Tutorial for Java Server Faces FormBuilder

Version 1.1

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Content

Tutorial

Prerequisites

1. The JSF libraries (Version 1.1 or higher) as part of the Java Web Services Pack which can be downloaded from Sun.
2. A servlet engine to deploy your JSF web application. You can use Tomcat which is part of the Web Services Pack.

Installation

1. Copy the **`formbuilder.zip`** into a new directory.
2. Unzip the file.
3. Run the application with: **`java -jar formbuilder.jar`**

Concepts

The new JSF library is framework for creating web applications quick and easy. The library shields the developer from writing complex code to process the request from a HTML form. Despite JSF's clear and easy to understand concepts the definition and backing code for a form is spread into at least 3 different files. The design of a form is defined in a JSP using the JSF tag libraries, the code for its data model is defined a Java Bean (called the backing bean), while the wiring between the bean and the navigation between the forms is done in the JSF configuration file (**`faces-config.xml`**).

The goal of the JSF FormBuilder tool is to ease the initial creation of a new JSF form by auto generating the JSP, the backing bean and the definitions in the **`faces-config.xml`**.

A form generated by the JSF FormBuilder consists of a number of fields (text fields, check boxes, list boxes, radio boxes etc.) and a set of buttons for submitting the form. For each form the JSF FormBuilder creates:

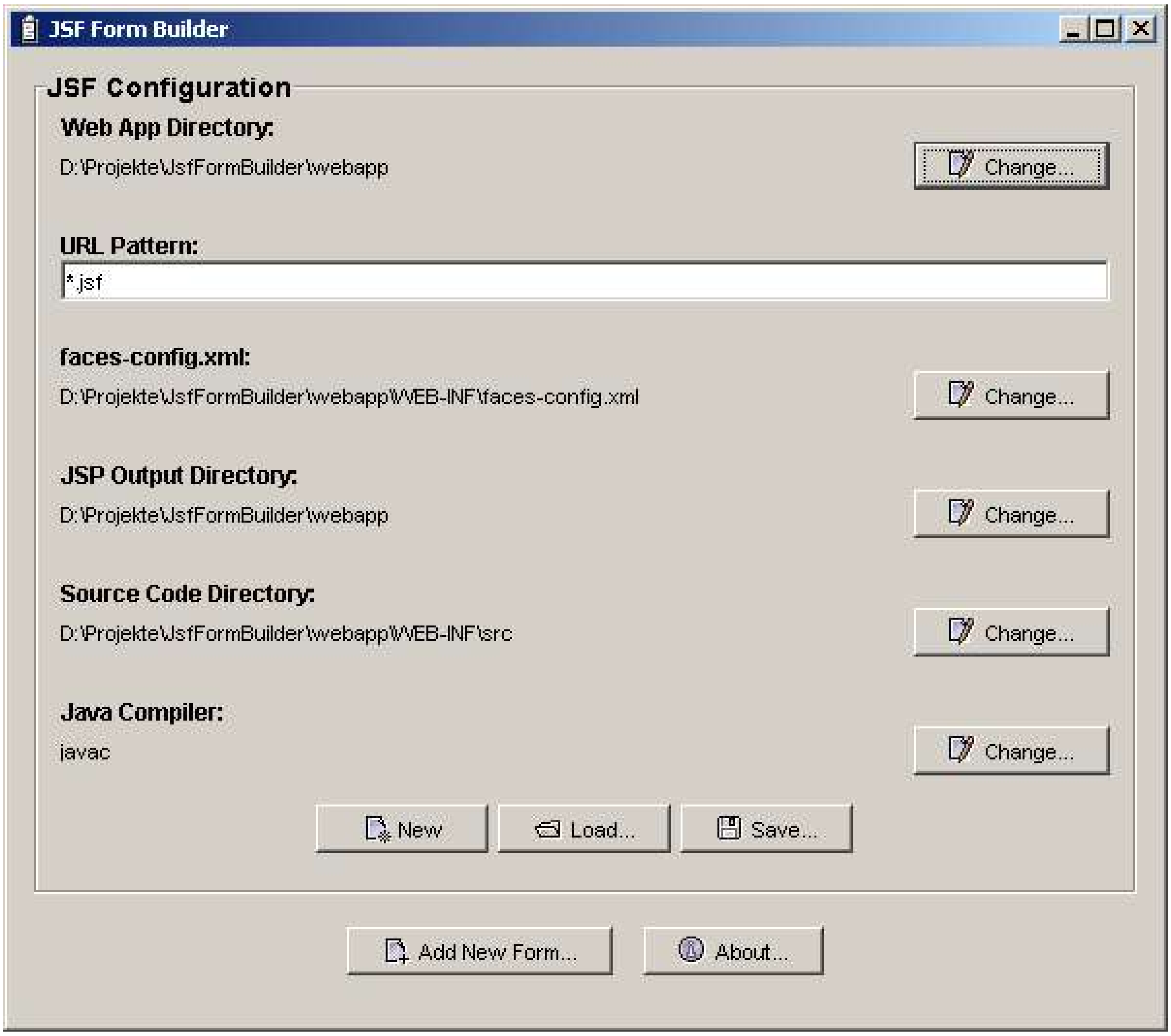
- the JSP with the JSF tags for the form,
- the source and the class file for a java bean called the backing bean with properties for each field, methods to handle the actions from the submit buttons and methods for validating the fields.
- the necessary tags in the JSF configuration file (usually called **`faces-config.xml`**) for the backing bean registration and the navigation handling.
- the tags to setup JSF in the web application deployment descriptor **`web.xml`**.

Starting with the automatic created code for the form it is much easier to add the business functionality to the backing bean and modify the design of the form in the JSP than writing everything from scratch.

Running the Application, Step by Step

Step 1: Setting up your JSF and web environment

The application starts with the following window:



Web App Directory:
D:\Projekte\JsfFormBuilder\webapp

URL Pattern:
*.jsf

faces-config.xml:
D:\Projekte\JsfFormBuilder\webapp\WEB-INF\faces-config.xml

JSP Output Directory:
D:\Projekte\JsfFormBuilder\webapp

Source Code Directory:
D:\Projekte\JsfFormBuilder\webapp\WEB-INF\src

Java Compiler:
javac

In order to setup your JSF environment you have to:

1. Set the directory for your web application (<WEBAPP>) for which you want to create the forms. By default it creates a `<CURRENT>/webapp/` directory in the directory (<CURRENT>) where the FormBuilder has been started from. If the application finds the web application deployment descriptor in `<WEBAPP>/WEB-INF/web.xml` it reads the settings for the URL pattern and the JSF configuration file.
2. Define the source directory for the source code of the generated backing bean. By default it uses the `<WEBAPP>/WEB-INF/src/` directory which is created if it doesn't exist.
3. If you don't start from an existing JSF web application but create a new one from scratch copy the following files to the `<WEBAPP>/WEB-INF/lib/` directory:

```
- jsf-api.jar
- jsf-impl.jar
- jslt.jar
- commons-beanutils.jar
- commons-collections.jar
- commons-digester.jar
- commons-logging.jar
- html_basic.tld
- jsf_core.tld
- web-facesconfig_1_0.dtd
- web-facesconfig_1_1.dtd
```

Only the `jsf-api.jar` has to be found in `<CURRENT>/lib/` because it is necessary to compile the backing bean automatically by the FormBuilder. All other files for the JSF web application (`web.xml`, `faces-config.xml`) are created or modified automatically by the FormBuilder.

4. If you can't run the JDK 1.4 Java compiler `javac` directly from the command line, change the Java Compiler setting and point to the `javac.exe` (usually in the `<JDK>/bin/` directory) you want to use for compiling your backing beans.

Save and load your configuration

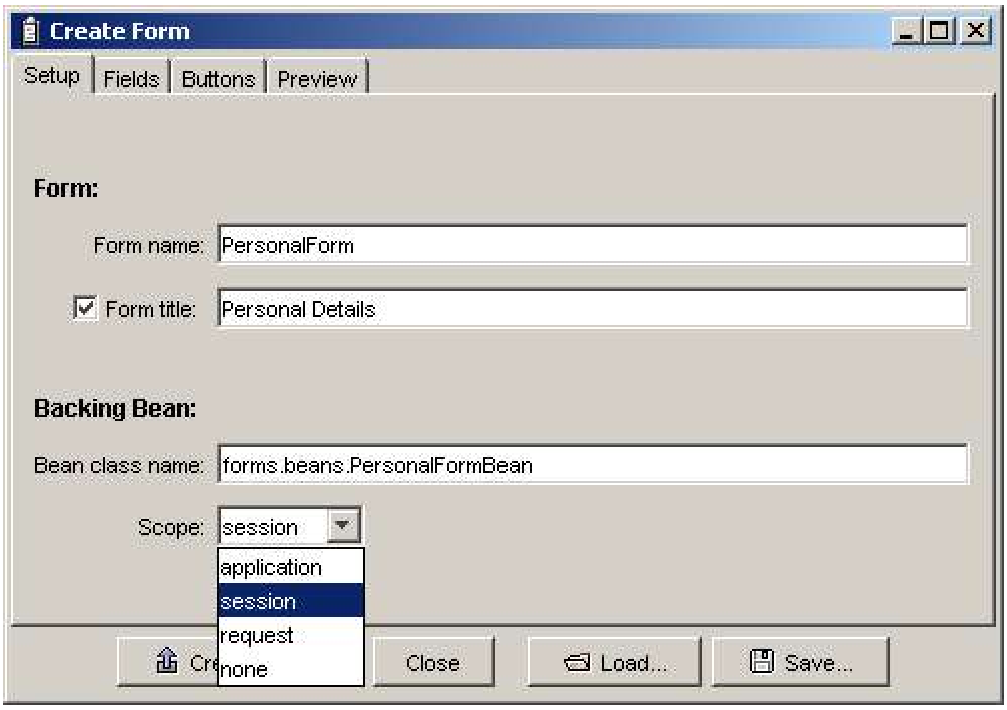
The JSF and web application configuration can be saved to disk and reloaded to add more forms later. It uses the Java Bean XML file format, defined by the JDKs `XMLEncoder` class.

Step 2: Create a New Form

In order to create a new form press the ***Add New Form...*** button. It brings up a new dialog with several tabs to define your form settings.

Setup

This allows the setup of the basic data for the form:



Form:

Form name: PersonalForm

☑ Form title: Personal Details

Backing Bean:

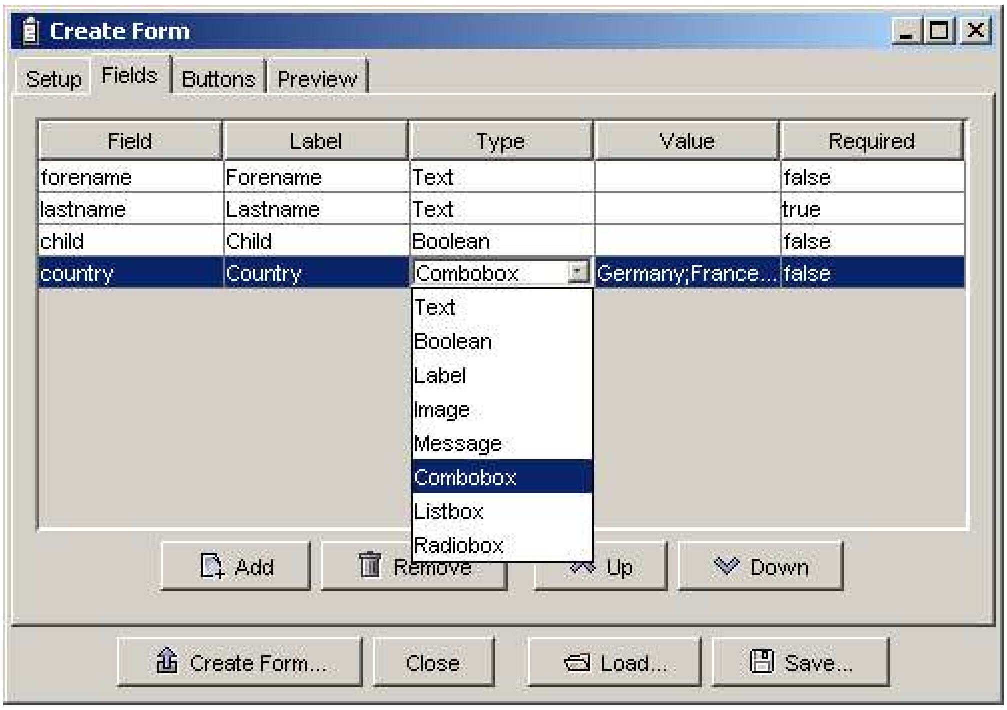
Bean class name: forms.beans.PersonalFormBean

Scope: session

Enter the name of the new form, it's title and the class name for it's backing bean (including package) and its scope. If the ***Form title*** check box is selected the form title is displayed on the page.

Fields

In the ***Fields*** tab you define the fields of the form:



Field	Label	Type	Value	Required
forename	Forename	Text		false
lastname	Lastname	Text		true
child	Child	Boolean		false
country	Country	Combobox	Germany;France...	false

The ***Field*** column defines the name of the field in the backing bean, the ***Label*** column its label in the form. The ***Type*** of the field determines the form component and the type in the backing bean. It can be:

Field Type	***Component***	***Backing Bean Type***
Text	Text field (single line)	**`java.lang.String`**
Boolean	Check box	**`boolean`**
Message	Parameterized Text.	**`java.lang.String`**
Label	**`<h3>`** ***label text*** **`</h3>`**	none
Image	Image	none
Combobox	Combo box	**`java.lang.String`**
Radiobox	Radio boxes	**`java.lang.String`**
Listbox	List box (multi selectable)	**`java.lang.String[]`**

With the help of the ***Value*** column you can define default values for the fields. The image field interprets the ***Value*** as the URL of the image. The multi value fields (combobox, radiobox and listbox) use the '`;`' character to separate the possible values.

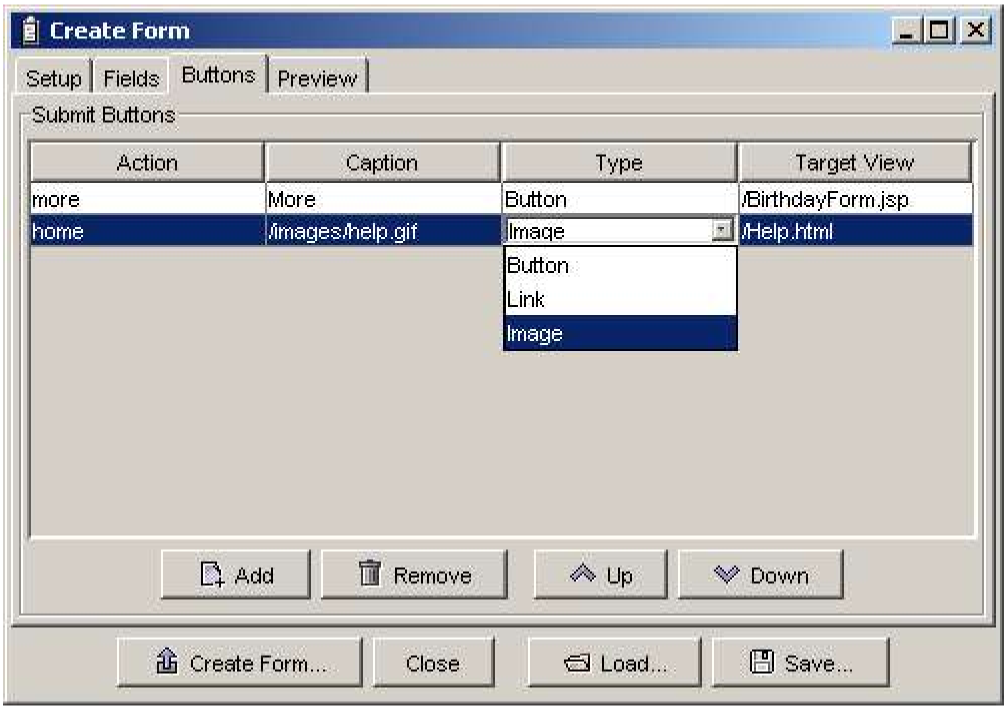
The ***Required*** column allows to define a field as required, where a user has to enter something in order to submit the form.

New fields can be added with the ***Add...*** button. ***Remove*** removes the currently selected field. With ***Up*** and ***Down*** the fields can be reordered.

Each field results in corresponding **`get/set`**<FIELD> methods in the backing bean. In addition for each text field the application creates a validation method called **`validate`**<FIELD>.

Buttons

In the ***Buttons*** tab you define the buttons of the form which are placed beside each other on the form:



Action	Caption	Type	Target View
more	More	Button	/BirthdayForm.jsp
home	/images/help.gif	Image	/Help.html

You can choose from three different buttons types:

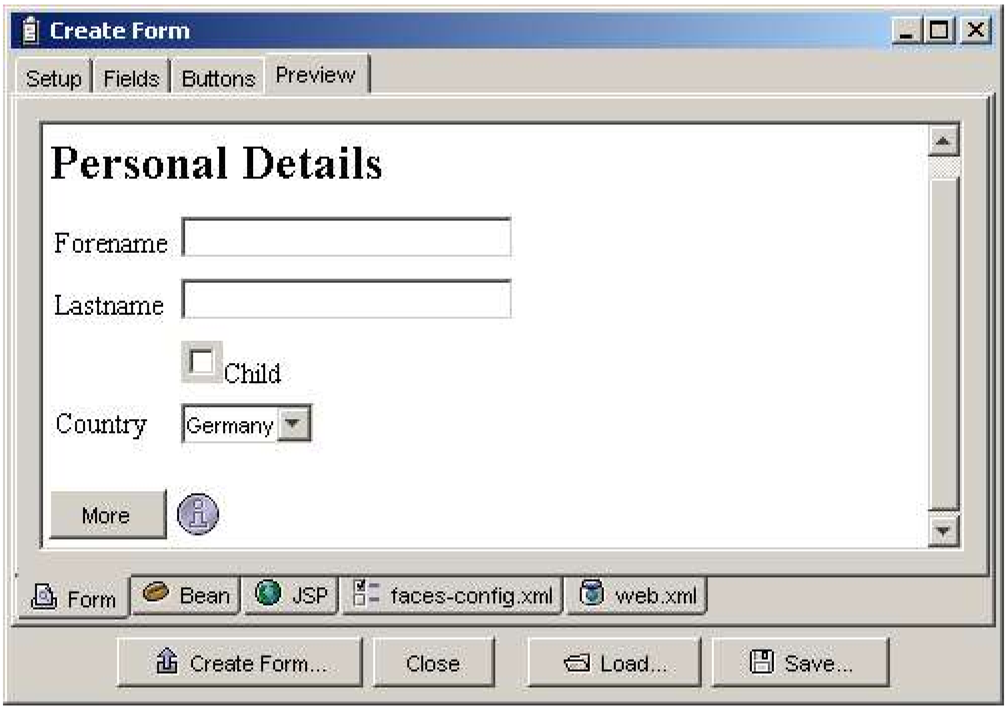
- standard submit buttons,
- links and
- image buttons.

The ***Action*** of each button is the resulting command when the button is pressed. Therefore for each button there is an action method defined in the backing bean. The name of this method is `<ACTION>Action` and it returns the `<ACTION>` value. In the `<navigation>` section of the `faces-config.xml` there is a translation from the `<ACTION>` value into the URL of the ***Target View***.

The ***Caption*** defines the buttons caption or the URL to the image for the image button respectively.

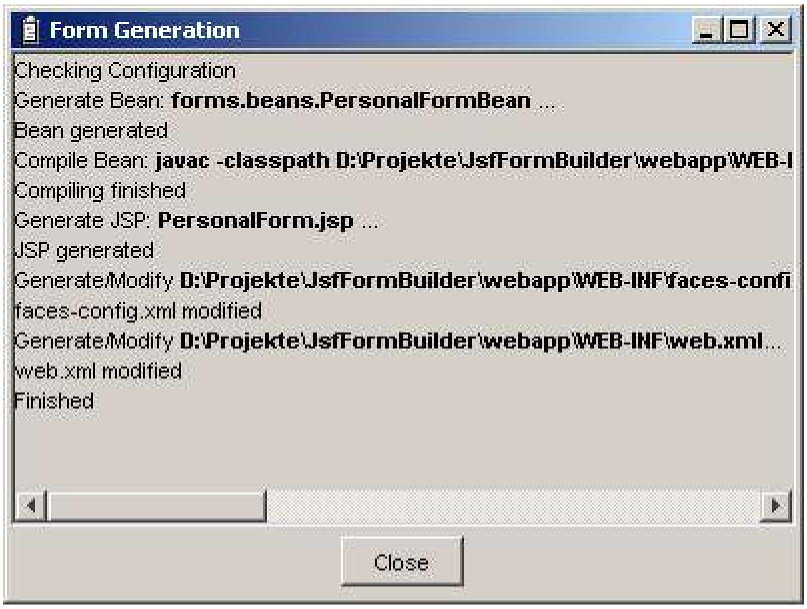
New buttons can be added with the ***Add...*** button. ***Remove*** removes the currently selected button. With ***Up*** and ***Down*** the buttons can be reordered.

Preview



This tab section allows the preview of the form, the generated JSP, the backing bean source code and the modifications to the `faces-config.xml` and `web.xml` files before the form is generated.

Generate the Form

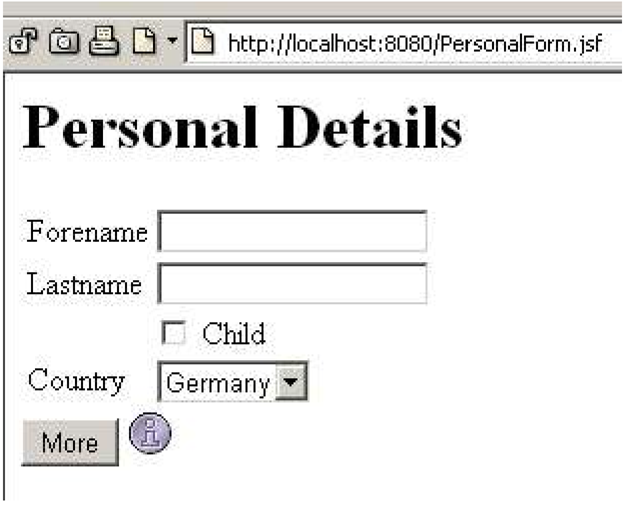


```
Checking Configuration
Generate Bean: forms.beans.PersonalFormBean ...
Bean generated
Compile Bean: javac -classpath D:\Projekte\JsfFormBuilder\webapp\WEB-I
Compiling finished
Generate JSP: PersonalForm.jsp ...
JSP generated
Generate/Modify D:\Projekte\JsfFormBuilder\webapp\WEB-INF\faces-confi
faces-config.xml modified
Generate/Modify D:\Projekte\JsfFormBuilder\webapp\WEB-INF\web.xml...
web.xml modified
Finished
```

When you are happy with your form it can be generated. Press the ***Create Form...*** button and an information dialog pops up, explaining what steps are going on. If the JSP or the backing bean already exist, you are asked to overwrite the files (as well as the backing bean section in the `faces-config.xml)`.

Testing the Form

Start your servlet server and (re)deploy your web application. The new form is ready for testing and should work already. You should get something like:



☐ Child

Country Germany

(Make sure your include the URL pattern for the JSF servlet in your URL).

If you are not happy with your form, you can change it in the still open ***Create Form*** dialog and regenerate the form.

Save and Load Forms

Form definitions can be saved to disk and reloaded for later change or as the basis for another form. It uses the Java Bean XML file format, defined by the JDKs XMLEncoder class.

Step 3: Modify the generated Form

Form design

Change the JSP (e.g. add HTML tags, reorder and modify the generated JSF tags) to change the page design of your form.

Input field validation

If you want to use a custom code to validate certain fields you have to modify the `validate<Field>` method in the backing bean. E.g if your input field is called `name` you need to change the method:

```
validateName(javax.faces.context.FacesContext context,
  javax.faces.component.UIComponent component,
  Object value)
    throws javax.faces.validator.ValidatorException.
```

If the content of the field is invalid throw a

```
  new ValidatorException(
    new javax.faces.application.FacesMessage(String errorMessage)) .
```

Button action

If you want submit different action codes depending on the entered data or you want to update your backend system you have to modify the `<Action>Action` method in the backing bean for the button with the action `<Action>`. E.g if your button has the action `submit` look for the method `submitAction()`.

To remap the action to a different URL modify the `faces-config.xml`. Look for the section `<navigation-rule>` with a `view-id` which has the name of the forms JSP.

Solving Common Problems

The compiling of the backing bean fails

Make sure the application can call the java compiler and you have the **`jsf-api.jar`** library in the **`<CURRENT>/lib/`** directory.

Error: 'Can't find FacesContext'

You forgot to include the path to the faces servlet in your URL. Therefore JSF doesn't find its controller. It should look like: **`http://myhost/MyForm.jsf`** (if you use the standard URL pattern **`*.jsf`**).

Recreate Forms without loosing changes to the backing bean

Put your changes in a derived class of the backing bean and change the **`faces-config.xml`** (**`<managed-bean>`** section) to use it instead. Then you can safely recreate the backing bean without loosing your changes. As long as you don't change the old fields it should still work.

How to change the templates for the generated Java source code and JSPs (New in Version 1.1)

The FormBuilder uses Velocity to generate the files. The template for the Java backing beans is stored in **`templates/bean.java.vm`** and for the JSPs in **`templates/form.jsp.vm`**. Please see the Velocity tutorial on how to adapt the templates for your own project.