JBoss ESB 4.2 GA

Getting Started With JBoss ESB

JBESB-GS-9/1/07
Legal Notices

The information contained in this documentation is subject to change without notice.

JBoss Inc. makes no warranty of any kind with regard to this material, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose. JBoss Inc. shall not be liable for errors contained herein or for incidental or consequential damages in connection with the furnishing, performance, or use of this material.

Java™ and J2EE is a U.S. trademark of Sun Microsystems, Inc. Microsoft® and Windows NT® are registered trademarks of Microsoft Corporation. Oracle® is a registered U.S. trademark and Oracle9™, Oracle9 ServerTM Oracle9 Enterprise Edition™ are trademarks of Oracle Corporation. Unix is used here as a generic term covering all versions of the UNIX® operating system. UNIX is a registered trademark in the United States and other countries, licensed exclusively through X/Open Company Limited.

Copyright

JBoss, Home of Professional Open Source Copyright 2006, JBoss Inc., and individual contributors as indicated by the @authors tag. All rights reserved.

See the copyright.txt in the distribution for a full listing of individual contributors. This copyrighted material is made available to anyone wishing to use, modify, copy, or redistribute it subject to the terms and conditions of the GNU General Public License, v. 2.0. This program is distributed in the hope that it will be useful, but WITHOUT A WARRANTY; without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.

See the GNU General Public License for more details. You should have received a copy of the GNU General Public License, v. 2.0 along with this distribution; if not, write to the Free Software Foundation, Inc., 51 Franklin Street, Fifth Floor, Boston, MA 02110-1301, USA.

Software Version

JBoss ESB 4.2 GA

Restricted Rights Legend

Use, duplication, or disclosure is subject to restrictions as set forth in contract subdivision (c)(1)(ii) of the Rights in Technical Data and Computer Software clause 52.227-FAR14.

© Copyright 2007 JBoss Inc.
**Contents**

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contents</td>
<td>iv</td>
</tr>
<tr>
<td>About This Guide</td>
<td>5</td>
</tr>
<tr>
<td>What This Guide Contains</td>
<td>5</td>
</tr>
<tr>
<td>Audience</td>
<td>5</td>
</tr>
<tr>
<td>Prerequisites</td>
<td>5</td>
</tr>
<tr>
<td>Organization</td>
<td>5</td>
</tr>
<tr>
<td>Documentation Conventions</td>
<td>6</td>
</tr>
<tr>
<td>Additional Documentation</td>
<td>7</td>
</tr>
<tr>
<td>Contacting Us</td>
<td>7</td>
</tr>
<tr>
<td>Getting Started</td>
<td>8</td>
</tr>
<tr>
<td>Deploy JBoss ESB to JbossAS 4.2.1.GA or JBossESB 4.2.0.GA Server</td>
<td>8</td>
</tr>
<tr>
<td>ESB archive deployment strategies</td>
<td>9</td>
</tr>
<tr>
<td>The Hello World QuickStart</td>
<td>10</td>
</tr>
<tr>
<td>Components of the QuickStart</td>
<td>11</td>
</tr>
<tr>
<td>ESB Aware and Unaware Messages</td>
<td>12</td>
</tr>
<tr>
<td>QuickStart Sequence of Events</td>
<td>13</td>
</tr>
<tr>
<td>Running other Quickstarts</td>
<td>14</td>
</tr>
<tr>
<td>TrailBlazer</td>
<td>15</td>
</tr>
<tr>
<td>Overview</td>
<td>15</td>
</tr>
</tbody>
</table>
About This Guide

What This Guide Contains

The goal of this document is to assist you in getting test applications up and running on JBossESB as quickly as possible.

Audience

This guide is for anyone who is wants to quickly understand how to install and use JBoss ESB 4.2 GA.

Prerequisites

None.

Organization

This guide contains the following chapter:

1. Chapter 1, Installation: This chapter reviews prerequisites (software needed to operate JBossESB), downloading JBossESB, and building JBossESB.

2. Chapter 2, Trailblazer: A quick summary of the trailblazer example application.
The following conventions are used in this guide:

<table>
<thead>
<tr>
<th>Convention</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Italic</strong></td>
<td>In paragraph text, italic identifies the titles of documents that are being referenced. When used in conjunction with the Code text described below, italics identify a variable that should be replaced by the user with an actual value.</td>
</tr>
<tr>
<td><strong>Bold</strong></td>
<td>Emphasizes items of particular importance.</td>
</tr>
<tr>
<td><strong>Code</strong></td>
<td>Text that represents programming code.</td>
</tr>
<tr>
<td>**Function</td>
<td>Function**</td>
</tr>
<tr>
<td>( ) and</td>
<td>Parentheses enclose optional items in command syntax. The vertical bar separates syntax items in a list of choices. For example, any of the following three items can be entered in this syntax:</td>
</tr>
<tr>
<td>persistPolicy (Never</td>
<td>OnTimer</td>
</tr>
<tr>
<td><strong>Note:</strong></td>
<td>A note highlights important supplemental information.</td>
</tr>
<tr>
<td><strong>Caution:</strong></td>
<td>A caution highlights procedures or information that is necessary to avoid damage to equipment, damage to software, loss of data, or invalid test results.</td>
</tr>
</tbody>
</table>

Table 1 Formatting Conventions

**Additional Documentation**

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

1. **JBoss ESB 4.2 GA Trailblazer Guide**: Provides guidance for using the trailblazer example.
2. **JBoss ESB 4.2 GA Administration Guide**: How to manage JBossESB.
3. **JBoss ESB 4.2 GA Programmers Guide**: How to use JBossESB.
4. **JBoss ESB 4.2 GA Release Notes**: Information on the differences between this release and previous releases.
5. **JBoss ESB 4.2 GA Services Guides**: Various documents related to the services available with JBossESB.

**Contacting Us**

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

Getting Started

The quickest way to get started using JBoss ESB is by running one of the quickstarts in the samples/quickstarts folder. This will also perform a basic validation of your system. Before doing this however, be sure to check that your system meets the following minimum requirements:

1. JDK 5 (v1.5.0_06 recommended)
2. Ant (v1.6.5 recommended)
3. JBoss Application Server 4.2.1.GA or JBoss ESB Server 4.2.0.GA

There are three ways to run JBossESB. You can deploy it to JBossAS / JBossESB Server, run standalone, or deploy it to Tomcat. The first step is to locate the 'deployment.properties' in the install directory, and edit the properties set in this file. This document assumes you have Ant (1.6.5 or higher) and Java5 installed on your machine, and that you have a fresh copy of JBossAS. So now go and download the JBoss ESB 4.2 GA distribution from [http://labs.jboss.com/portal/jbossesb/downloads](http://labs.jboss.com/portal/jbossesb/downloads)

There are three corresponding distribution versions, jbossesb-server-{version}, jbossesb-{version} and jbossesb-{version}-src. The standalone JBossESB Server execution requires the jbossesb-server-{version} distribution while deployed execution requires the jbossesb-{version} distribution.

The JBossESB Server is provided as a convenient and lightweight container to deploy to. It contains the majority of the components of the JBoss application server, but does not contain EJB3. The main advantage of using the ESB Server over using the JBoss 4.2.1.GA application server is a much quicker boot time, which is helpful during development.

**Deploy JBoss ESB to JBossAS 4.2.1.GA or JBossESB 4.2.0.GA Server**

2. Use jbossesb-{version}/iinstall/deployment.properties.example as a template to create install/deployment.properties.
3. Edit your version of install/deployment.properties. Open this file and edit the following lines if needed:

   ```properties
   # application server root directory
   org.jboss.esb.server.home=/jboss-4.2.0.GA
   # the instance of jboss you are running (default)
   org.jboss.esb.server.config=default
   ```

   3. Run 'ant' (default target) from the install directory. This will deploy JBossESB to your JBossAS instance. It copies several .sar and .esb archives files and
directories (jbossesb.esb, jbpm.esb, jbrules.esb, smooks.esb, spring.esb, soap.esb) into the application server's deploy directory.

4. You can deploy custom code (actions) by deploying the '.esb' archives into the deploy directory.

5. Start your application server.

ESB archive deployment strategies

JBossESB is packaged and shipped with base services. A service should be deployed in an ESB archive consisting of an action code + configuration. The idea behind an ESB archive is that it is a deployable service unit. An ESB archive is simply a zip file with an .esb extension. You can deploy as many ESB archives as you please. You can influence the deployment order of archives using the deployment.xml. Typically you would deploy an ESB archive to the 'deploy' directory. ESB archives should enable you to move services between servers simply by moving the corresponding ESB archive. An ESB archive file has the following structure:

```
META-INF
|-- jboss-esb.xml
|  |-- <deployment.xml>
|  |-- MANIFEST.MF
|  |-- <java classes>
|  |-- <jars>
|  `-- <queue-service.xml>
```

where,

- `<jboss-esb.xml>`: contains the service configuration (listener and actions), as well as provider configuration.
- `<deployment.xml>`: is optional, but can be used for 2 reasons:
  - make this .esb archive depend on other archives, to specify classloading order.
  - make the deployment of this .esb archive scoped.
- `<java classes>`: your custom action classes in standard package hierarchy.
- `<jars>`: additional jar archives your actions depend on.
- `<queue-service.xml>`: if the 'providers' section of the jboss-esb.xml references queues or topics, you can deploy their configuration in the ESB archive. Note that this is strictly a convenience and any other way to deploy these queues is fine too. We recommend this approach to keep your deployments as self-contained as possible therefore keeping dependency management simple.

**JBossESB** ships with a number of standard service archives:

- `jbossesb.esb`: - internal services like the [DeadLetterService](#).
- `jbrules.esb`: - needed for rules evaluation using [JBossRules](#), for services like the [Content-Based Router](#).
- `jbpm.esb`: - needed for default provider of Business Process Management [jBPM](#), and
- `smooks.esb`: - default message transformation engine [Smooks](#).
These services are deployed by default, but you should be able to remove them if you don't need these service deployments.

**Note:** You cannot (yet) deploy ESB archives to the Tomcat deployment.

---

**The Hello World QuickStart**

This QuickStart allows you to get up and running with JBossESB, out of the box. It is located in the distribution under `samples/quickstarts/helloworld`.

To run this QuickStart:

1. Start your Server in a way that allows you to view the output console. If you are on Windows, it is preferable not to run JBoss as a Windows Service for the purposes of this guide.

2. From a command terminal window, change directory into the `samples/quickstarts/helloworld` directory.

3. Make sure that `install/deployment.properties` has the correct config and home directory settings for your server.

4. Type “ant deploy” to deploy the `helloworld.esb` package archive to your application server.

5. Type “ant runtest”.

6. Switch back to your application server's console. You should soon see a “Hello World” message appear in your application server's console.

7. That's it! The QuickStart ran successfully. Your environment is properly configured for JBossESB.

You can find more detailed directions on how to setup the quickstart examples by running “ant help-quickstarts” under any of the specific quickstart directories. To get information on how to run a particular quickstart under different deployment scenarios, change directory to the specific quickstart and type “ant help”.

---
Components of the QuickStart

The following diagram illustrates the sequence of events that take place in this QuickStart. It touches on a number of the key concepts within JBossESB.

Window1 shows each of the main “ESB” components used in this sample:

1. **Service Registry**: This is a JAXR Registry implementation. In this QuickStart, the registry uses RMI based communication. See `docs/services/RegistryConfiguration.pdf` for more details on the Registry Service.

2. **JMS Gateway Listener**: A “Gateway Listener” is one of the key architectural components within JBossESB. This listener type is, as its name would suggest, the gateway to the ESB from endpoints outside the domain of the ESB. In this case, we're using a JMS Gateway.

3. **The ESB Aware Service Listener**: The “FirstService:SimpleListener” ESB Aware Service Listener listens for “ESB Aware” messages on “queue/quickstart_helloworld_Request_gw”. This introduces you further to the concept of ESB “Aware” and “Unaware” messages. We will touch on these next.

---

1 Use the “Zoom” features of your viewer to see the diagram in more detail.

JBESB-GS-9/1/07 10
ESB Aware and Unaware Messages

JBossESB has a well defined concept of what a message is. This is defined fully in `xml/message.xsd`. This construct makes it possible to pass decorated messages payloads between components of the ESB. The message payload is typically stored in the message “Body” (see the Programmers Guide).

This makes a lot of sense from the point of services in within the ESB domain being able to collaborate effectively. However, it is not practical to expect endpoints outside the domain of a JBossESB deployment to be “aware” of these internal ESB constructs. For this reason, JBossESB has the concept of ESB Aware and Unaware Messages and Endpoints, with the Gateway acting as the bridge (adapter) between the two worlds.
QuickStart Sequence of Events

1. ESB Unaware JMS Client endpoint puts an ESB Unaware “Hello World” Message (plain String Object) into JMS Queue “queue/quickstart_helloworld_Request”.

2. The JMS Gateway Listener receives the ESB Unaware message. The Gateways Job is to adapt this message by making it an ESB Aware Message for consumption by an ESB Aware Endpoint.

3. The JMS Gateway Listener uses the registry to lookup the Endpoint Reference (EPR) for “FirstService:SimpleJMSService” Service. This works out to be JMS Queue “queue/quickstart_helloworld_Request_gw”.

4. The JMS Gateway Listener “adapts” the message into an ESB Aware message and places it into JMS Queue “queue/=quickstart_helloworld_Request_gw”.

5. “FirstService:SimpleJMSService” Service receives the message.

6. “FirstService:SimpleJMSService” Service extracts the payload from the message and prints it to the console.
Running other Quickstarts

Once you have successfully run the Helloworld QuickStart and understand the concepts involved, there are many other Quickstarts to try. Please note that the Quickstarts have different requirements which are documented in their respective readme.txt, and that not all of the Quickstarts will run in every deployment. Below is a suggested map of Quickstarts to follow in order:

Quickstarts Trailmap:

1. helloworld
2. helloworld_action
3. more_action
4. helloworld_file_action
5. helloworld_ftp_action
6. simple_cbr
7. fun_cbr
8. business_service
9. business_rules_service
10. scripting_groovy
11. transform_CSV2XML
12. transform_XML2POJO
13. transform_XML2XML_simple
14. transform_XML2XML_date_manipulation
15. aggregator
16. bpm_orchestration1
17. bpm_orchestration2
18. webservice_consumer1
19. webservice_producer
Overview

JBoss TrailBlazers and Demo Applications are designed to help you get up and running quickly with JBoss products and technologies. We encourage you to Run them, Download them, and enjoy the learning process!

The Loan Broker TrailBlazer example was developed to verify your JBossESB installation and also to exhibit some of the numerous capabilities of JBossESB. This example was based on information from Enterprise Integration Patterns, along with the example found at JavaZone 2005.

For details of configuring and running the TrailBlazer, see the accompanying “Trailblazer” document.