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Creating and Running a Project in Eclipse

Edit This Page (https://github.com/vaadin/vaadin/edit/master/documentation/getting-started/getting-started-first-project.asciidoc)

This section gives instructions for creating a new Eclipse project using the Vaadin Plugin. The task will include the following steps:

1. Create a new project
2. Write the source code
3. Configure and start web server
4. Open a web browser to use the web application

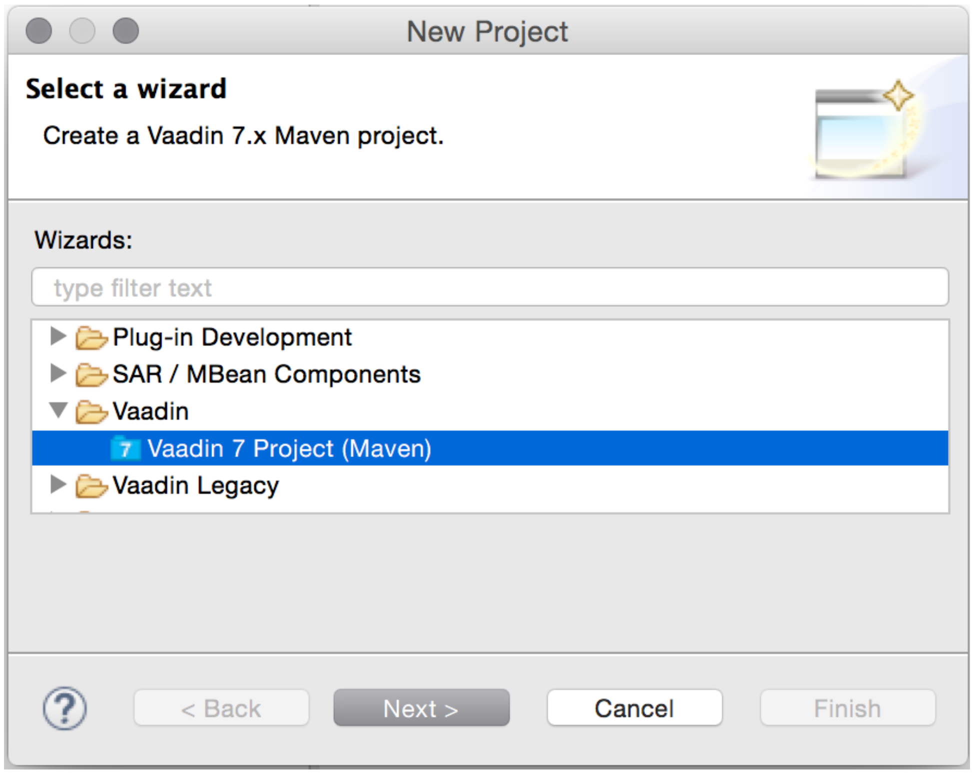
We also show how you can debug the application in the debug mode in Eclipse.

This walkthrough assumes that you have already installed the Eclipse IDE, the Vaadin Plugin, and a development server, as instructed in Installing the Eclipse IDE and Plugin (../../framework/installing/installing-eclipse.html#installing.eclipse).

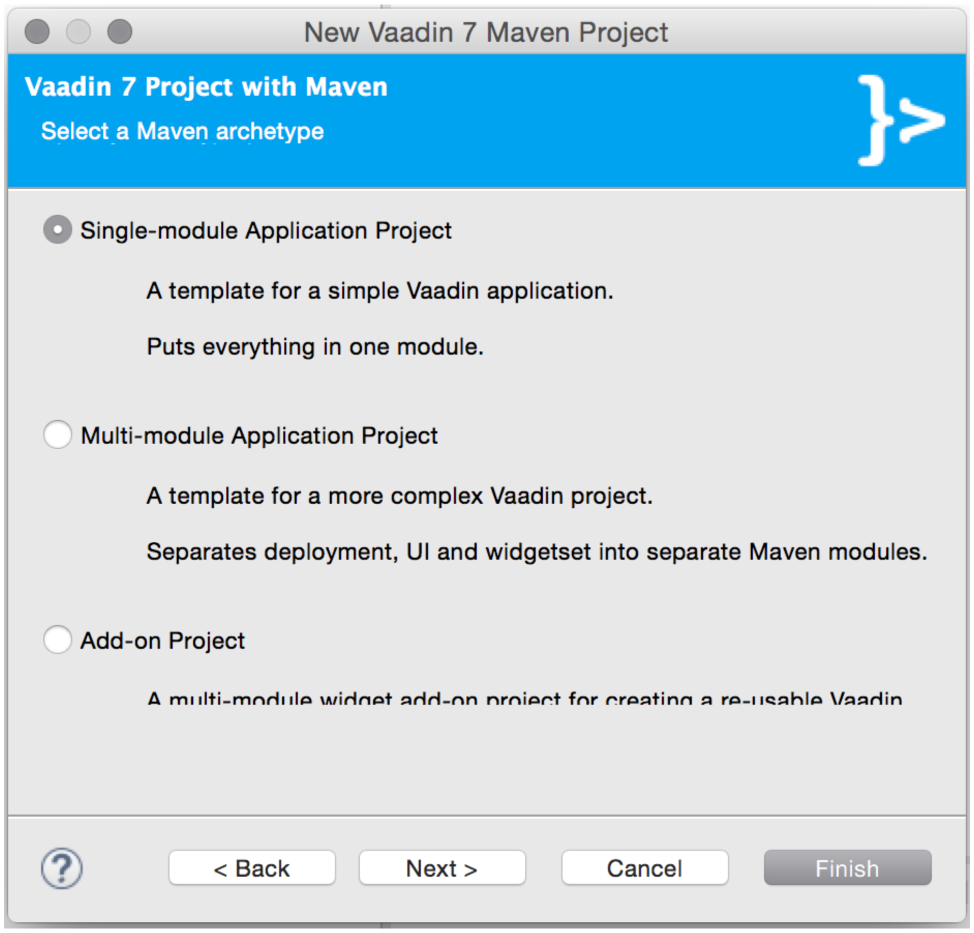
Creating a Maven Project

Let us create the first application project with the tools installed in the previous section. First, launch Eclipse and follow the following steps:

1. Start creating a new project by selecting from the menu **File** ‣ **New** ‣ **Project...**.
2. In the **New Project** window that opens, select **Vaadin** ‣ **Vaadin 8 Project (Maven)** and click **Next**.



3. In the **Select a Maven archetype** step, you need to select the project type. To create a simple test project, select the **Single-module Application Project**.



New Vaadin 7 Maven Project

Vaadin 7 Project with Maven

Select a Maven archetype

[✓ Single-module Application Project]

A template for a simple Vaadin application.

Puts everything in one module.

Multi-module Application Project

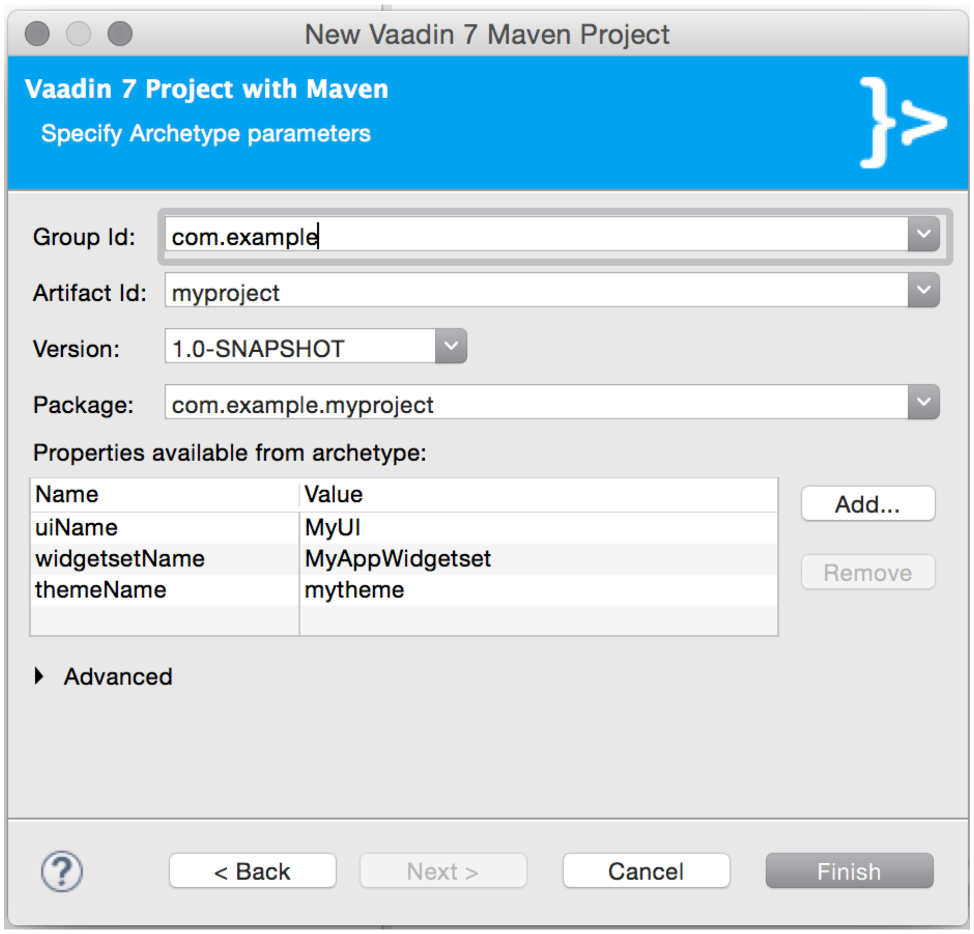
A template for a more complex Vaadin project.

Separates deployment, UI and widgetset into separate Maven modules.

Add-on Project

A multi-module widget add-on project for creating a re-usable Vaadin

4. In the **Specify archetype parameters** step, you need to give at least the **Group Id** and the **Artifact Id**. The default values should be good for the other settings.



New Vaadin 7 Maven Project

Vaadin 7 Project with Maven

Specify Archetype parameters

Group Id: com.example

Artifact Id: myproject

Version: 1.0-SNAPSHOT

Package: com.example.myproject

Properties available from archetype:

Name	Value
uiName	MyUI
widgetsetName	MyAppWidgetset
themeName	mytheme

Group Id

Give the project an organization-level identifier, for example, com.example. It is used as a prefix for your Java package names, and hence must be a valid Java package name itself.

Artifact Id
Give the project a name, for example, `myproject`. The artifact ID must be a valid Java sub-package name.

Version
Give the project a Maven compatible version number, for example, `1.0-SNAPSHOT`. The version number should typically start with two or more integers separated with dots, and should not contain spaces.

Package
Give the base package name for the project, for example, com.example.myproject. It is by default generated from the group ID and the artifact ID.

Properties
Enter values for archetype-specific properties that control naming of various elements in the created project, such as the UI class name.

You can change the version later in the `pom.xml`.

Finally, click **Finish** to create the project.

Exploring the Project

After the **New Project** wizard exits, it has done all the work for you. A UI class skeleton has been written to the `src` directory. The project hierarchy shown in the Project Explorer is shown in A new Vaadin project.

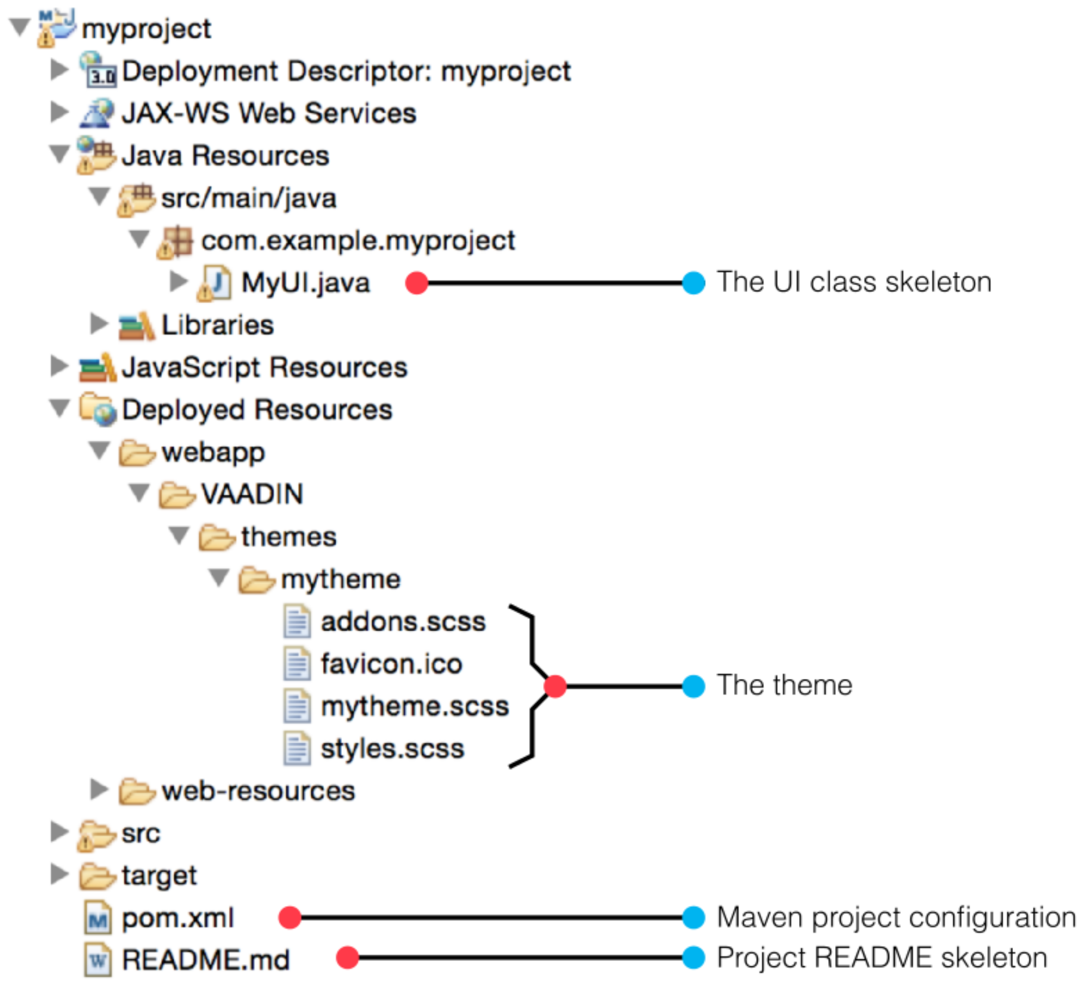


Figure 1. A new Vaadin project

The Vaadin libraries and other dependencies are managed by Maven. Notice that the libraries are not stored under the project folder, even though they are listed in the **Java Resources** ‣ **Libraries** ‣ **Maven Dependencies** virtual folder.

The UI Class

The UI class created by the plug-in contains the following code:

```
package com.example.myproject;

import com.vaadin.ui.UI;
...

@Theme("mytheme")
public class MyUI extends UI {

    @Override
    protected void init(VaadinRequest vaadinRequest) {
        final VerticalLayout layout = new VerticalLayout();

        final TextField name = new TextField();
        name.setCaption("Type your name here:");

        Button button = new Button("Click Me");
        button.addClickListener(e ->
            layout.addComponent(new Label("Thanks " + name.getValue()
                    + ", it works!")));

        layout.addComponents(name, button);

        setContent(layout);
    }

    @WebServlet(urlPatterns = "/*", name = "MyUIServlet", asyncSupported = true)
    @VaadinServletConfiguration(ui = MyUI.class, productionMode = false)
    public static class MyUIServlet extends VaadinServlet {
    }
}
```

Compiling the Theme

Before running the project for the first time, click the **Compile Vaadin Theme** button in the toolbar, as shown in Compile Vaadin Theme.

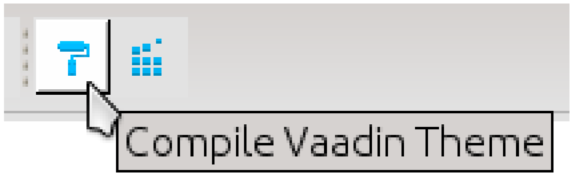
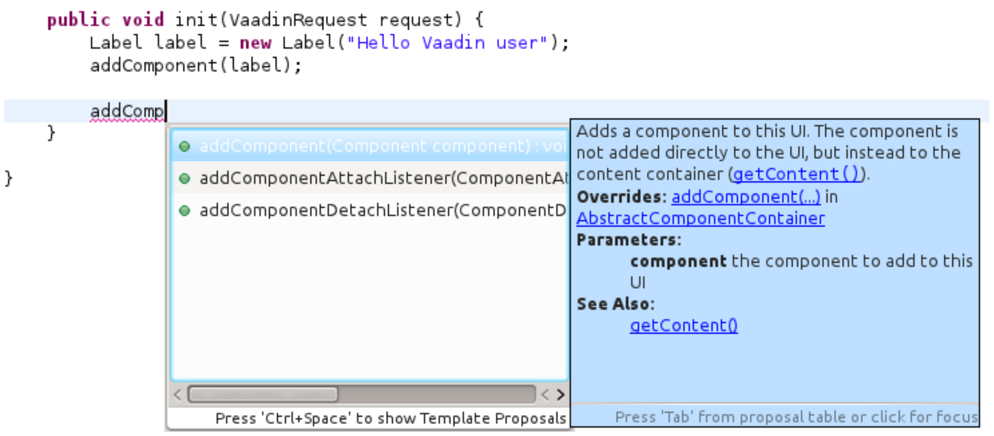


Figure 2. Compile Vaadin Theme

Coding Tips for Eclipse

Code Completion

One of the most useful features in Eclipse is *code completion*. Pressing Ctrl+Space in the editor will display a pop-up list of possible class name and method name completions, as shown in Java Code Completion in Eclipse, depending on the context of the cursor position.



```
    public void init(VaadinRequest request) {
        Label label = new Label("Hello Vaadin user");
        addComponent(label);

        addComp
    }

}
```

addComponent(Component component) : voi
addComponentAttachListener(ComponentA
addComponentDetachListener(ComponentD

Adds a component to this UI. The component is not added directly to the UI, but instead to the content container (getContent()).
Overrides: addComponent(...) in AbstractComponentContainer
Parameters:
component the component to add to this UI
See Also:
getContent()

Press 'Ctrl+Space' to show Template Proposals
Press 'Tab' from proposal table or click for focus

Figure 3. Java Code Completion in Eclipse

Generating Imports

To automatically add an `import` statement for a class, such as **Button**, simply press `Ctrl`+`Shift`+`O` or click the red error indicator on the left side of the editor window. If the class is available in multiple packages, a list of the alternatives is displayed, as shown in Importing classes automatically.

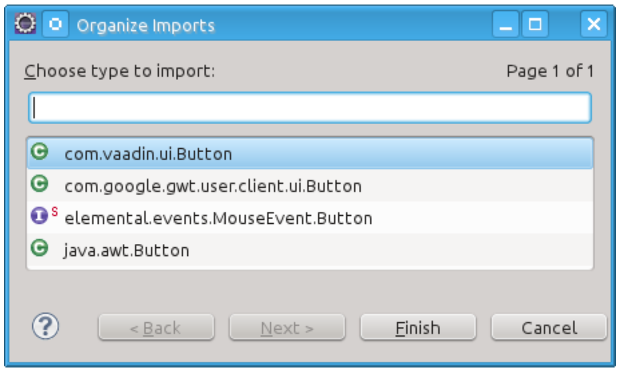


Figure 4. Importing classes automatically

For server-side Vaadin development, you should generally use the classes under the com.vaadin.ui or com.vaadin.server packages. *You can not use client-side classes (under com.vaadin.client) or GWT classes for server-side development.*

Setting Up and Starting the Web Server

Eclipse IDE for Java EE Developers has the Web Standard Tools package installed, which supports control of various web servers and automatic deployment of web content to the server when changes are made to a project.

Make sure that Tomcat was installed with user permissions. Configuration of the web server in Eclipse will fail if the user does not have write permissions to the configuration and deployment directories under the Tomcat installation directory.

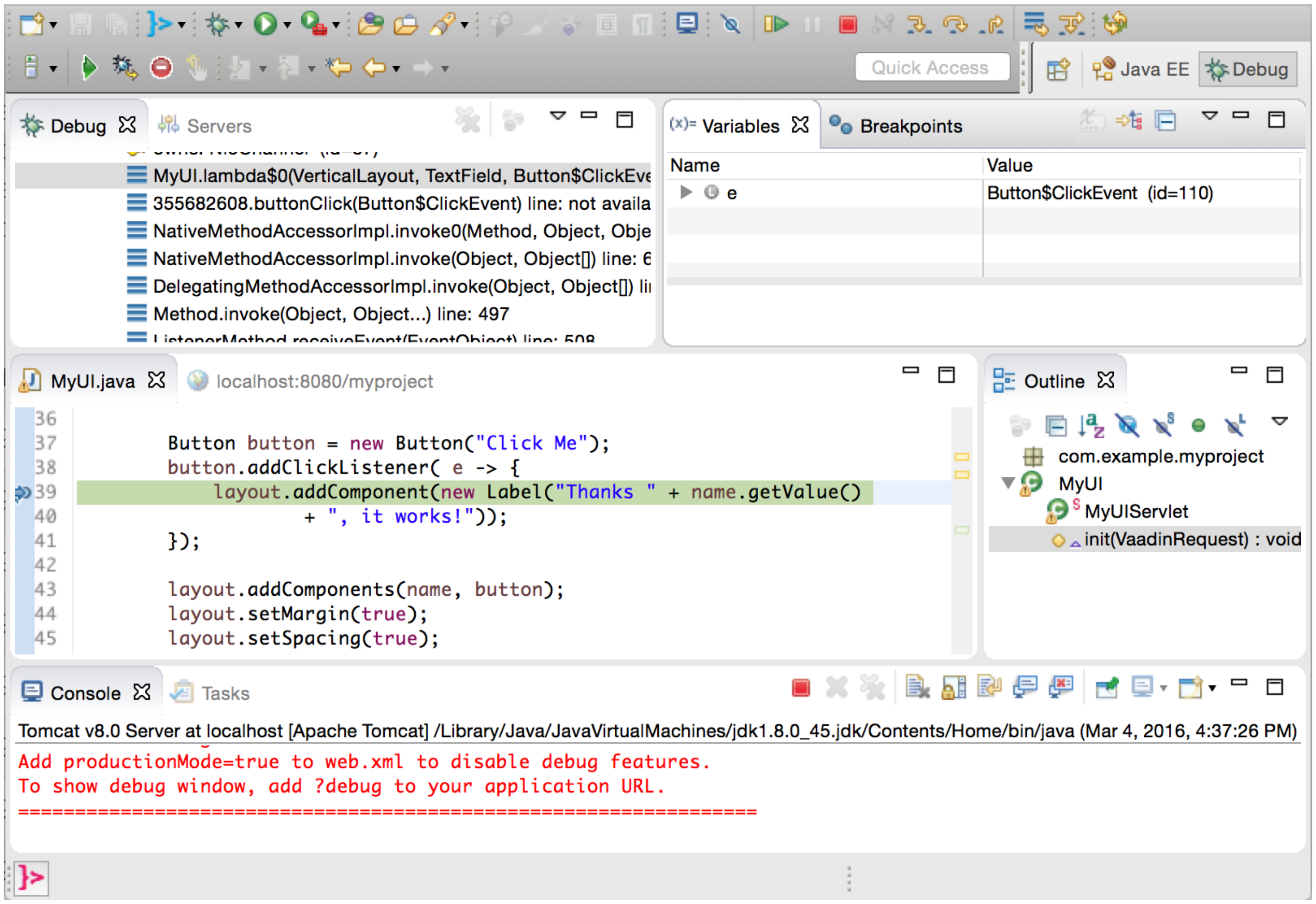
Follow the following steps:

1. Switch to the **Servers** tab in the lower panel in Eclipse. List of servers should be empty after Eclipse is installed. Right-click on the empty area in the panel and select **New** ‣ **Server**.
2. Select **Apache** ‣ **Tomcat v8.0 Server** and set **Server's host name** as `localhost`, which should be the default. If you have only one Tomcat installed, **Server runtime** has only one choice. Click **Next**.
3. Add your project to the server by selecting it on the left and clicking **Add** to add it to the configured projects on the right. Click **Finish**.
4. The server and the project are now installed in Eclipse and are shown in the **Servers** tab. To start the server, right-click on the server and select **Debug**. To start the server in non-debug mode, select **Start**.
5. The server starts and the WebContent directory of the project is published to the server on http://localhost:8080/myproject/ (http://localhost:8080/myproject/).

Running and Debugging

Starting your application is as easy as selecting **myproject** from the **Project Explorer** and then **Run** ‣ **Debug As** ‣ **Debug on Server**. Eclipse then opens the application in built-in web browser.

You can insert break points in the Java code by double-clicking on the left margin bar of the source code window. For example, if you insert a breakpoint in the *buttonClick()* method and click the **What is the time?** button, Eclipse will ask to switch to the Debug perspective. Debug perspective will show where the execution stopped at the breakpoint. You can examine and change the state of the application. To continue execution, select **Resume** from **Run** menu.



```
MyUI.lambda$0(VerticalLayout, TextField, Button$ClickEve
355682608.buttonClick(Button$ClickEvent) line: not availa
NativeMethodAccessorImpl.invoke0(Method, Object, Obje
NativeMethodAccessorImpl.invoke(Object, Object[]) line: 6
DelegatingMethodAccessorImpl.invoke(Object, Object[]) lii
Method.invoke(Object, Object...) line: 497
```

Name	Value
e	Button$ClickEvent (id=110)

```java
        Button button = new Button("Click Me");
        button.addClickListener( e -> {
            layout.addComponent(new Label("Thanks " + name.getValue()
                    + ", it works!"));
        });

        layout.addComponents(name, button);
        layout.setMargin(true);
        layout.setSpacing(true);
```

```
com.example.myproject
MyUI
  MyUIServlet
  init(VaadinRequest) : void
```

```
Tomcat v8.0 Server at localhost [Apache Tomcat] /Library/Java/JavaVirtualMachines/jdk1.8.0_45.jdk/Contents/Home/bin/java (Mar 4, 2016, 4:37:26 PM)
Add productionMode=true to web.xml to disable debug features.
To show debug window, add ?debug to your application URL.
=================================================================
```

Figure 5. Debugging a Vaadin Application

Above, we described how to debug a server-side application. Debugging client-side applications and widgets is described in Debugging Client-Side Code (../../framework/clientside/clientside-debugging.html#clientside.debugging).

Updating the Vaadin Framework Libraries

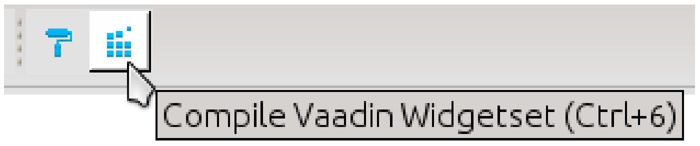
Updating the Vaadin plugin does not update Vaadin Framework libraries. The libraries are project specific, as a different version might be required for different projects, so you have to update them separately for each project.

1. Open the `pom.xml` in an editor in Eclipse.

2. Edit the `vaadin.version` property to set the Vaadin version.

   Updating the libraries can take several minutes. You can see the progress in the Eclipse status bar. You can get more details about the progress by clicking the indicator.

3. *In Vaadin 7.6 and older*: if you have compiled the widget set for your project, recompile it by clicking the **Compile Vaadin Widgetset** button in the Eclipse toolbar.



4. Stop the integrated Tomcat (or other server) in Eclipse, clear its caches by right-clicking the server and selecting **Clean** as well as **Clean Tomcat Work Directory**, and restart it.

If you experience problems after updating the libraries, you can try using **Maven ‣ Update Project**.

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