JBoss BPEL User Guide

Version: 3.2.0.Beta

1. JBoss BPEL project Overview	1
1.1. Key Features of JBoss BPEL project	1
2. Installation JBoss BPEL Tools	. 2
2.1. Installation JBoss BPEL editor	. 2
2.2. Prerequisites	2
2.3. Installation JBoss BPEL Runtime	. 2
3. Tasks	3
3.1. Creating and editing a BPEL project	3
3.1.1. Creating a BPEL project	. 3
3.1.2. Creating a BPEL process	5
3.1.3. Editing a BPEL process file	8
3.1.4. Adding Service to WSDL file	11
3.2. Deploy a JBoss BPEL project to JBoss BPEL Runtime	15
3.2.1. Creating a bpel-deploy.xml file	15
3.2.2. Creating JBoss BPEL Server	18
4. Reference	22
4.1. Wizards	22
4.1.1. New BPEL project Wizard	22
4.1.2. Apache ODE Deployment Descriptor Wizard	23
4.1.3. New BPEL Process file Wizard	24
4.2. Editors	26
4.2.1. Business Process Editor	26
4.2.2. ODE Deployment Descriptor Editor	31
5. Summary	35
5.1. Other relevant resources on the topic	35

JBoss BPEL project Overview

JBoss BPEL project is a WS-BPEL 2.0 project that gives a way to create, edit, validate and deploy BPEL files to JBoss BPEL runtime. It is based on Eclipse <u>BPEL project</u> [http://www.eclipse.org/ bpel/].

It improves the Eclipse BPEL project in the following way:

- Implements close integration with JBoss BPEL runtime. Adds a new project type for the deployment to JBoss BPEL runtime.
- Supports two ways of deployment: one way is to deploy a bpel project directly to JBoss BPEL runtime. The other way is to deploy bpel files in JBoss ESB project to JBoss BPEL runtime.
- Improves the BPEL validator and increases Eclipse BPEL editor's quality.

<u>WS-BPEL 2.0</u> [http://docs.oasis-open.org/wsbpel/2.0/OS/wsbpel-v2.0-OS.html] stands for Web Service Business Process Execution Language. Like EAI, BPEL is an XML-based language, but BPEL is more specific and targeted. A programmer uses BPEL to join sometimes disparate functions into an integrated process, resulting in a seamless use of the Internet to conduct business transactions ranging from simple money exchanges to complex calculations and asset reallocation.

1.1. Key Features of JBoss BPEL project

Let's start with looking through the table of the main features of JBoss BPEL editor project:

Feature	Benefit
WS-BPEL 2.0 support	JBoss BPEL project supports the newest WS-BPEL 2.0 specifications.
Close integration with JBoss BPEL runtime	There are two ways to deploy BPEL files to JBoss BPEL runtime. The user can deploy a BPEL project as a whole and can deploy BPEL files in JBoss ESB project to JBoss BPEL runtime.
BPEL file editor	The user can use the editor separately to edit a BPEL file.
BPEL file validator	The validator can give the error messages about BPEL files to the user.

Table 1.1	. Key Functio	nality for JBos	s BPEL edito	r project
-----------	---------------	-----------------	--------------	-----------

Installation JBoss BPEL Tools

2.1. Installation JBoss BPEL editor

At first, you need Eclipse 3.5. You can get it from <u>*Eclipse Web Site*</u> [http://www.eclipse.org/ downloads/download.php?file=/technology/epp/downloads/release/galileo/].

The JBoss BPEL editor is included into JBoss Tools. You have some methods to install JBoss Tools. See *Installing JBoss Tools* [http://www.jboss.org/tools/download/installation.html] for more information.

If you want to install only the JBoss BPEL editor, you can install it from <u>JBoss Tools</u> [http:// jboss.org/tools/download/dev.html] page separately. Please, note, that only JBoss Tools 3.1 or higher version includes JBoss BPEL editor.

2.2. Prerequisites

For installation and configuring BPEL engine into a JBossAS environment you will need the following:

- JBossAS (version 5.1.0.GA or higher), available from <u>http://www.jboss.org/jbossas</u> [http:// www.jboss.org/jbossas].
- RiftSaw (version 2.0 or higher), available from http://www.jboss.org/riftsaw.
- Ant, available from *here* [http://ant.apache.org].

2.3. Installation JBoss BPEL Runtime

- Unpack the JBossAS installation archive into the required location.
- Unpack the RiftSaw distribution into the location alongside the JBossAS installation:
 - Edit the install/deployment.properties file to update the JBossAS location settings.
 - From the install folder, run: ant deploy -Ddatabase=hsql to deploy RiftSaw to JBossAS.
- Then in the \${RiftSaw}/install folder run the command: ant deploy -Ddatabase=hsql Dws.stack=native -Dws.version=3.2.2.GA It will help you to download the web service stack, and then upgrade it for JBoss AS.

Tasks

3.1. Creating and editing a BPEL project

In the chapter we describe the necessary steps to create a new BPEL project and edit the BPEL files. You can get the source of the example from riftsaw/samples/quickstart/hello_world. Here and further in the guide we will create a simple echo example, used to respond to a sent message with a modified version of the request message being returned in a response. First of all, you should create a BPEL project.

3.1.1. Creating a BPEL project

Create the project by selecting *New > Project... > BPEL 2.0 > BPEL Project* from the menu bar. Then click the Next button.

New Project	×
Select a wizard	
Create a new BPEL project.	
<u>W</u> izards:	
type filter text	4
👂 🗁 General	^
▼ 🗁 BPEL 2.0	
💕 BPEL Project	=
Business Intelligence and Reporting Tools	
▷ 🧁 C/C++	
CVS	
Drools	
Eclipse Modeling Framework	
🕨 🧁 EJB	
(2) < Back Next > Cancel F	inish
	,

Figure 3.1. New BPEL Project

On this page of the New BPEL Project Wizard enter a project name in the Project Name field, e.g enter HelloWorld.

New BPEL Project	×
New BPEL Project	
Create a new BPEL 2.0 project.	
Project na <u>m</u> e: HelloWorld	
Project location	
✓ Use <u>d</u> efault location	
Location: /home/bbrodt/eclipse-3.6/workspace/HelloWorld	Browse
	Finish
< <u>Back</u> <u>Next</u> > Cancel	Finish

Figure 3.2. New BPEL Project Wizard

Click the Finish button. So you have created the BPEL project named HelloWorld. Its structure is like this:



Figure 3.3. The BPEL Project structure

3.1.2. Creating a BPEL process

Now you should create a BPEL process. You can create it by selecting *New > Others... > BPEL* 2.0 > *New BPEL Process File*.

Select a wizard	O New	×
Wizards: type filter text Image: Second state of the second state	Select a wizard	
type filter text Image: Second state Image: Second state <t< th=""><th><u>W</u>izards:</th><th></th></t<>	<u>W</u> izards:	
Plug-in Project ➢ General ➢ BPEL 2.0 Ý Apache ODE Deployment Descriptor ☆ BPEL Project ➢ New BPEL Process File ▷ ➢ Business Intelligence and Reporting Tools ▷ ➢ C/C++ ▷ 준 CD ✓ < Back Next > Cancel Finish	type filter text	4
Plug-in Project ▷ General ♥ BPEL 2.0 Ŷ Apache ODE Deployment Descriptor ☆ BPEL Project ● New BPEL Process File ▷ Business Intelligence and Reporting Tools ▷ ⓒ C/C++ ▷ ⓒ CV > < Back Next > Cancel Finish	A	<u>^</u>
General General Apache ODE Deployment Descriptor Apache ODE Deployment Descriptor BPEL Project New BPEL Process File Business Intelligence and Reporting Tools Bost C/C++ Concel Second Second Second Second Second Finish	a Plug-in Project	
✓ ➢ BPEL 2.0	General	
Y Apache ODE Deployment Descriptor BPEL Project New BPEL Process File Business Intelligence and Reporting Tools C/C++ C CPU	▼ 🗁 BPEL 2.0	
PEL Project New BPEL Process File ▷ ⇔ Business Intelligence and Reporting Tools ▷ ⇔ C/C++ ▷ ⇔ Cot ✓	Y Apache ODE Deployment Descriptor	
New BPEL Process File ▷ Business Intelligence and Reporting Tools ▷ C/C++ ▷ C CPI ✓	🕋 BPEL Project	
Business Intelligence and Reporting Tools C/C++ Contended Contended Cancel Finish	🔊 New BPEL Process File	
C/C++	Business Intelligence and Reporting Tools	
Cancel Finish	▷ 🗁 C/C++	
(?) < Back Next > Cancel Finish		\¥
(?) < Back Next > Cancel Finish		
(?) < Back Next > Cancel Finish		
(?) < Back Next > Cancel Finish		
Cancel Finish		
	Cance	<u>E</u> inish

Figure 3.4. New BPEL Process File

Click the Next button. Enter the following information:

Table 3.1. Fields and values

Field	Value
BPEL Process Name	enter a process name. For example, HelloWorld.
Namespace	enter or select a namespace for the BPEL process.
Template	Select the necessary template for the BPEL process. When you select the template, you will see the information about the template below on the page.In our case you should select Synchronous BPEL Process.

۲	New BPEL Process	×
Create a BPEL Proce	ss File	5
Create a 2.0 BPEL file.		Y,
Process Details		
BPEL Process Name:	HelloWorld	
Namespace:	http://eclipse.org/bpel/sample	~
Template:	Synchronous BPEL Process	
Generates an empty B process body. The call client interface is gene	PEL process. Only receive and reply activities are placed in t er will block until all the steps in the process have completed erated.	the d. A
Abstract Process		
?	< <u>B</u> ack <u>N</u> ext > Cancel <u>F</u> inish	1

Figure 3.5. New BPEL Process File Wizard

Click the Next button. On the second page make sure that the folder HelloWorld/bpelContent is selected. Click Finish.



Up to now, you have got a simple BPEL process as on the screen below.

0		Web - HelloWorld/bpelContent/HelloWorld.ppel - Ec	lipse	
<u>F</u> ile <u>E</u> dit <u>N</u> avigate Se <u>a</u> rch <u>P</u> roje	ect <u>R</u> un <u>W</u> indow <u>H</u>	ielp 2		
] 🗗 · 🔛 🐚 🍈] 🍫 O · 🏊 ·	·] 😂 🖾 🔗 ·] 🤇	🗕] 🖸 😫 📑] 48] 🗧 🖡 🕨 🦄 🖉 🖉 🖓 🖓 🖓 🖉	♥ ♦ ♥] 🖻 🚳	🗈 🮯 Web 📌 Java EE
ြို့ Project Explorer 🛿 🦳 🗖	HelloWorld.bpel 3	×		🗝 🗖 📴 Outline 🛿 👘 🗖
Image: Second state Image: Second state <		main m m in in	Palette P Selection Tool Control Partner Unks Client Partner Unks Client Partner Unks Client Partner Unks Client Variables input output @ Correlation S. @ Correlation	id ♥ ♥ Partner Links © client ♥ ♥ Partner Links © client ♥ ♥ Variables ● input ● output © Correlation Sets ♥ ™ Message Exchanges ♥ ™ Message Exchanges ♥ ™ Message Exchanges ♥ ™ Partner Links ● input ● output © output © FiX_ME-Add_Busine ♥ replyOutput
	Design Source			
	🖹 Problems 🕷 Ser	vers Properties 🛛	r 🗸	
	HelloWorld Description Details Join Behavior Imports Documentation	Name: HelloWorld Target namespace: http://eclipse.org/bpel/sample		
< III >>				< III >

Figure 3.6. A simple BPEL Process File

The next step, you can do is to edit the BPEL process file and then deploy it to JBoss server.

3.1.3. Editing a BPEL process file

If the *Properties view* and *Palette view* are not opened, you can open the views by right-clicking the BPEL editor and selecting Show in Properties, Show Palette in Palette view. Then you should have the view like this:

۲		Web - Hello	World/bpelContent/HelloWorld.b	pel - Eclip	ose		
<u>File Edit Navigate Search Proje</u>	ct <u>R</u> un <u>W</u> indow <u>H</u> elp						
] 🗈 · 🔛 🐚 🗁] 🍫 O · 🏊 ·	·] 😂 😂 🖋 -] 🥹]	8 1 2	\$] <~ ▶ % ○ 종]읽~		• • • •] 🗟 🔯		🖹 🮯 Web 😤 Java EE
ြဲ Project Explorer 🛚 🗧 🗖	T *HelloWorld.bpel 83					- 0	🗄 Outline 🛿 🗖 🗖
 RelloWorld BpelContent BelContent BelloWorld.bpel BelloWorldArtifacts.wsdl 		er rec	main evenput lySitout S Sequence main ●		Palette p Selection Tool Actions Actions Activity Assign Control2 Control2 Fick Faults Fick Zoom In Cocom Out	. A HelloWorld Dranter Links ● * client Variables ● * input output @ Correlation S ● * Message Exc ● *	B Partner Links ⊂ client ♥ Variables ● input ● output © Correlation Sets ∰ Message Exchanges ♥ BraceiveInput ♥ replyOutput
	Problems & Servers	Properties S					
	a rophOutput						
	Description Details Join Behavior Correlation Message Exchange Documentation	Partner Link: Operation: Fault Name:	Client process Message Parts Mapping		Quick Pick: ♥ ☐ client ♥ ④ HelloWorld ▷ ⊕ process		
		⊻ariable:	output			1	<
bpel:process/bpel:sec	quence/bpel:reply						

Figure 3.7. The BPEL editor view

In the *Palette view*, you can drag a BPEL element to the BPEL editor and drop it in the place you want.

In the *Properties view*, you can get the information about every element of the BPEL process. In the BPEL editor select any element you want, and then the element's properties will be shown in the Properties view. The table below describes the tabs of the Properties view:

	Table 3.2.	Tabs	of the	Propert	y view
--	------------	------	--------	---------	--------

Tab	Description
Description	Shows the descriptive information about the element, e.g. Name of the element.
Details	Shows the detailed and important information about the element. It is the most important section of an element. Most of the properties of an element are set in this section.
Join Behavior	Shows the Join Failure property of the element.
Documentation	Shows the documentation sub-element of an element.
Other	Every BPEL element has its own sections: Correlation section, Message Exchange section, and so on. We will introduce them while using them.

In order to see how a simple BPEL process works in action, you should do some steps as below:

- Modify two variables of the process:
 - Click on the details tab of the input variable, select Browse.... Then choose string primitive from the list.

Choose type of variable	×
Type Name (* or ? are wildcards):	
Show XSD Types	
From Imports From Project From Workspace	
Tile-	
Pitter	
Flement Declarations Messages Show Duplicates	
Matches:	
{http://www.w3.org/2001/XMLSchema}positiveInteger	^
[http://www.w3.org/2001/XMLSchema}QName	
(http://www.w3.org/2001/XMLSchema.)string	
(http://www.w3.org/2001/XMLSchema)time	
	~
Type Structure:	
🖃 string	
Add Schema Cancel OK	

Figure 3.8. Edit variable in process file

- Select xsd as a namespace in the popup menu.
- Add an Assign element between the receiveInput element and replyOutput element.
- Click the Assign element in the BPEL editor in order to get the properties information of it in the Properties view.
- Set its name in the Description tab as assignHelloMesg.

In the Details section of Properties view, you should click the New button to add a copy subelement to the element. Assign "Variable to Variable"(input:string to output). At this time, an "initializer" popup dialog appears. Click on the Yes button in the dialog.

Properties								2 🗸	- 8
😑 assignHelloN	lesg								
Description	□ Validate								
Details	Variable to Varial	ible	Fr <u>o</u> m:	Variable	0	Ţo:	Variable		0
Join Behavior	Expression to Va	ariable	👄 input : str	ing		input : str	ing		
Documentation			🕨 😑 output : H	ielloResponseMessage		🕨 👄 output : H	HelloResponseMessage		
	New	Delete	Query:			Query:			
	Move Up	Move Down)	Ignore Missing	g Source Data		L Keep Source	Element Na	me

Figure 3.9. Add Assign to the process

Then you should click New once more and select Expression to Variable (assign concat(\$input,'World')) to result:string.

Properties 🛙			₫ ▽ □ 8
😑 assignHelloN	lesg		
Description	□ <u>V</u> alidate		
Details	Variable to Variable	From: Expression	<u>T</u> o: Variable
Join Behavior	Expression to Variable	Expression language: Same as Process (XPath 1.0 in BPEL 2.0)	Input : string
Documentation			▽ 😑 output : HelloResponseMessage
		concat(\$input,' World')	
		Ξ.	result : string
	New Delete		Query: tns:result
	Move Up Move Down	Ignore Missing Source Data	□ Keep
	<		>

Figure 3.10. Add Expression assign to the process

3.1.4. Adding Service to WSDL file

 Open the file "HelloWorldArtifacts.wsdl" in the "HelloWorld" project by double-clicking the file. Right-click the WSDL editor and select Add Service. A new service should appear in the editor. Name it HelloWorldProcessService. It has the Port named NewPort. Select it, right-click on it and rename it to HelloWorldProcessPort in the Properties view.

E			Java EE - HelloWor	d/HelloWord	Artifacts.ws	dl - Eclipse SDK			
<u>F</u> ile <u>E</u> dit <u>S</u> ou	rce <u>N</u> avigate	e Se <u>a</u> rch	<u>P</u> roject <u>B</u> un WSDL	Editor <u>W</u> indo	w <u>H</u> elp				
C* 🔒 🚔 100% 魚 < 际 < 🍫	* 0 · 0 · 0 · 0 · 0 · 0 · 0 · 0 · 0 · 0	9₌× 9 <u>⊾</u> ×] ⊡⊠	©;× 67×] ∅ 2	• 🛷 🥹	&] Q ×	▶ \$ \$, ⊖ ₹5		🖹 😭 Java EE 🐉 Java	»
📃 🔍 Hellowa	ord.bpel 🛛	🤋 HelloWord	Artifacts.wsdl 🕴				- 0	🗄 Outli 😫 🗖 🗖	
Ŀ								imports ▷ Imports ▷ Imports	٠
🔏 He	lloworldProce	ssService			📵 Hell	oWord		P Bindings	
	elloWorldProce	essPort		∰ process	🗆 navlaad	LiellettferdDe guest		D Port Type	
	ittp://www.exa	mpie			r payload		<u> </u>	Messages	
				4. output	s payload				
Design S	ource								
🔠 Markers	s 🔲 Propertie	es 🛛 🚜	Servers 🏙 Data Sou	irce Explorer	🗟 Snippets			₫ ▽ □ □	
⊨ port									
General	Na	ame:	HelloWorldProcessP	ort					
Documen	tation Bi	nding:						~	
Extension	Ac	dress:	http://www.example	.org/					
	Pr	otocol:	SOAP					~	
	definitions/ser	vice/port				[3041]			

Figure 3.11. Add Service to the WSDL file

 Right-click somewhere in the whitespace of the WSDL editor and select Add Binding. A new Binding component will appear in the editor. Name it HelloWorldSOAPBinding. Select it, in the General tab of the Properties view and select HelloWorld as a port type in the PortType. Then click on the Generate Binding Content... button to open the Binding Wizard. In the wizard, select SOAP as the Protocol. Finally, click the Finish button to close the wizard.

Java EE - HelloWord/HelloWordArtifacts.wsdl - Eclipse SDK	
Eile Edit Source Navigate Search Project Bun WSDL Editor Window Help	
Ē* \$* Q • ♀ • \$ * ≅ · G • ≅ Ø Ø . 9] # 9 • \$ • \$ ● > 100% ∬ • ∯ • \$ ← ↔	한 🦞 Java EE 🖏 Java 🔌
🚬 🞗 HelloWord.bpel 🖉 HelloWordArtifacts.wsdl 🕱	- 🗆 📴 outli 🕱 - 🗖 🚽
	imports ↓ is Types ↓ is Services
HelloWorldProcessService	📙 Dindings
HelloworldProcessPort HelloworldProcessPort HelloworldProcessPort HelloworldProcessPort HelloworldProcessPort HelloworldProcessPort	
U outout P payload E HellowordResponse	
	↓ ↓ process
	Messages
Design Source	
🔠 Markers 💷 Properties 🕴 🦓 Servers 🛍 Data Source Explorer 🗟 Snippets	2
binding	
General Name: HelloWorldSOAPBinding	Q
Documentation PortType: HelloWord	~
Extensions Protocol: SOAP	
Generate Binding Content	
□° initions/binding [2993] 	

Figure 3.12. Add a Binding to the WSDL file

 Click the HelloWorldProcessPort property in the General section of the Properties view, select HelloWorldSOAPBinding in the Binding combobox. In the Address field input <u>http://</u> localhost:8080/bpel/processes/HelloWorld?wsdl.

E			Java EE - HelloWor	d/HelloWord	Artifacts.ws	dl - Eclipse SDK		_	
Eile	<u>E</u> dit <u>S</u> ource <u>N</u> avi	igate Se <u>a</u> rch	Project <u>R</u> un WSDL	Editor <u>W</u> indo	w <u>H</u> elp				
] [10 0	 □ ○ ○	• 9 ≣• 0 <u>∎</u> •] • 1 • 1 • 1	©;× §;×] ⊭ ≥	<i>*</i> ≁] ⊛]	&] Q~	▶ \$ \$, ⊖ ≷5		🖹 🔁 Java EE 🖏 Java	»
_	👤 HelloWord.bpel	A HelloWord	Artifacts.wsdl 🛙				- 0	🗄 Outli 🕱 🗖 🗖	
4			_				_	imports ▷ Imports ▷ Imports	•
	🚈 HelloWorldP	rocessService	, 1		🖸 Hell	oWord	1	D C Rindings	
	HelloWorldP	rocessPort		# process	🗆 navlaad	A Lielle Word De guest			
	http://ioca	nost.8080			r payload □ payload	HellowordRequest		✓ I HelloWord	
				- output	ur payload	E Hellowordkesponse		> # process	
								Messages	
	Design Source								
):					
	Markers E Prop	erties 23 PA	Servers 📜 Data Sou	rce Explorer	Snippets				
	⊨ port								
	General	Name:	HelloWorldProcessP	ort					
	Documentation	Binding:	HelloWorldSOAPBing	ling				~	
	Extensions	Address:	http://localhost:8080)/bpel/process	es/HelloWorld?	wsdl			
		Protocol:	SOAP					~	
] □•	e definitions	/service/port				[3492]			

Figure 3.13. Add the HelloWorldSOAPBinding to the HelloWorldProcessPort

• You should also change some service part configurations. To do this, click part element in the WSDL editor, then put the following data in the Properties view.

E			va EE - HelloWord/HelloWordArtifacts.wsdl - Eclij	pse SDK	_ = ×
Eile	<u>E</u> dit <u>S</u> ource <u>N</u> avi	gate Se <u>a</u> rch	oject <u>B</u> un WSDL Editor <u>W</u> indow <u>H</u> elp		
[1 00	<mark>~ 圖 圖] 参~ 0</mark> 0% ~ 嗣~ ኈ ⇔ ↔ ↔	× @ ₌× Q _■ ×] ▼ ൽ ∼	\$* €*] @ @ / *] @] &] ?* ♦ ૠ (• %	함 🤨 Java EE 🖏 Java 🛛 »
	👤 HelloWord.bpel	A HelloWord	tifacts.wsdl 🕱	- 0	🗄 Outli 🕴 🗖 🗖
6					Imports Imp
	👗 HelloWorldPr	ocessService	Helloword		P Bindings
	HelloWorldPi	ocessPort	₩ process		P Bindings
	http://iocali	10St:8080	Minput P payload e Helk	oWordRequest	V B Port Type
			Support Payload E Held	oWordResponse	 Helloword A process
	Design Source				
	🔠 Markers 🔲 Prop	erties 🛛 🚜	ervers 🎁 Data Source Explorer 🛅 Snippets		
	■ port				
	General	Name:	HelloWorldProcessPort		
	Documentation	Binding:	HelloWorldSOAPBinding		~
	Extensions	Address:	ttp://localhost:8080/bpel/processes/HelloWorld?wsdl		
		Protocol:	SOAP		~
	e definitions	/service/port	[] []	3492]	

Figure 3.14. Configuration of service part

Now you have finished creating a simple BPEL process.As a next step, you can deploy the BPEL project to JBoss BPEL Runtime.

3.2. Deploy a JBoss BPEL project to JBoss BPEL Runtime

3.2.1. Creating a bpel-deploy.xml file

If you want to deploy a BPEL project to JBoss BPEL Runtime, you should create a bpel-deploy.xml file. JBoss tools can help you to create it:

 Create the bpel-deploy.xml by selecting New > Other... > BPEL 2.0 > Apache ODE Deployment Descriptor. Click the Next button.

O New	×
Select a wizard	*
<u>W</u> izards:	
type filter text	4
java Project	<u> </u>
❀ Java Project from Existing Ant Buildfile	
🕸 Plug-in Project	=
General	
🕴 Apache ODE Deployment Descriptor	
🖀 BPEL Project	
👷 New BPEL Process File	
Business Intelligence and Reporting Tools	~
(?) < <u>B</u> ack <u>N</u> ext > Cancel <u>Fin</u>	ish

Figure 3.15. New BPEL Deploy file

• On the next wizard page you should enter the following information:

BPEL Project: Click the Browse... button to select the BPEL project in your workspace which you want to deploy to the runtime. Please note, that you should select the bpelContent folder in your new BPEL project as a value of BPEL Project field because the bpel-deploy.xml should be created in this place.

File name: The default value is bpel-deploy.xml. Please, don't change it.

Click on Finish button to close the wizard and a new bpel-deploy.xml file will be created.

0		×
Apache ODE	Deployment Descriptor	
This wizard c that the file n	reates a new Apache ODE descriptor file (bpel-deploy.xml). Note ame cannot be changed.	
BPEL <u>P</u> roject:	/HelloWorld/bpelContent	Browse
<u>F</u> ile name:	[bpel-deploy.xml	
?	< <u>B</u> ack <u>N</u> ext > Cancel	Einish

Figure 3.16. New BPEL Deploy file Wizard

 Double-click the bpel-deploy.xml file to open it in ODE Descriptor Deployment Editor. In the Inbound Interfaces section, click the Associated Port column and select HelloWorldProcessPort in the dropdown box.The Related Service and Binding Used columns should be automatically filled in. Save the *bpel-deploy.xml*.

		Web - HelloWorld/I	bpelContent/bpel-deploy.	xml - Eclipse		
<u>E</u> dit <u>N</u> avigate Se <u>a</u> rcl	h <u>P</u> roject <u>R</u> un <u>W</u> indo	ow <u>H</u> elp				
🖩 🗟 🗁 🛛 🍫 🕻	> &] 🗠 🖉	~] 🛛] 🗗 😭 🛽	፻ │ ₄ │ ⊆∽│ ♦ 株	● ⑧] 월 ~ 월 ~ 🏷	⇔ • ⇔•	🖹 🮯 Web 📌 Java EE
HelloWorld.bpel	१ *bpel-deploy.xml ध					-
👤 Process Hello	World - http://ecl	ipse.org/bpel/sa	ample			
✓ General						
This process is activ	vated 🗘					
 Run this process in 	memory					
 Inbound Interfac 	es (Services)					
The table contains inte	erfaces the process prov	vides. Specify the se	rvice, port and binding you	1		
Partner Link Assoc	iated Port	Related Service	Binding Used	1		
client HelloWe	orldPort vittp://eclips	e.org/bpel/sample}H	elloWorldBinding	1		
				1		
				_		
- Outbound Interfa	aces (Invokes)					
Outbound Interfa The table contains inte	aces (Invokes) erfaces the process invo	okes. Specify the ser	vice, port and binding you			
Outbound Interfa The table contains intervant to use for each P Partner Link Associa	aces (Invokes) erfaces the process invo artnerLink listed ated Port Related Servic	okes. Specify the ser	vice, port and binding you	1		
Outbound Interfa The table contains inter want to use for each P Partner Link Associa	aces (Invokes) erfaces the process invo PartnerLink listed Ited Port Related Servic	okes. Specify the ser	vice, port and binding you nding Used			
Outbound Interfa The table contains inter want to use for each P Partner Link Associa	aces (Invokes) erfaces the process invo artnerLink listed ted Port Related Servic	okes. Specify the ser	vice, port and binding you nding Used			
Outbound Interfa The table contains into want to use for each P Partner Link Associa Process-level Mo	aces (Invokes) erfaces the process invo artnerLink listed ted Port Related Servic entoring Events	okes. Specify the ser	vice, port and binding you nding Used			
Outbound Interfa The table contains into Want to use for each P Partner Link Associa Process-level Mo None All	aces (Invokes) erfaces the process invo artnerLink listed ted Port Related Service initoring Events	okes. Specify the ser	vice, port and binding you nding Used			
Outbound Interfa The table contains into Want to use for each F Partner Link Associa Process-level Mo None All Selected	aces (Invokes) erfaces the process invo artnerLink listed ted Port Related Service initoring Events Instance life Activity life c Data handiin	okes. Specify the ser	vice, port and binding you nding Used			
Outbound Interfa The table contains into Want to use for each F Partner Link Associa Process-level Mo None All Selected	aces (Invokes) erfaces the process invo artnerLink listed ted Port Related Service initoring Events Instance life Activity life c Data handlin Scope handli	cycle cycle rgg	vice, port and binding you nding Used			
Outbound Interfa The table contains into Want to use for each F Partner Link Associa Process-level Mo None All Selected	aces (Invokes) erfaces the process invo artnerLink listed ted Port Related Service initoring Events Activity life c Data handlin Scope handli Correlation	okes. Specify the ser ce Bir cycle cycle g ng	vice, port and binding you nding Used			
Outbound Interfa The table contains into want to use for each F Partner Link Associa Process-level Mo None All Selected Scope-level Moni	aces (Invokes) erfaces the process invo artnerLink listed ted Port Related Servic nitoring Events Instance life Activity life o Data handlin Scope handli Correlation	cycle cycle ing	vice, port and binding you nding Used			
Outbound Interfa The table contains into want to use for each F Partner Link Associa Process-level Mo None All Selected Scope-level Moni Scope Instance life of	aces (Invokes) erfaces the process invo artnerLink listed ted Port Related Service initoring Events Instance life Activity life of Data handlin Scope handli Correlation Instance Life Data handlin Scope handli Correlation	okes. Specify the ser ce Bir cycle cycle ig ing Data handling Scor	vice, port and binding you nding Used			
Outbound Interfa The table contains into want to use for each F Partner Link Associa Process-level Mo None All Selected Scope Instance life of	aces (Invokes) erfaces the process invo artnerLink listed ited Port Related Service initoring Events Instance life Activity life of Data handlin Scope handli Correlation Correlation Sycle Activity life cycle	okes. Specify the ser ce Bir cycle cycle ig ing Data handling Scop	vice, port and binding you nding Used			
Outbound Interfa The table contains into want to use for each F Partner Link Associa Process-level Mo None All Selected Scope Instance life contains	aces (Invokes) erfaces the process invo artnerLink listed ited Port Related Servic initoring Events Instance life Activity life of Data handlin Scope handli Correlation Correlation Sycle Activity life cycle	okes. Specify the ser ce Bir cycle cycle ing ing Data handling Scop	vice, port and binding you nding Used			
Outbound Interfa The table contains into want to use for each F Partner Link Associa Process-level Mo None All Selected Scope Instance life contains -telloWorld	aces (Invokes) erfaces the process invo artnerLink listed ited Port Related Servic initoring Events Instance life Activity life of Data handlin Scope handli Correlation Correlation Activity life cycle	okes. Specify the ser ce Bir cycle cycle ig ing Data handling Scop	vice, port and binding you nding Used			

Figure 3.17. bpel-deploy.xml file editor

3.2.2. Creating JBoss BPEL Server

Suppose you have installed the JBoss BPEL Runtime-RiftSaw as it was described <u>before</u>, now you can create a server for JBoss BPEL runtime.

- Open the Servers view by selecting Windows > Show View > Other... > Server > Servers.
- Right-click the Servers view and select *New > Server* to open the New Server Wizard:

0	New Server
Define a New Server	
Choose the type of server to o	create
	Download additional server adapters
Select the <u>s</u> erver type:	
type filter text	4
👂 🗁 JBoss	<u>^</u>
🗢 🗁 JBoss Community	
JBoss AS 3.2	
JBoss AS 4.0	_
JBoss AS 4.2	
JBoss AS 5.0	
🕻 JBoss AS 5.1	
🕻 JBoss AS 6.0	▼
JBoss Application Server 5.1	
Converts hest name:	lasalhast
server's <u>n</u> ost name.	localnost
Server na <u>m</u> e:	JBoss 5.1 Runtime Server (1)
Server runtime environment:	JBoss 5.1 Runtime
	Configure runtime environments
< <u>B</u> a	ck <u>N</u> ext > Cancel <u>F</u> inish

Figure 3.18. New Server Wizard

• Select JBoss AS 5.1 as a server type.



• Click the Next button. On the next page, you should input your *JBoss As* location. Then click the Next button and you will get the page like this:

0	Add and Remove	×
Add and Remove Modify the resources that are co	nfigured on the server	
Move resources to the right to co	nfigure them on the server	
<u>A</u> vailable:	<u>C</u> onfigured:	
 ★ HelloWorld ☆ helloworld-v0 ☆ riftsaw-193 	A <u>d</u> d > < <u>R</u> emove	
	Add All >>	
✓ If server is started, publish ch	anges <u>i</u> mmediately	
? < <u>B</u> ack	<u>N</u> ext > Cancel <u>Finish</u>	

Figure 3.19. Add resource to the server

• Select HelloWorld, then click the Add button to add the project to the server. Then click on the Finish button.

Start the server by right-clicking on the server and selecting the Start item.

🖹 Problems 🦗 Servers 🕱 🔲 Properties	莎	0	Ď		1	~	
🔻 ဦ JBoss 5.1 Runtime Server [Stopped]							
👷 HelloWorld							
🚊 org.jboss.ide.eclipse.archives.webtools.filesets.FilesetContentProvider\$ServerWrap	er@	f7d5	d307				
▷ 🕅 org.jboss.ide.eclipse.as.ui.views.server.extensions.XPathTreeContentProvider\$Serve	rWra	pper	@f7	d5d3	07		
🕨 🔓 Tomcat v5.5 Server at localhost [Stopped]							
🕨 🔓 Tomcat v6.0 Server at localhost [Stopped]							
							_

Figure 3.20. The started server

If some aspects of server creation is not clear, please, read <u>JBoss Server Manager Reference</u> <u>Guide</u> [http://download.jboss.org/jbosstools/nightly-docs/en/as/html_single/index.html] for more details.

• You can enter the link <u>http://localhost:8080/bpel/processes.html</u> to the browser to get the deployed processes.



Figure 3.21. The BPEL console

If there's anything we didn't cover or you can't figure out, please feel free to visit our <u>JBoss</u> <u>Tools Users Forum</u> [http://www.jboss.com/index.html?module=bb&op=viewforum&f=201] to ask questions. There we are also waiting for your suggestions and comments.

Reference

This chapter includes detailed reference information about all BPEL tools wizards and editors.

4.1. Wizards

4.1.1. New BPEL project Wizard

This wizard helps to create new BPEL project. It is available with clicking File->New->Other->BPEL project in the menu bar.

E New	×
Select a wizard	>
Create a new BPEL project.	
<u>W</u> izards:	
type filter text	
😂 Plug-in Project	^
🕨 🗁 General	
▽ 🗁 BPEL 2.0	
🖇 Apache ODE Deployment Descriptor	
💕 BPEL Project	
≳ New BPEL Process File	
Business Intelligence and Reporting Tools	
🕨 🗁 Choreography	
Connection Profiles	~
(?) < Back Next > Cancel	Einish

Figure 4.1. New BPEL Project Wizard

It consists of only one page:

• On the page you can adjust the name of the project and the directory where it will be created.

If "Use default" option is checked the output directory will be the workspace, othervise the user should specify it by himself using Browse button.

E	New BPEL Project	×
New BPEL 🙆 A Link loc	. Project cation must be specified.	
Project nar Project con Use <u>d</u> e Directory:	me: BPEL_hello ntents- efault	Browse
?	< <u>B</u> ack Next > Cancel	Einish

Figure 4.2. New BPEL Project Wizard

4.1.2. Apache ODE Deployment Descriptor Wizard

Using this wizard user can create ODE deployment descriptor (deploy.xml) and place it in the temporary directory.It is available with clicking File->New->Other->Apache ODE Deployment Descriptor Wizard in the menu bar.

E		×
Apache ODE	Deployment Descriptor	
This wizard cr Note that the	eates a new Apache ODE descriptor file (bpel-deploy.xml). file name cannot be changed.	
BPEL <u>P</u> roject:	/BPEL_hello/bpelContent	Browse
<u>F</u> ile name:	bpel-deploy.xml	
	·	
?	< Back	Einish

Figure 4.3. New BPEL Project Wizard

On the page you can adjust the name of the deployment descriptor and the directory where it will be created.Note,that you should use /PROJECT_NAME/bpelContent directory as an output one.

4.1.3. New BPEL Process file Wizard

Using New BPEL Process file Wizard user can create BPEL process file and WSDL file if it is necessary. The wizard includes several pages:

• The first page has the following options to set:

Option	Description	Default
Name	Enter the process name.	no default value
Namespace	Enter the namespace url here	no default value
Template	 Select one of the provided templates: Asynchronous BPEL Process - generates the basis of orchestration logic: receive and reply activities are included into the process; client WSDL is generated, service is defined in the parentlink of the process. The caller is notified asynchronously when the process completes. 	Asynchronous BPEL Process

Table 4.1. New BPEL Process file Wizard. First Page Options.

Option	Description	Default
	 <i>Empty BPEL Process</i> - list of services participating in this BPEL process together with the one of messages used within the process is empty. There are no any orchestration logic. <i>Synchronous BPEL Process</i> - similar to Asynchronous BPEL Process template except the fact that here the caller is notified synchronously when the process completes. 	
Abstract Process	Specifies the created process as an abstract one - partially specified processes that are not intended to be executed.	unchecked

0	New BPEL Process	×
Create a BPEL Proce	ess File	\wedge
Create a 2.0 BPEL file.		Ľ,
Process Details		
BPEL Process Name:		
Namespace:		~
Template:	Asynchronous BPEL Process	
Generates an empty E process body. The call performed by the BPE process completes. A	BPEL process. Only receive and reply activities are placed er will resume execution as soon as the receive activity i L process. The caller will be notified asynchronously when client interface is generated	in the s n the
?	< <u>B</u> ack <u>N</u> ext > Cancel <u>E</u> i	nish

Figure 4.4. New BPEL Process file Wizard

• On the second page the user should select the BPEL project and folder where the process file will be created:

New BPEL Process	×
Select Files Location	
Select location for the BPEL source files.	¥,
Select Project or Folder for the BPEL files.	
マ 🗁 HelloWorld	<u>_</u>
Settings	=
🕨 🗁 bpelContent	
JBT-trunk-documentation-whatsnew-bpel	
RemoteSystemsTempFiles	
Servers	
🕨 🗁 bpel	
▷ 🗁 bpel.esb	
▶ 🚔 deplover	~
(?) < Back Next > Cancel	Finish

Figure 4.5. New BPEL Process file Wizard



4.2. Editors

4.2.1. Business Process Editor

Business Process Editor is intended to facilitate the process of changing and adding new logic to BPEL process file.You can open *.bpel* in this editor by right click the file in the project explorer and selecting Open With...->Business Process Editor



Figure 4.6. Business Process Editor

The editor consists of two tabs:Design tab and Source tab.

4.2.1.1. Design tab

Design tab is the main part of Business Process Editor. It consists of 3 parts:

• Visual Pane:



Figure 4.7. Visual Pane of Business Process Editor

The Visual Pane graphically displays the order in which the activities are executed.

• Palette:



Figure 4.8. Palette of Business Process Editor

The Palette represents different elements of the BPEL activities organized into functional categories. Using it the user can easily add new elements to the sequence activity. To do this,he should just click the required element and then drug and drop it to the place on the Visual Pane where it should be added.

• Behavior Components View:



Figure 4.9. Behavior Components View of Business Process Editor

Execution behavior components are grouped into the Behavior Components View. The view is also fully syncronized with Properties view where you can customize all the properties of the component.

⊇Helloworld.bpel Σ	3			- 8
Design Source	Sequence start signHelloMesg end		Palette Palette Palette Control2 f Faults Zoom In OZoom Out	 ☆ HelloWorld ☆ Partner Links * * helloPartnerLink Variables * * myVar mesgVar ☆ Correlation S * * ☆ Message Exc * *
myVar Description Details Initialization Documentation	N <u>a</u> me:	myVar		

Figure 4.10. Process Structure View of Business Process Editor

To add an element to some component group click plus(

icon, for its deleting you should click the element and use its Delete option in the popup menu.

4.2.1.2. Source tab

Source tab can be used for editing BPEL process file directly. The validation of file structure is also available.

)



Figure 4.11. Validation error in Source tab

If the user wants to disable/unable validation he can do it by following Window->Preferences->Validation.

E		Preferences			
		Validation			\$~ \$~ -
Þ	General				
A A A A A	Agent Controller Ant BPEL Choreography Data Manageme	 Allow projects to <u>o</u>verride these projects to <u>o</u>verride these projects to <u>o</u>verride these projects Suspend all validators Save all modified resources autor Show a <u>c</u>onfirmation dialog when the selected <u>validators will run when the selected validators will run when the selected v</u>	reference natically p performine validation	setting rior to g manu is perfe	is validating ual validations ormed:
V	Drools Task	Validator	Manual	Build	Settings
	FreeMarker Editc	Application Client Validator BPEL Validator	V	V V	
⊳	Help	Classpath Dependency Validator			_
	HQL editor	Connector Validator			
Þ	Install/Update	DTD Validator			
⊳	Java	EAR Validator			
	Java EE	EJB Validator			
Þ	JBoss jBPM	HTML Syntax Validator			
⊳	JBoss Tools	JavaScript Syntax Validator			
⊳	Maven	JBoss KB Project Validator			
⊳	Plug-in Developr	JPA Validator			
⊳	Profiling and Log	jPDL 4 Validator			
	Project Archives	JSF2 Components Validator			
Þ	Report Design	JSF Application Configuration Validat	0 🗹		··· •
Þ	Run/Debug	Enable All Disable All			
Þ	Server				
×	Toom V	F	lestore <u>D</u> e	faults	Apply
(?		Cance		ок

Figure 4.12. Validation configuration

4.2.2. ODE Deployment Descriptor Editor

To deploy your process in Ode you need to create a simple deployment descriptor with basic information and ODE Deployment Descriptor Editor facilitates the process of descriptor configuration. You can see how the descriptor file,opened in the editor looks like on the picture below:

bpel-deploy.xml	R			
Process H	elloWorld - h	ttp://www.jboss.o	org/bpel/examples	
General				
This process is	activated 🗘			
] Run this proce	ess in memory			
Inbound Inte	rfaces (Service)	5)		
he table contain each PartnerLink	s interfaces the p listed	rocess provides. Specify	the service, port and binding yo	u want to use for
Partner Link	Associated Port	Rela	ted Service	Binding Used
helloPartnerLink	HelloPort	{http://www.jboss.org/bp	el/examples/wsdl}HelloService	HelloSoapBinding
Outbound Inf he table contain ach PartnerLink	terfaces (Invoke is interfaces the p listed	es) rocess invokes. Specify	the service, port and binding you	uwant to use for
• Outbound Int he table contain each PartnerLink Partner Link As	terfaces (Invoke is interfaces the p listed sociated Port Rel	es) rocess invokes. Specify ated Service	the service, port and binding you Binding Used	u want to use for
Outbound Inf the table contain each PartnerLink Partner Link As Process-leve	terfaces (Invoke is interfaces the p listed sociated Port Rel I Monitoring Eve	es) rocess invokes. Specify ated Service	the service, port and binding you Binding Used	u want to use for
Outbound Inf he table contain each PartnerLink As Partner Link As Porcess-leve O None	terfaces (Invoke is interfaces the p listed sociated Port Rel I Monitoring Eve	es) rocess invokes. Specify ated Service ents stance life cycle	the service, port and binding you Binding Used	u want to use for
Outbound Inf the table contain each PartnerLink As Partner Link As Process-leve None All	terfaces (Invoke is interfaces the p listed sociated Port Rel I Monitoring Eve Ac	es) rocess invokes. Specify lated Service ents stance life cycle stivity life cycle	the service, port and binding you Binding Used	u want to use for
Outbound Inf he table contain each PartnerLink As Partner Link As Process-leve None All Selected	terfaces (Invoke is interfaces the p listed sociated Port Rel I Monitoring Eve Ac Ac D	es) rocess invokes. Specify lated Service ents stance life cycle stivity life cycle ata handling	the service, port and binding you Binding Used	u want to use for
Outbound Inf the table contain each PartnerLink As Partner Link As Process-leve None All Selected	terfaces (Invoke is interfaces the p listed sociated Port Rel I Monitoring Eve Action Action Sociated Social Social Social Social Socia	es) rocess invokes. Specify lated Service ents stance life cycle ata handling cope handling	the service, port and binding you Binding Used	u want to use for
Outbound Inf he table contain each PartnerLink As Partner Link As Process-leve None All Selected	terfaces (Invoke is interfaces the p listed sociated Port Rel I Monitoring Eve Action Sociated Content Sociated Port Content Sociate	es) rocess invokes. Specify lated Service ents stance life cycle stivity life cycle ata handling cope handling prrelation	the service, port and binding you Binding Used	u want to use for
Outbound Inf he table contain each PartnerLink As Partner Link As Process-leve None All Selected	terfaces (Invoke is interfaces the p listed sociated Port Rel I Monitoring Even Acc Sociated Port Rel Content Sociated Por	es) rocess invokes. Specify lated Service ents stance life cycle stivity life cycle ata handling cope handling prrelation	the service, port and binding you Binding Used	u want to use for
Outbound Inf the table contain each PartnerLink As Partner Link As Process-leve None All Selected Scope-level I Scope Instance	terfaces (Invoke is interfaces the p listed sociated Port Rel I Monitoring Even Activity Monitoring Even	es) rocess invokes. Specify lated Service ents stance life cycle ata handling cope handling prrelation tts vife cycle Data bandling	the service, port and binding you Binding Used	u want to use for
Outbound Inf the table contain sach PartnerLink As Partner Link As Process-level None All Selected Scope Instance	terfaces (Invoke is interfaces the p listed sociated Port Rel I Monitoring Even Activity Iffe cycle Activity	es) rocess invokes. Specify lated Service ents stance life cycle ata handling cope handling prrelation tts v life cycle Data handling	the service, port and binding you Binding Used	u want to use for

Figure 4.13. ODE Deployment Descriptor Editor

The table below describes the configuration options of the ODE Deployment Descriptor Editor:

Table 4.2. ODE De	ployment Descript	tor Editor.Options.

Section	Options	Description
	This process is	Select one of the provided options:
General		 activated
		deactivated
		• retired

Section	Options	Description
	Run this process in memory	for performance purposes, you can define the process as being executed only in- memory.
Inbound Interfaces(Service Outbound Interfaces(Invokes	Associated Port s) Associated Port	Click Associated Port and the dropdown list with all available port names will appear. Select the one you need ,other fields will be filled automatically. This action configure the services provided by the process and bind each service to an endpoint Click Associated Port and the dropdown list with all available port names will appear. Select the one you need, other fields will be filled automatically. This action configure the services invoked by the process
Process-level Monitoring Events	 None All Selected: 	Using ODE's deployment descriptor, it's also possible to make events

Section	Options	Description
	 Instance life cycle Activity life cycle Data handling Scope handling Correlation 	generation to filtrate which ones get created. All option just duplicates the default behaviour, when nothing is specified in the deployment.
Scope-level Monitoring Events	Scope	This section makes it possible to define filtering for each scope of your process.

Summary

In conclusion, with this document you know all the capabilities of BPEL Tools and could easily start with them. The chapters above walked you through the steps on how to create and configure BPEL process and deployment descriptor files. If you have questions or suggestions concerned both the documentation and tools behavior, you are welcome to JBoss Tools Users forum. Please, use Jira to report bugs and requests on documentation.

5.1. Other relevant resources on the topic

All JBoss Developer Studio/JBoss Tools release documentation you can find at <u>http://</u> <u>docs.jboss.org/tools</u> in the corresponding release directory.

The latest documentation builds are available at <u>http://download.jboss.org/jbosstools/nightly-docs</u>.