PEtALS-BC-SOAP

This document explains how to install, configure and use the petals-bc-soap JBI component.

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PETALS-BC-SOAP

This binding component allows to interact with external Web Services and to expose JBI services as Web Services.

A JBI `MessageExchange` sent to a ServiceEndpoint (mapped to a Web Service) is transformed into a SOAP message and sent to the linked external web service. A SOAP message received on an exposed web service is transformed into a JBI MessageExchange and sent to the corresponding JBI ServiceEndpoint.

If you want more details about SOAP, you can consult this W3C specification : http://www.w3.org/TR/soap/

Chapter 1. Features

The petals-bc-soap is based on the petals-cdk v3.0, Apache Axis2 v1.3 and Mortbay Jetty v6.1.4. It provides support of :

- Expose JBI Services as Web Services
- Expose Web Services as JBI Services
- Handle SOAP attachments. The attachments of the incoming SOAP message are placed into the JBI message as attachments; the JBI attachments are placed in the outgoing SOAP message as attachments.
- WS-notification. The component can send web service notifications to external subscribers.
- WS-Security and WS-SecureConversation via the addition of the Rampart's Axis2 module.

Chapter 2. Component Configuration

The component can be configured through its JBI descriptor file like this :

```
<?xml version="1.0" encoding="UTF-8"?>
<jbi:jbi xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
 xsi:schemaLocation="http://java.sun.com/xml/ns/jbi ../schema/jbi/standardPetals.xsd"
 xmlns:petals="http://petals.objectweb.org/extensions"
 xmlns:jbi="http://java.sun.com/xml/ns/jbi"
 xmlns:foo="http://www.foo.com/ns/bar" version="1.0">
 <jbi:component type="binding-component" bootstrap-class-loader-delegation="parent-first">
  <jbi:identification>
   <jbi:name>petals-bc-soap</jbi:name>
   <jbi:description>The SOAP Binding Component (based on Axis2 + Jetty)</jbi:description>
  </jbi:identification>


 <jbi:component-class-name>org.objectweb.petals.binding.soap.SoapComponent</jbi:component-class-
name>
  <jbi:component-class-path />

 <jbi:bootstrap-class-name>org.objectweb.petals.binding.soap.SoapBootstrap</jbi:bootstrap-class-
name>
  <jbi:bootstrap-class-path></jbi:bootstrap-class-path>

  <petals:pool-size>10</petals:pool-size>
  <petals:ignored-status></petals:ignored-status>


 <petals:jbi-listener-class-name>org.objectweb.petals.binding.soap.listener.outgoing.JBIListener</
petals:jbi-listener-class-name>

 <petals:external-listener-class-
name>org.objectweb.petals.binding.soap.listener.incoming.SoapExternalListener</petals:external-
listener-class-name>

  <petals:component-interceptors/>

  <petals:properties-file/>

  <petals:params>
   <petals:param name="http.port">8084</petals:param>
   <petals:param name="http.services.list">true</petals:param>
   <petals:param name="http.thread.pool.size.min">1</petals:param>
   <petals:param name="http.thread.pool.size.max">255</petals:param>
   <petals:param name="http.acceptors">4</petals:param>
  </petals:params>
 </jbi:component>
</jbi:jbi>
```

This component is also configurable through JMX during its installation phase. Please refer to the JMX configuration manual for more information.

Table 2.1. Component installation configuration attributes

Attribute	Description	Default	Required
http.port	The port used by the Jetty HTTP server to handle incoming http requests	8084	No
http.services.list	Display the list of exposed services	true	No
http.thread.pool.size.min	Minimun size of the Jetty HTTP server thread pool	1	No
http.thread.pool.size.max	Maximun size of the Jetty HTTP server thread pool	255	No
http.acceptors	Number of Jetty HTTP acceptors	4	No
http.services.context	Context of the exposed services	petals	No
http.services.mapping	Mapping of the exposed services	services	No

More information about Jetty tunning can be found here.

Table 2.2. Advanced configuration of the component

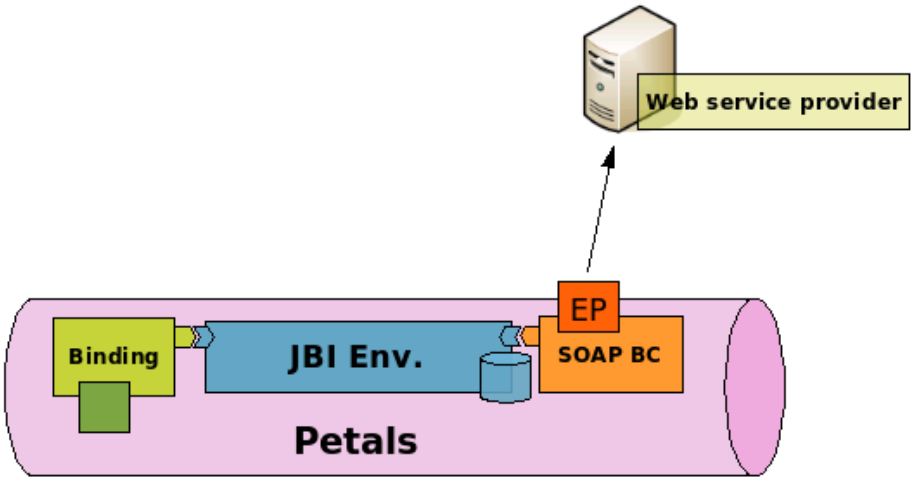
Parameter	Description	Default	Required
pool-size	Number of threads listening to messages coming from the JBI container (JBIListeners). Int number >= 1	0	No
ignored-status	Status of messages exchanges that component must ignore. Accepted values : **DONE_AND_ERROR_IGNORED**, **DONE_IGNORED**, **ERROR_IGNORED** or **NOTHING_IGNORED**	DONE_AND_ERROR_IGNORED	No
jbi-listener-class-name	Fully qualified name of the class extending **AbstractJBIListener**		Yes
external-listener-class-name	Fully qualified name of the class extending **AbstractExternalListener**		No
properties-file	Name of the file containing values of keys used as reference by other parameters. To be able to configure a service-unit, you will use a key that has its value hosted by the component (ie. CDK documentation). The value of this parameter is : • whether an URL, • or a file relative to the directory defined by the environment variable PETALS_HOME.		No

Chapter 3. Service Configuration

3.1. Send a JBI message to an external Web Service

PROVIDE SERVICE : Expose an external Web Service in the JBI environment

Figure 3.1. Provides an external Web Service as a JBI service



The petals-bc-soap component can expose an external Web Service as a JBI ServiceEndpoint. This is done by deploying a Service Unit on it (see Figure 3.1, “Provides an external Web Service as a JBI service”).

When a message is received on a SOAP linked endpoint from the JBI environment, it is transformed into a SOAP message and sent to the Web Service. The address of the Web Service to send the SOAP message to is defined in the address extension of the deployed Service Unit.

The SOAP message is created like this :

- The JBI message payload is wrapped in the SOAP body
- The JBI message attachments are used to create SOAP ones
- The JBI message exchange operation is used to create the SOAP action
- The JBI MEP is used to determine the SOAP MEP

The external Web Service is called and the SOAP response is processed and returned to the JBI environment.

3.1.1. Service Unit descriptor

The Service Unit descriptor file (`jbi.xml`) looks like this :

```
<?xml version="1.0" encoding="UTF-8"?>
<jbi:jbi version="1.0"
 xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
 xmlns:soap="http://petals.ow2.org/extensions"
 xmlns:jbi="http://java.sun.com/xml/ns/jbi"
 xmlns:petals="http://petals.ow2.org/">

 <jbi:services binding-component="true">
  <jbi:provides interface-name="soap1"
```

```
   service-name="soap1"
   endpoint-name="soap1">
   <soap:wsdl>http://localhost:8080/axis2/services/HelloworldService?wsdl</soap:wsdl>

   <soap:params>
    <soap:param name="address">http://localhost:8080/axis2/services/HelloworldService</soap:param>
   </soap:params>
  </jbi:provides>
 </jbi:services>
</jbi:jbi>
```

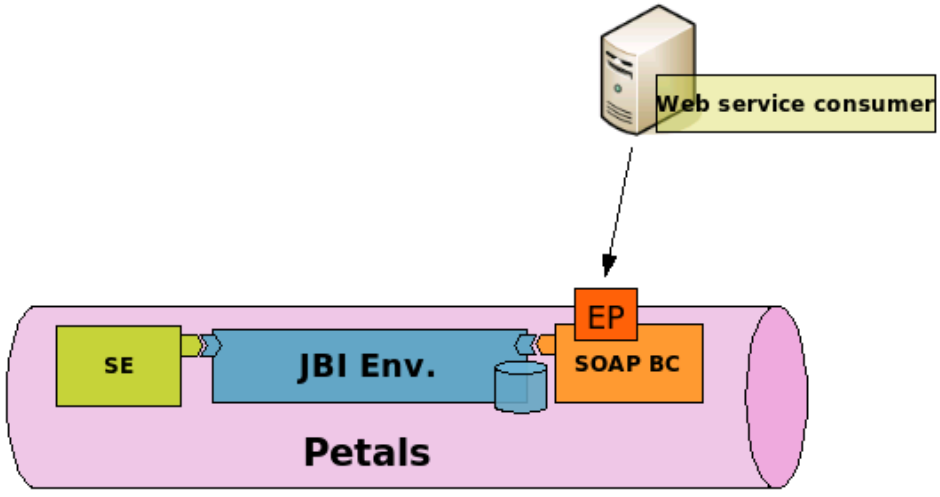
Table 3.1. Service Unit attributes to provide services

Attribute	Description	Default	Required
provides	Name of the JBI service that will be activated to expose the Web Service into the JBI environment. interface (qname), service (qname) and endpoint (string) name are required.		Yes
address	Address of the external Web Service to send JBI messages to.		Yes
soap-version	The SOAP version to be used to create SOAP messages. Possible values are "11" and "12".	11	No
timeout	The timeout value. Client will time out after waiting this amount of time. The value is expressed in milliseconds.	2000	No
proxy-host	The proxy host name. If it has not been set, the proxy mode will be disabled.		No
proxy-port	The proxy host port.	-1	No
proxy-user	The proxy user.		No
proxy-password	The proxy password.		No
proxy-domain	The proxy domain.		No
cleanup-transport	Cleanup the transport afetr the WebService call. Not cleaning up the transport can cause timeouts on large number of calls.	true	No

3.2. Send a JBI message from an incoming SOAP message

CONSUME SERVICE : Expose an internal service outside of the JBI environment

Figure 3.2. Consumes a JBI service on SOAP message



The petals-bc-soap component can listen incoming SOAP messages and send messages to a JBI ServiceEndpoint. We say that the component consumes the JBI service (see Figure 3.2, “Consumes a JBI service on SOAP message”).

To expose a JBI service as Web Service, you need to deploy a service unit. The address extension value will be used as Axis2 Service name.

When a SOAP message is handled by the Axis2 Service, it is transformed into a JBI Message and sent to the JBI ServiceEndpoint configured in the Service Unit. The JBI message is created like this :

- The JBI operation is created from the SOAP action.
- Copy the SOAP body into the JBI one.
- Put the SOAP attachments into JBI ones.
- Put the SOAP header into the "SOAP.HEADER" JBI message property

The component is configured to handle URIs with the *http://HOST:PORT/petals/services/ADDRESS* pattern. It also handles ?wsdl calls; the wsdl description is retrieved from the endpoint and sent back to the consumer.

Caution

If the service does not provide a WSDL file; the component switch to a dirty mode and always considers that the requested service implements the requested operation. Then, It's the "JBI" container or the service itself which is in charge of verifying that this operation if actualy available.

The list of services is available at *http://HOST:PORT/petals/services/listServices* URI.

3.2.1. Service Unit descriptor

The Service Unit descriptor file (`jbi.xml`) looks like this :

```
<?xml version="1.0" encoding="UTF-8"?>
<jbi:jbi version="1.0"
 xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
 xmlns:soap="http://petals.ow2.org/extensions"
 xmlns:jbi="http://java.sun.com/xml/ns/jbi"
 xmlns:petals="http://petals.ow2.org/">

 <jbi:services binding-component="true">
  <jbi:consumes interface-name="soap1"
   service-name="soap1"
   endpoint-name="soap0">

   <soap:mep>InOut</soap:mep>
   <soap:operation>sayHello</soap:operation>
   <soap:timeout>0</soap:timeout>

   <soap:params>
    <soap:param name="address">myWS</soap:param>
   </soap:params>

  </jbi:consumes>
 </jbi:services>
</jbi:jbi>
```

SOAP communication attributes :

Table 3.2. service-unit attributes to consume services

Attribute	Description	Default	Required
consumes	Name of the JBI service that will be called into the JBI environment. Only the interface (qname) name can be provided (the container will choose a ServiceEndpoint for this interface), or you can only set service (qname) and endpoint (string) names, without the interface name.		Yes
address	The name of the exposed Axis2 Web Service. This service is created and linked to the JBI context. Each SOAP message received on this service will be forwarded to the JBI endpoint.		Yes
modules	A list of Axis2 modules names (separated by comas) to be engaged on Web Service calls. These modules must be available in the component context. See managed bootstrap section for more details.		No
service-parameters	Additional XML configuration for created Axis2 service. See example in previous code snippet.		No

Table 3.3. Advanced configuration of Service Unit (consumes elements)

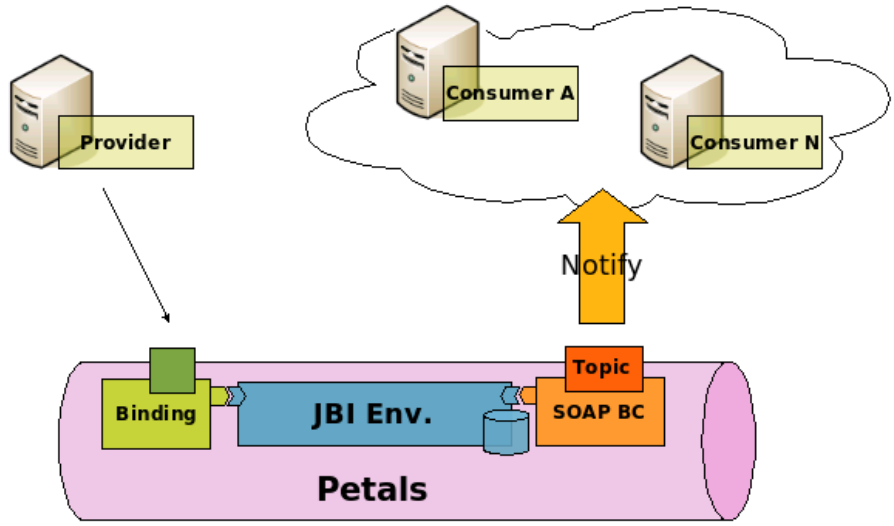
Parameter	Description	Default	Required
mep	Message exchange pattern abbreviation. This parameter can be user in conjunction with a method of the CDK Listeners : **createMessageExchange(Extensions extensions)**. This method returns a CDK Exchange corresponding to the type of the specified pattern. Admitted values are : **InOnly**, **RobustInOnly**, **InOptionalOut** et **InOut**		Yes
operation	Operation to call on a service. This parameter can be used in conjuntcion with the sendXXX methods of the Listeners. If no operation is specified in the MessageExchange to send, this parameter will be used.		Yes
timeout	Timeout in milliseconds in a synchronous send. this parameter can be used in conjunction with the **sendSync(Exchange exchange)** method of the Listeners. With this, a synchronous send is done with this timeout value. 0 for no timeout int number > 0 for a timeout	0	No
org.ow2.petals.routing.strategy	**To be used only in platform (distributed) PEtALS distribution**. Two kind of strategy can be defines: highest or random. The others parameters represents respectively the local ponderation, the ponderation of the remote active endpoint and the ponderation of the remote inactive endpoint. The 'random' strategy chooses an endpoint in function of defined ponderations. The endpoints that have the strongest ponderation can be more easely choose in comparison with the others. The 'highest' strategy chooses the first endpoint in the list that have the strongest ponderation.		No
org.ow2.petals.transporter.compress	**To be used only in platform (distributed) PEtALS distribution**. When large and redondant information is contained in the payload of a MessageExchange, it can be interestting to compress the payload to reduce the volume of data to transfer between two PEtALS nodes. Values are `true` or `false`. True activated the compression of the messages payload.	false	No
org.ow2.petals.messaging.consumer.ack	All JBI exchanges end by a message containing a `DONE` or `ERROR` status. The consumer must accept those messages, otherwise they are accumulated in the NMR. With this parameter , they can be ignored to reduce the PEtALS bus traffic. Possible values are `true` or `false`. Setting a true value makes the PEtALS container ignoring acknowlegment messages addressed to the deployed SU. **This feature is unactivated when using synhronous sends.**		No
org.ow2.petals.transporter.qos	**To be used only in platform (distributed) PEtALS distribution**. This property set up the policy of the Quality of Service supported by Petals Transporter. Possible values are : reliable, fast. If not specified, the reliable policy is selected by default.		No

Chapter 4. Web Service notifications

4.1. Intoduction

The petals-bc-soap offers a Web Service Notification feature. It works as :

Figure 4.1. Handling Web Service notifications



WS-N is a family of related specifications that define a standard Web Service approach to notification using a topic-based publish/subscribe pattern. You can get the WS-N specification here.

As defined in the WS-N specification, each notification consumer must subscribe to the notification producer to receive notification messages. In PEtALS, a topic is linked to a JBI endpoint. Each time that a message is received on this endpoint, a notification message will be sent to notification WS consumers (see Figure 4.1, “Handling Web Service notifications”).

4.2. Create a WS-N topic

To create a WS-N topic, you need to deploy a service unit with a specific address format:

```
<jbi:jbi version="1.0"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns:petals="http://petals.objectweb.org/"
  xmlns:extensions="http://petals.objectweb.org/extensions/"
  xmlns:jbi="http://java.sun.com/xml/ns/jbi">

  <jbi:services binding-component="false">
    <jbi:provides interface-name="petals:TopicInterface"
      service-name="petals:TopicService"
      endpoint-name="TopicEndpoint">

      <extensions:params>
         <extensions:param name="address">topic:TopicSample</extensions:param>1
        ...
      </extensions:params>
    </jbi:provides>
  </jbi:services>
</jbi:jbi>
```

1 The address prefix is '**topic**' which means that the prefix is the topic name to be created.

After deployment, a new JBI endpoint is available : TopicEndpoint. Each JBI message sent to this endpoint will be published on the topic. A WS-N producer is automatically created. It is in charge of handle the topic and send notification messages to all subscribers.

4.3. Subscribe to WS-N producer

In order to receive WS-Notifications, the consumers MUST subscribe to these notifications to the WS-N producer.

To subscribe to WS notification, the notification consumer must send a specific SOAP message to the notification producer. In the SOAP BC, subscription URL is `http://HOST:PORT/wsn/producer` where :

- HOST is the host you have installed the SOAP BC
- PORT is the port where the SOAP BC listens to incoming SOAP messages

An example of a SOAP subscribe message is :

```
<soap:Envelope xmlns:soap="http://www.w3.org/2003/05/soap-envelope">

  <soap:Header>
    <wsa:To xmlns:wsa="http://www.w3.org/2005/08/addressing">
      http://localhost:8084/wsn-consumer/services/consumer
    </wsa:To>
    <wsa:Action xmlns:wsa="http://www.w3.org/2005/08/addressing">
      http://docs.oasis-open.org/wsn/bw-2/NotificationProducer/SubscribeRequest
    </wsa:Action>
    <wsa:MessageID xmlns:wsa="http://www.w3.org/2005/08/addressing">
      uuid:9888fa43-281f-ea0f-ec21-09e9119366c6
    </wsa:MessageID>
    <wsa:From xmlns:wsa="http://www.w3.org/2005/08/addressing">
      <wsa:Address>http://www.w3.org/2005/08/addressing/role/anonymous</wsa:Address>
    </wsa:From>
  </soap:Header>

  <soap:Body>
    <wsnt:Subscribe xmlns:wsnt="http://docs.oasis-open.org/wsn/b-2">
      <wsnt:ConsumerReference>
        <wsa:Address xmlns:wsa="http://www.w3.org/2005/08/addressing">
          http://127.0.0.1:8084/wsn-consumer/services/consumer1
        </wsa:Address>
      </wsnt:ConsumerReference>
      <wsnt:Filter>
         <wsnt:TopicExpression Dialect="xsd:anyURI">TestTopic</wsnt:TopicExpression>2
      </wsnt:Filter>
    </wsnt:Subscribe>
  </soap:Body>
</soap:Envelope>
```

1 The address to send notifications messages to. This can be simply a Web Service endpoint which can handle notification message

2 The name of the topic

Subscribers can use the PEtALS WS-N client API to subscribe to topics. It can be done like this :

```
package org.ow2.petals.binding.soap.wsn;

import java.net.URI;

import javax.xml.namespace.QName;

import org.ow2.petals.ws.addressing.EndpointReference;
import org.ow2.petals.ws.client.SubscriptionClient;
import org.ow2.petals.ws.client.WsnProducerClient;
import org.ow2.petals.ws.fault.WsnFault;
import org.ow2.petals.ws.notification.TopicExpressionFilter;
```

```
/**
 * Web service notification subscription.
 *
 */
public class SubscribeClient {

    /**
     * @param args
     */
    public static void main(String[] args) {

        EndpointReference sourceEPR = new EndpointReference(URI
                .create("http://localhost:9090/wsn-consumer/"));
        EndpointReference destinationEPR = new EndpointReference(URI
                .create("http://localhost:9090/wsn-consumer/service/consumer"));

        WsnProducerClient client = new WsnProducerClient(sourceEPR,
                destinationEPR);

        TopicExpressionFilter filter = null;
        try {
            filter = new TopicExpressionFilter(new QName("topicSample"));
        } catch (WsnFault e1) {
            e1.printStackTrace();
        }

        SubscriptionClient subsClient = null;
        try {
            subsClient = client.subscribe(sourceEPR, filter, null);
        } catch (WsnFault e) {
            e.printStackTrace();
        }
    }
}
```

4.4. Send a WS notification from a JBI message

When the petals-bc-soap component receives a JBI message on a topic-activated endpoint, it is transformed into a WS notification message and published on the linked topic.

As an example of SOAP notification message, if the JBI message payload is :

```
<text>This is a sample of JBI message payload...</text>
```

and if it is published on the '**TopicSample**' topic, the SOAP body payload of the notification message will be :

```
<wsnt:Notify>
  <wsnt:NotificationMessage>
    <wsnt:SubscriptionReference>
      <wsa:Address xmlns:wsa="http://www.w3.org/2005/08/addressing">
        http://127.0.0.1:8084/wsn-consumer/services/consumer
      </wsa:Address>
    </wsnt:SubscriptionReference>
    <wsnt:Topic Dialect="xsd:anyURI">TopicSample</wsnt:Topic>
    <wsnt:ProducerReference>
      <wsa:Address xmlns:wsa="http://www.w3.org/2005/08/addressing">
        http://127.0.0.1:8084/wsn-producer/services/producer
    </wsa:Address>
    </wsnt:ProducerReference>
    <wsnt:Message>
      <text>This is a sample of JBI message payload...</text>
    </wsnt:Message>
  </wsnt:NotificationMessage>
</wsnt:Notify>
```

Chapter 5. Security

5.1. Introduction

The SOAP binding component provides WS security features through the Axis2 rampart module (http://ws.apache.org/axis2/modules/rampart/1_3/security-module.html).

This module is based on Apache WSS4J (http://ws.apache.org/wss4j), an implementation of the OASIS WS-security (http://www.oasis-open.org/committees/tc_home.php?wg_abbrev=wss).

5.2. Configuration

In order to enable WS-security, you must add specific extensions to the consumes section of the Service Unit. This configuration will tell Rampart which security mode to be applied. Here's an example of a jbi.xml providing a simple Rampart configuration, with UsernameToken and Timestamping authentification :

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

  <jbi:jbi version="1.0" xmlns:jbi="http://java.sun.com/xml/ns/jbi"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns:technical="http://myexamples.technical.services.esb.acoss.fr/1.0"
  xmlns:extensions="http://petals.objectweb.org/extensions/"
  xmlns:keyvalue="http://petals.objectweb.org/extensions/key-value/">
  <jbi:services binding-component="true">
        <jbi:consumes interface-name="technical:MyExample"
                service-name="technical:MyExampleService">
                <extensions:params>
                        <extensions:param name="address">MyExampleService</extensions:param>
                        <extensions:param name="modules">rampart</extensions:param>
                        <extensions:param name="service-parameters">
                                <![CDATA[
                                <parameter name="InflowSecurity">
                                        <action>
                                        <items>UsernameToken Timestamp</items>

 <passwordCallbackClass>org.objectweb.petals.security.handler.MyExampleHandler</
passwordCallbackClass>
                                        </action>
                                </parameter>
                                ]]>
                        </extensions:param>
                </extensions:params>
        </jbi:consumes>
  </jbi:services>
</jbi:jbi>
```

On this example, an Axis2 service will be created (MyExampleService) and is secured by a defined security handler:

- The **<extensions:param name="modules">rampart</extensions:param>** tag allows to engage the rampart module for the MyExampleService service.
- The **<extensions:param name="service-parameters">** tag allows to configure rampart for this service, using the InflowSecurity parameter (you can also use the OutflowSecurity parameter).

The `org.objectweb.petals.security.handler.MyExampleHandler` Class is the handler used by the service. The following code snippet is an example of Handler implementation to validate user/password credentials:

```
package org.objectweb.petals.security.handler;

import org.apache.ws.security.WSPasswordCallback;

import javax.security.auth.callback.Callback;
```

```
import javax.security.auth.callback.CallbackHandler;
import javax.security.auth.callback.UnsupportedCallbackException;

import java.io.IOException;

public class MyExampleHandler implements CallbackHandler {

    public void handle(Callback[] callbacks) throws IOException,
            UnsupportedCallbackException {
        for (int i = 0; i < callbacks.length; i++) {
            WSPasswordCallback pwcb = (WSPasswordCallback)callbacks[i];
            String id = pwcb.getIdentifer();
            if("bob".equals(id)) {
                pwcb.setPassword("bobPW");
            }
        }
    }
}
```

This class MUST be provided in the service unit. It will be handled by the SOAP binding component and the Rampart module.

Note

If you use maven2 to package you service unit, you just have to add this java class under a `src/main/java` directory of your jbi-service-unit project.

The service is now secured with Rampart. If a SOAP message without security headers is handled by the service, a SOAP fault will be returned with message like: *"Incoming message does not contain required Security header"*.

5.3. Client side

The SOAP header must contains the required security elements like in the following SOAP message snippet :

```
<soapenv:Header>
   <wsse:Security
    xmlns:wsse="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-wssecurity-secext-1.0.xsd"
    soapenv:mustUnderstand="1">
      <wsu:Timestamp

 xmlns:wsu="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-wssecurity-utility-1.0.xsd"
       wsu:Id="Timestamp-26598747">
         <wsu:Created>2007-07-30T14:59:34.944Z</wsu:Created>
         <wsu:Expires>2007-07-30T15:04:34.944Z</wsu:Expires>
      </wsu:Timestamp>
      <wsse:UsernameToken

 xmlns:wsu="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-wssecurity-utility-1.0.xsd"
       wsu:Id="UsernameToken-6427893">
         <wsse:Username>bob</wsse:Username>
         <wsse:Password

 Type="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-username-token-profile-
1.0#PasswordDigest">
            0ziDIJ4Gd0XHbbbB/rgasDpOZJY=
         </wsse:Password>
         <wsse:Nonce>
            fqgz0lkb7/ezFiY7Km4qvg==
         </wsse:Nonce>
         <wsu:Created>
            2007-07-30T14:59:34.944Z
         </wsu:Created>
      </wsse:UsernameToken>
   </wsse:Security>
</soapenv:Header>
```

The following code snippet shows how to engage the rampaet module on the client side and how to call the Web Service :

```
ConfigurationContext ctx = ConfigurationContextFactory
  .createConfigurationContextFromFileSystem(axis2ConfPath, null);

ServiceClient client = new ServiceClient(ctx, null);
OMElement payload = getSayHelloOMElement(sayHelloStr);

Options options = new Options();
options.setProperty(WSSHandlerConstants.OUTFLOW_SECURITY, getOutflowConfiguration("bob"));
client.engageModule(new QName("rampart"));

options.setTo(targetEPR);
options.setAction("sayHello");

client.setOptions(options);
result = client.sendReceive(payload);
```

The `axis2ConfPath` directory must point to a directory in which a `modules` directory contains the `rampart-1.2.mar` module used by the client. The code also uses a Class handler which is similar to the service's one, and will provide the required user and password :

```
package org.objectweb.petals.security.client.handler;

import org.apache.ws.security.WSPasswordCallback;

import javax.security.auth.callback.Callback;
import javax.security.auth.callback.CallbackHandler;
import javax.security.auth.callback.UnsupportedCallbackException;

import java.io.IOException;

public class MyExampleClientHandler implements CallbackHandler {

    public void handle(Callback[] callbacks) throws IOException,
            UnsupportedCallbackException {
        for (int i = 0; i < callbacks.length; i++) {
            WSPasswordCallback pwcb = (WSPasswordCallback)callbacks[i];
            String id = pwcb.getIdentifer();
            if("bob".equals(id)) {
                pwcb.setPassword("bobPW");
            }
        }
    }
}
```

In this example, the user name is sent in **plain clear text** in the request. Depending on your security needs, you should use a secured transport layer (such as HTTPS), or another Rampart configuration to encrypt the information (and even the body content if required). For more Rampart configuration examples, you should have a look at the samples provided by Apache in the rampart distribution at : http://www.apache.org/dyn/closer.cgi/ws/rampart/1_3.