.jboss.internal.soa.esb.services.registry.JAXRRegistryImpl"/>
    <property name="org.jboss.soa.esb.registry.factoryClass" value="org.apache.ws.scout.registry.ConnectionFactoryImpl"/>
    <property name="org.jboss.soa.esb.registry.queryManagerURI" value="org.apache.juddi.registry.local.InquiryService#inquire"/>
    <property name="org.jboss.soa.esb.registry.lifeCycleManagerURI" value="org.apache.juddi.registry.local.PublishService#publish"/>
    <property name="org.jboss.soa.esb.registry.user" value="jbossesb"/>
    <property name="org.jboss.soa.esb.registry.password" value="password"/>
    <!-- the following parameter is scout specific to set the type of communication between scout and the UDDI (embedded, rmi, soap) -->
    <property name="org.jboss.soa.esb.scout.proxy.transportClass" value="org.apache.ws.scout.transport.LocalTransport"/>
</properties>
```

while for application 2 you need the RMI settings:

```xml
<properties name="registry">
    <property name="org.jboss.soa.esb.registry.implementationClass" value="org.jboss.internal.soa.esb.services.registry.JAXRRegistryImpl"/>
    <property name="org.jboss.soa.esb.registry.factoryClass" value="org.apache.ws.scout.registry.ConnectionFactoryImpl"/>
    <property name="org.jboss.soa.esb.registry.lifeCycleManagerURI" value="jnp://localhost:1099/PublishService?org.apache.juddi.registry.rmi.Publisher#publish"/>
    <property name="org.jboss.soa.esb.registry.user" value="jbossesb"/>
    <property name="org.jboss.soa.esb.registry.password" value="password"/>
    <!-- the following parameter is scout specific to set the type of communication between scout and the UDDI (embedded, rmi, soap) -->
```
Where the hostname of the queryManagerURI and lifeCycleManagerURI need to point to the hostname on which jUDDI is running (which would be where application1 is running). Obviously application1 needs to have access to a naming service. To do the registration process you need to do something like:

```java
//Getting the JNDI setting from the config
String factoryInitial = Config.getStringProperty(
    Properties env = new Properties();
    env.setProperty(RegistryEngine.PROPERTY_JAVA_NAMING_FACTORY_INITIAL, factoryInitial);
    env.setProperty(RegistryEngine.PROPERTY_JAVA_NAMING_PROVIDER_URL, providerURL);
    env.setProperty(RegistryEngine.PROPERTY_JAVA_NAMING_FACTORY_URL_PKGS, factoryURLPkgs);
    log.info("Creating Initial Context using: \n" + RegistryEngine.PROPERTY_JAVA_NAMING_FACTORY_INITIAL + "=" + factoryInitial + "\n" + RegistryEngine.PROPERTY_JAVA_NAMING_PROVIDER_URL + "=" + providerURL + "\n" + RegistryEngine.PROPERTY_JAVA_NAMING_FACTORY_URL_PKGS + "=" + factoryURLPkgs + "\n");
    InitialContext context = new InitialContext(env);
    Inquiry inquiry = new InquiryService();
    log.info("Setting " + INQUIRY_SERVICE + ", " + inquiry.getClass().getName());
    mInquiry = inquiry;
    context.bind(INQUIRY_SERVICE, inquiry);
    Publish publish = new PublishService();
    log.info("Setting " + PUBLISH_SERVICE + ", " + publish.getClass().getName());
    mPublish = publish;
    context.bind(PUBLISH_SERVICE, publish);
```

### 2.4 SOAP

Finally, you can make the communication between Scout and jUDDI SOAP based. Again you need to shutdown the RMI service by commenting out the `RegisterServicesWithJNDI` servlet in the `web.xml`. Then you can connect to the Scout and jUDDI web services with the following configuration:
Figure 5. SOAP.

Properties example:

```xml
<properties name="registry">
    <property name="org.jboss.soa.esb.registry.implementationClass" value="org.jboss.internal.soa.esb.services.registry.JAXRRegistryImpl"/>
    <property name="org.jboss.soa.esb.registry.factoryClass" value="org.apache.ws.scout.registry.ConnectionFactoryImpl"/>
    <property name="org.jboss.soa.esb.registry.queryManagerURI" value="http://localhost:8080/juddi/inquiry"/>
    <property name="org.jboss.soa.esb.registry.lifeCycleManagerURI" value="http://localhost:8080/juddi/publish"/>
    <property name="org.jboss.soa.esb.registry.user" value="jbossesb"/>
    <property name="org.jboss.soa.esb.registry.password" value="password"/>
    <!-- the following parameter is scout specific to set the type of communication between scout and the UDDI (embedded, rmi, soap) -->
    <property name="org.jboss.soa.esb.scout.proxy.transportClass" value="org.apache.ws.scout.transport.AxisTransport"/>
</properties>
```

SAAJ

JBoss 4.0.x comes with scout and juddi. If you run in clustered mode ('all'). It brings up the jUDDI registry to which you can communicate using SAAJ. This is an untested feature.
Troubleshooting

Scout and jUDDI pitfalls

- Make sure to put our version of the jaxr-api-1.0.jar, scout-0.7rc2-embedded.jar and the juddi-embedded.jar first. Other versions of these libraries are present in the JbossAS libraries and they are, for the time being, incompatible. This should get resolved in future release of the Application Server.

- If you use RMI you need the juddi-client.jar.

- Make sure the jbossesb-properties.xml file is on the classpath and read or else the registry will try to instantiate classes with the name of 'null'.

- Make sure you have a juddi.properties file on your classpath for jUDDI to configure itself.

- Make sure to read the README in the product/install/jUDDI-registry directory, to prepupolate your own juddi database.

- In the event that a service fails or does not shut down cleanly, it is possible that stale entries may persist within a registry. You will have to remove these manually.

More Information

- For more information see the wiki http://labs.jboss.com/wiki/JudyEvaluation


- When you deploy the juddi.war that ship with our esb, you enable access through soap, which means that you can use any uddi brower. You can use http://uddibrowser.org