

JDK-WildFly-NetBeans Setup Local

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Overview

In this tutorial, we download the three primary components required to establish our Java EE programming environment.

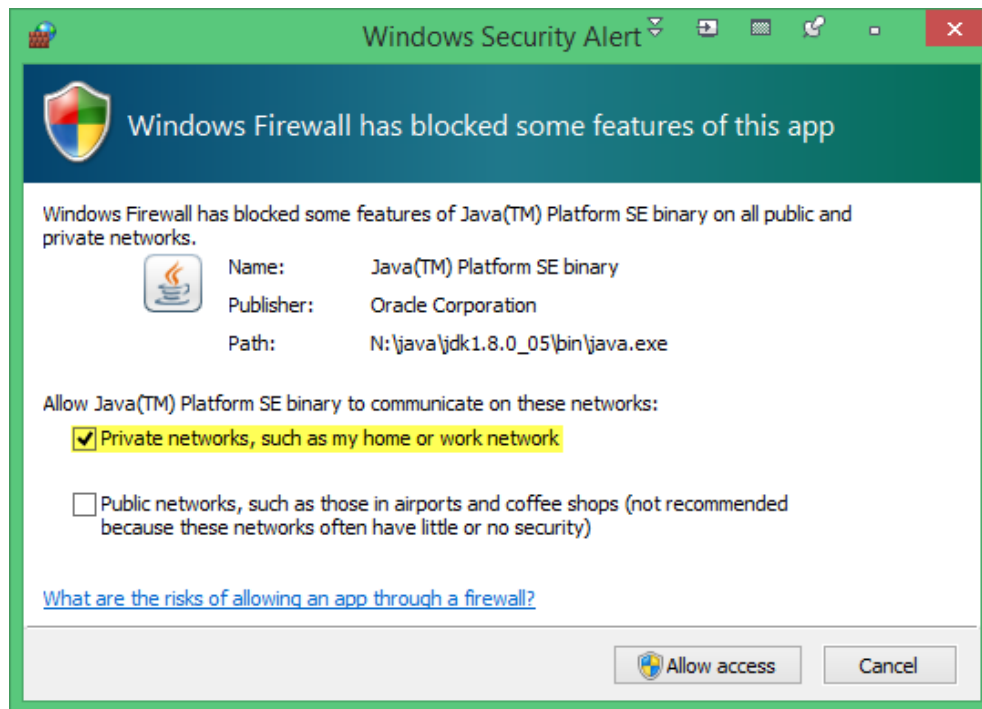
1. The Java Development Kit (JDK) contains development tools and the Java Runtime Environment (JRE) required for developing and running Java applications.
2. The WildFly server (formerly JBoss) will be used to host our web applications.
3. NetBeans will be the Integrated Development Environment (IDE) we use to construct the code files required by our web applications.

When downloading these three components, be sure to obtain the “latest stable” version.

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Security Notice

When installing/running any of the tools in this course you may see a notice like that below. I recommend limiting access to “Private networks,...” like shown in the dialog box.



Download and Install Latest Stable JDK

Navigate to the link and download the latest stable JDK. The latest stable at the time of this writing is 8u20 (version 8, update 102). It will likely be different when you are downloading. The JRE is the Java Runtime Engine which is required to run Java programs. It is included in the JDK. End users, not developers, will typically only want/need the JRE. However, developers use the JDK. Note that Java EE development requires the Java SE JDK (Java Developer's Kit).

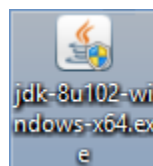
<http://www.oracle.com/technetwork/java/javase/downloads/jdk8-downloads-2133151.html>

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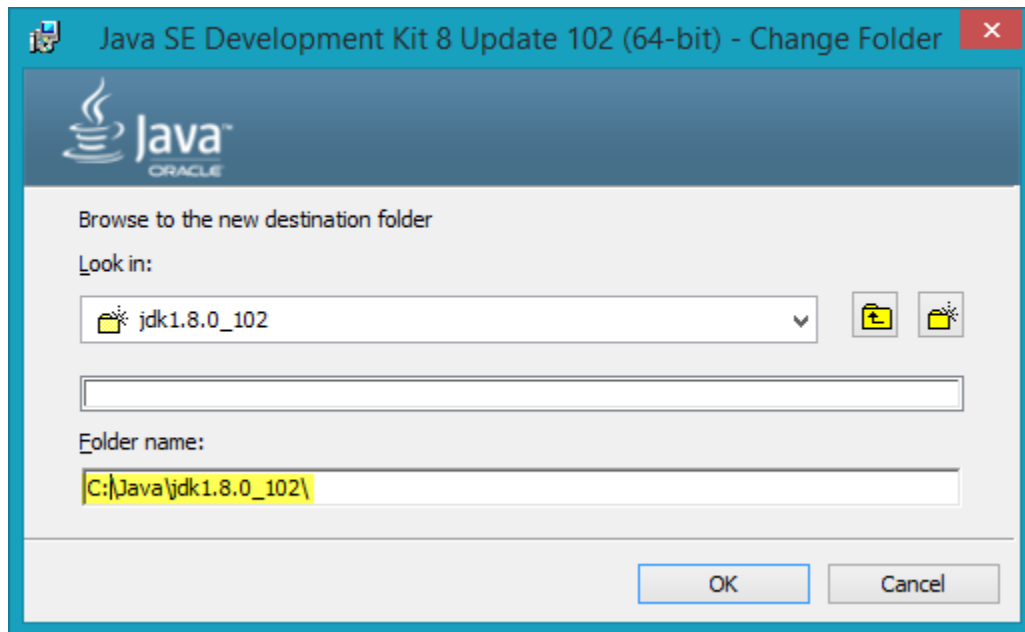
Accept the license agreement (if you agree). After accepting, a download arrow will appear adjacent to each entry. Select jdk-8u102-windows-x64.exe (or your appropriate download).

Java SE Development Kit 8u102		
You must accept the Oracle Binary Code License Agreement for Java SE to download this software.		
<input type="radio"/> Accept License Agreement <input checked="" type="radio"/> Decline License Agreement		
Product / File Description	File Size	Download
Linux x86	160.35 MB	jdk-8u102-linux-i586.rpm
Linux x86	175.03 MB	jdk-8u102-linux-i586.tar.gz
Linux x64	158.35 MB	jdk-8u102-linux-x64.rpm
Linux x64	173.03 MB	jdk-8u102-linux-x64.tar.gz
Mac OS X	227.35 MB	jdk-8u102-macosx-x64.dmg
Solaris SPARC 64-bit	139.59 MB	jdk-8u102-solaris-sparcv9.tar.Z
Solaris SPARC 64-bit	98.98 MB	jdk-8u102-solaris-sparcv9.tar.gz
Solaris x64	140.02 MB	jdk-8u102-solaris-x64.tar.Z
Solaris x64	96.24 MB	jdk-8u102-solaris-x64.tar.gz
Windows x86	189.2 MB	jdk-8u102-windows-i586.exe
Windows x64	194.68 MB	jdk-8u102-windows-x64.exe

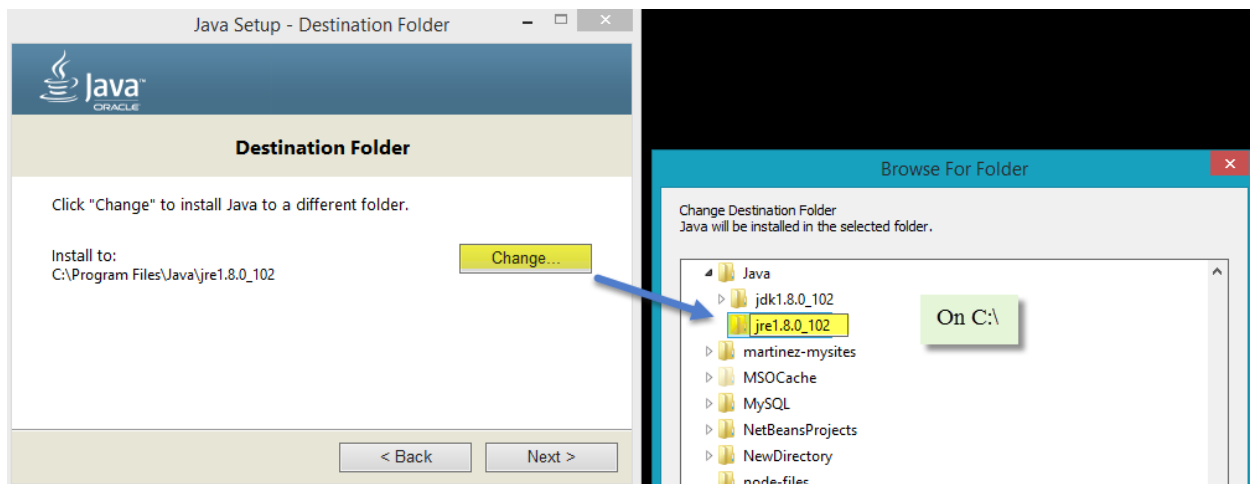
Navigate to the location where you have downloaded. Double-click the jdk-8u102-windows-x64.exe to install. The graphic below shows download to the desktop. I recommend installing to the location C:\Java\jdk1.8.0_102\ as shown.



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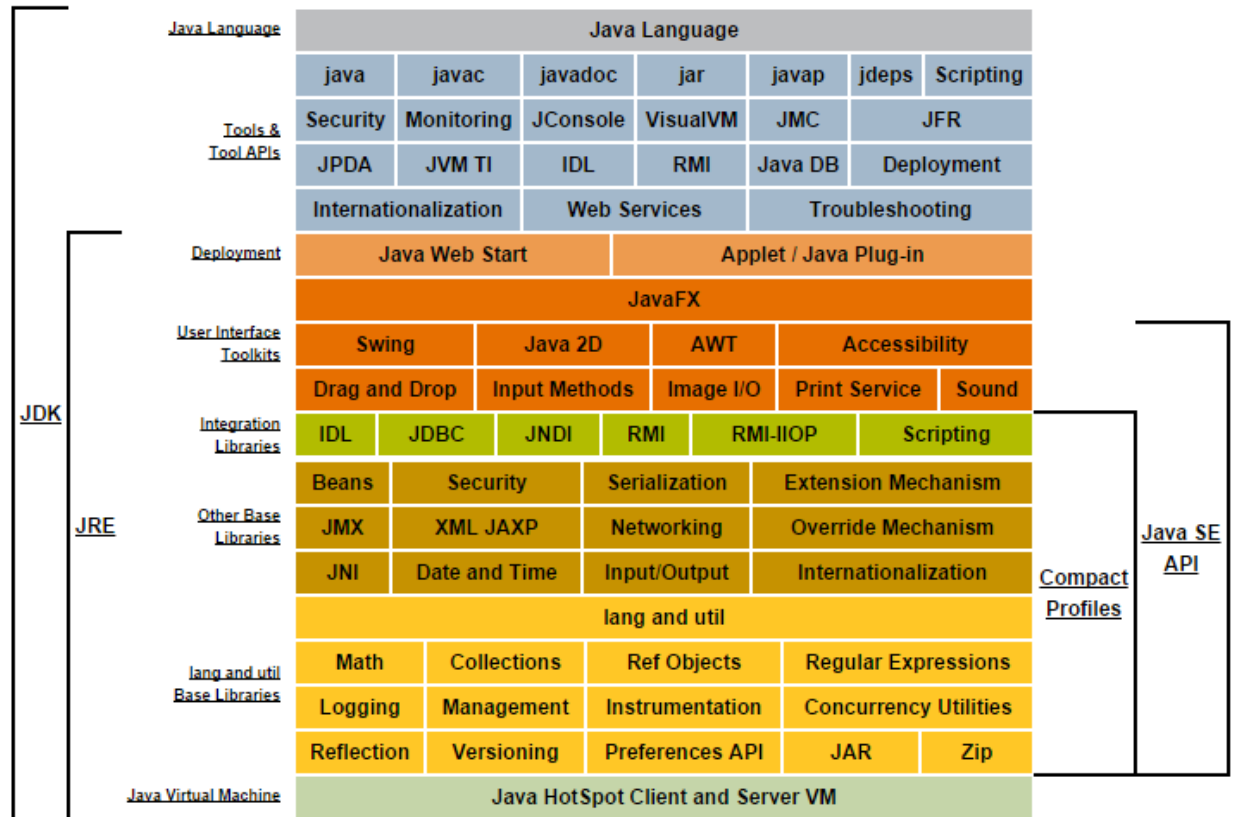
When prompted for the location of the JRE (Java Runtime Environment), like the JDK, install the JRE under C:\Java also



The “Success” dialog should appear after the installation. Select Next Steps.

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Selecting Next Steps above opens a web page with the following diagram. You will want to bookmark this page for future reference.



The latest stable JDK, including the JRE, has been installed. We are now ready to install WildFly and NetBeans.

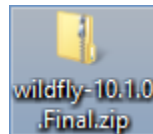
JDK-WildFly-NetBeans Setup Local

Download and Install Latest Stable WildFly

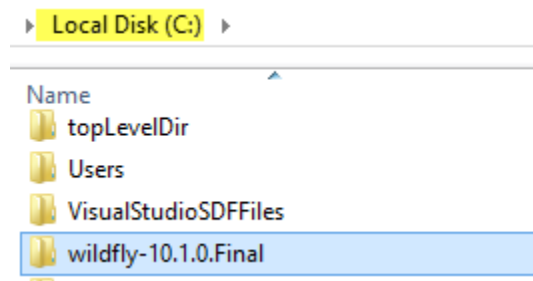
Download the WildFly .zip file from: <http://wildfly.org/downloads/> .
Be sure to select the latest “Final” version and NOT the “Alpha” version.

Version	Date	Description	License	Size	Format
10.1.0.Final	2016-08-19	Java EE7 Full & Web Distribution	LGPL	134 MB	ZIP

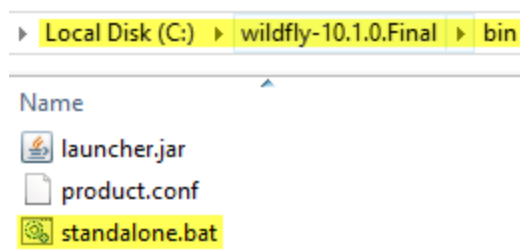
After the download is complete, move the .zip file wildfly-10.1.0.zip to the folder where you would like to install the server. I want to install to C:\ so I moved the file there.



Right-click and select | Extract All. The current location will appear. Unzipping can take a few minutes.

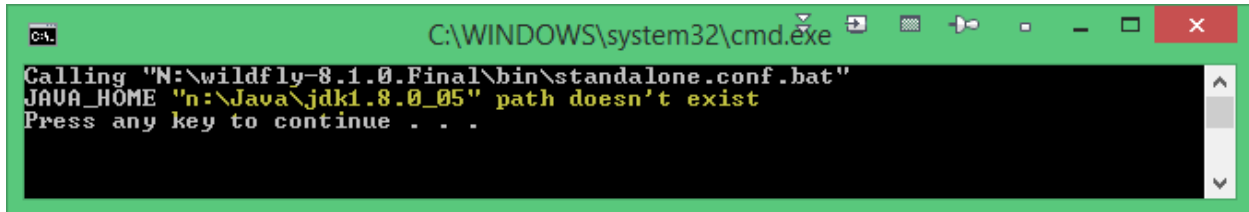


After the extraction is complete, double-click wildfly-10.1.0.Final\bin\standalone.bat and the command window opens.



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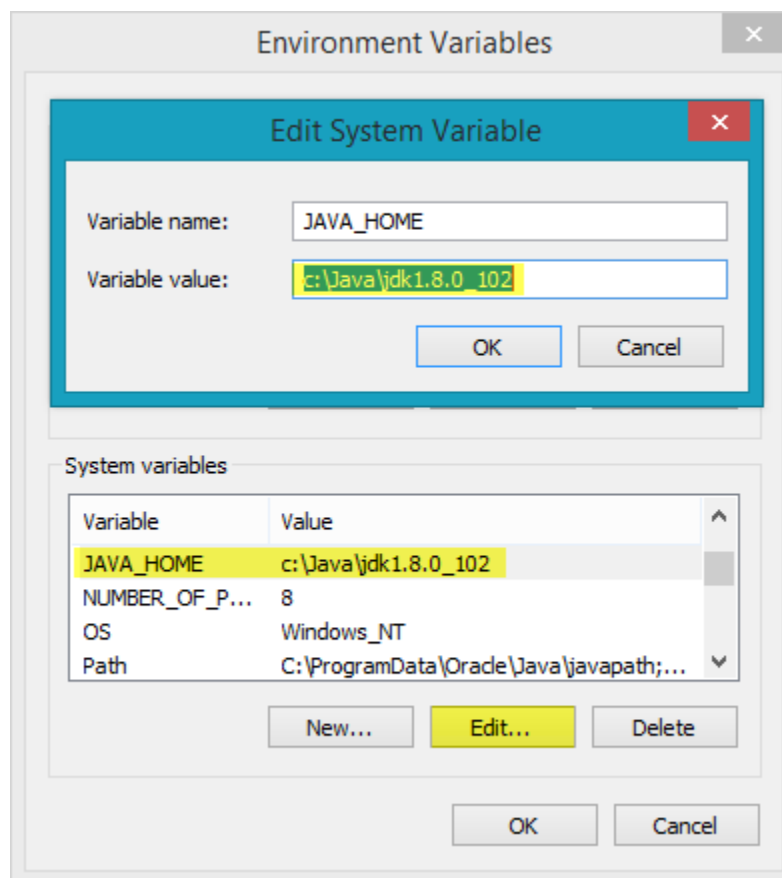
I get the error that the expected version of the JDK does not exist. I installed a later version of the JDK and will need to make the adjustment to the JAVA_HOME environment variable.



```

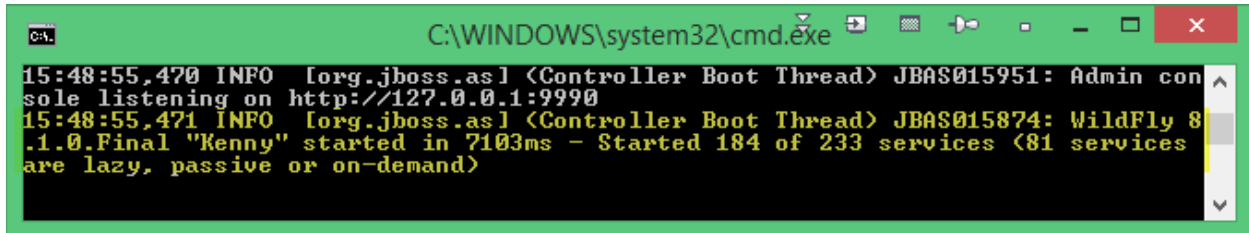
C:\WINDOWS\system32\cmd.exe
Calling "N:\wildfly-8.1.0.Final\bin\standalone.conf.bat"
JAVA_HOME "n:\Java\jdk1.8.0_05" path doesn't exist
Press any key to continue . . .
  
```

To update the JAVA_HOME environment variable, open the Control Panel | System | Advanced system settings | Environment Variables... | Edit or New | JAVA_HOME and change to or add the appropriate version | OK .



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After the JAVA_HOME environment variable is set correctly, double-click bin\standalone.bat again and the server running messages should appear in the command window. To stop the server at any time, Ctrl-c in the command window.



```

C:\WINDOWS\system32\cmd.exe
15:48:55,470 INFO [org.jboss.as] (Controller Boot Thread) JBoss015951: Admin console listening on http://127.0.0.1:9990
15:48:55,471 INFO [org.jboss.as] (Controller Boot Thread) JBoss015874: WildFly 8.1.0.Final "Kenny" started in 7103ms - Started 184 of 233 services (81 services are lazy, passive or on-demand)
  
```

Open browser and type <http://localhost:8080> in the browser URL address box. You should see the message: Welcome to WildFly – Your Wildfly is Running.



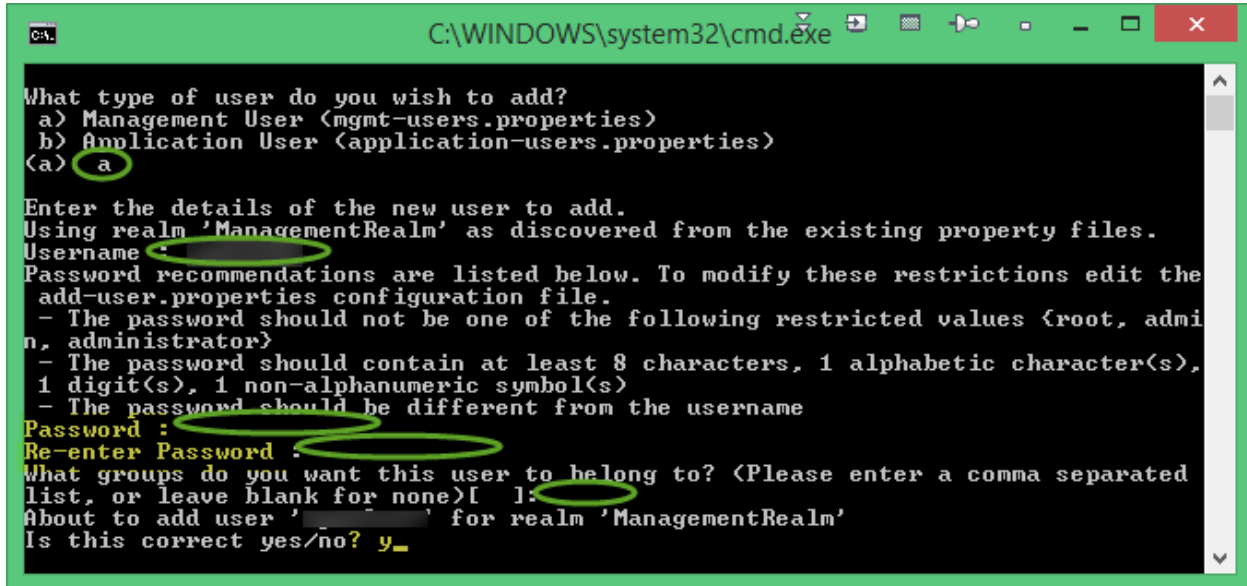
Welcome to WildFly 10

Your WildFly 10 is running.

Click Administration Console (but no users added yet to access admin). Add users by running wildfly-10.1.0.Final\bin\add-user.bat (double-click to run). For your local WildFly “admin” account, I recommend using a username and password of your choosing – username: perhaps your first name password: your choice

JDK-WildFly-NetBeans Setup Local

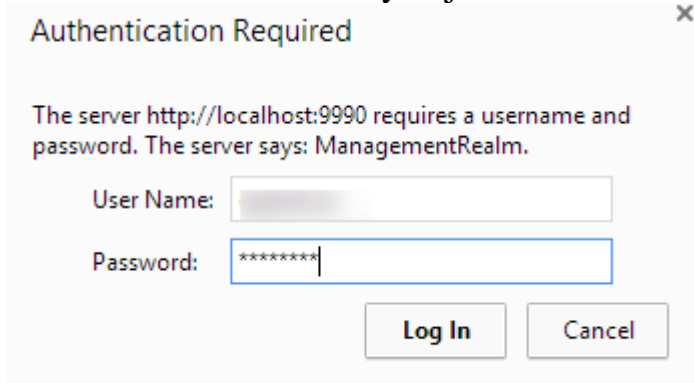
1. Navigate to c:\wildfly-10.1.0.Final\bin and double-click **add-user.bat**.
2. Enter “a” to create a “Management User”.
3. Username (perhaps first name) and password.
4. Groupname (same as username) for the groupname.
5. Enter “yes” for “Is this correct?”
6. Enter “no” for “... EJB calls.” and then any key to exit.



```

C:\WINDOWS\system32\cmd.exe
What type of user do you wish to add?
a) Management User <mgmt-users.properties>
b) Application User <application-users.properties>
(a) a
Enter the details of the new user to add.
Using realm 'ManagementRealm' as discovered from the existing property files.
Username a
Password recommendations are listed below. To modify these restrictions edit the
add-user.properties configuration file.
- The password should not be one of the following restricted values {root, admin, administrator}
- The password should contain at least 8 characters, 1 alphabetic character(s), 1 digit(s), 1 non-alphanumeric symbol(s)
- The password should be different from the username
Password : a
Re-enter Password : a
What groups do you want this user to belong to? (Please enter a comma separated list, or leave blank for none) [ ] a
About to add user 'a' for realm 'ManagementRealm'
Is this correct yes/no? y_
  
```

To access the web-based WildFly Admin page, go to <http://localhost:9990> and enter the credentials that you just added for the Management User.



Authentication Required

The server <http://localhost:9990> requires a username and password. The server says: ManagementRealm.

User Name:

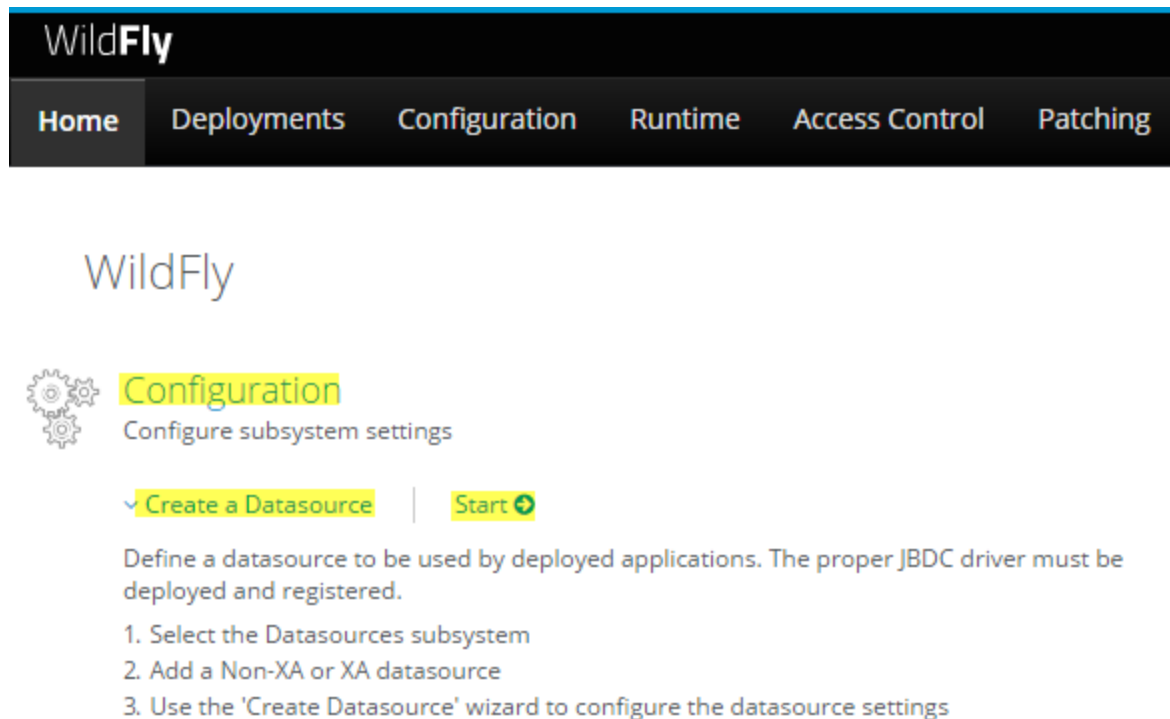
Password:

The WildFly Admin page opens.

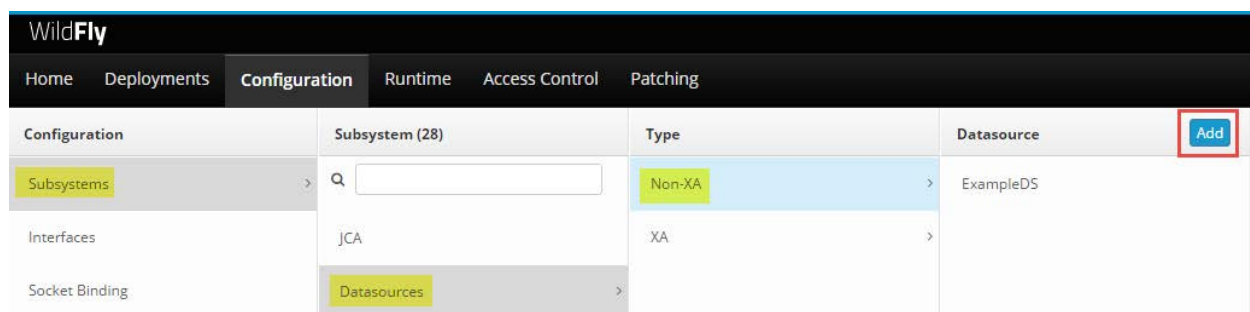
Note: for the course INEW 2338, we use the MySQL database. We will come back to the local Admin page in the tutorial “MySQL in WildFly Setup Local”. In that

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tutorial, we will register the mysql...jar file with the WildFly server using the jboss-cli.bat tool. Then we will use WildFly Admin to add the datasource within WildFly. To take a glimpse of the process to add a datasource select Start under Configuration | Create a Datasource.



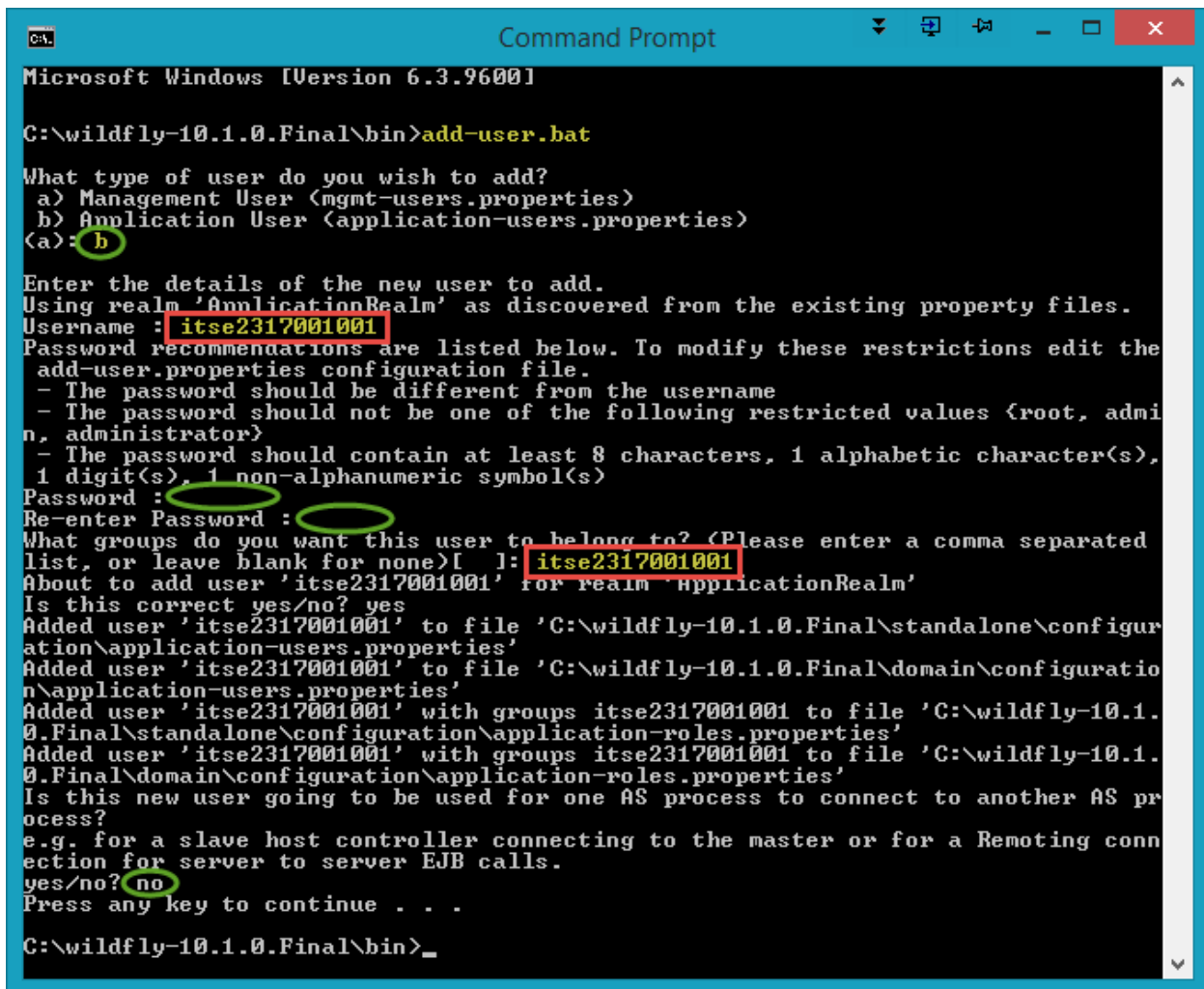
That brings us to the JDBC Datasources page. The ExampleDS is a sample datasource preinstalled with WildFly and should not be modified. In the “MySQL in WildFly Setup Local” tutorial we will select Add in the JDBC Resources page to add a resource for our database. This could be done now but it is preferable to test the connection as we create it. To test the connection, we need MySQL running and we need the database created in MySQL that is part of the datasource.



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Before leaving WildFly, it is a good time to add an “Application User” that will be used to access the web application while it is running.

1. Navigate to c:\wildfly-10.1.0.Final\bin and run add-user.bat.
2. Enter “b” to create an “Application User”.
3. Enter your username (see red box) and password.
4. Enter your username for the groupname.
5. Enter “yes” for “Is this correct?”
6. Enter “no” for “... EJB calls.” and then any key to exit.



```

C:\wildfly-10.1.0.Final\bin>add-user.bat

What type of user do you wish to add?
  a) Management User <mgmt-users.properties>
  b) Application User <application-users.properties>
(a)= b

Enter the details of the new user to add.
Using realm 'ApplicationRealm' as discovered from the existing property files.
Username : itse2317001001
Password recommendations are listed below. To modify these restrictions edit the
  add-user.properties configuration file.
  - The password should be different from the username
  - The password should not be one of the following restricted values {root, admin, administrator}
  - The password should contain at least 8 characters, 1 alphabetic character(s), 1 digit(s), 1 non-alphanumeric symbol(s)
Password : itse2317001001
Re-enter Password : itse2317001001
What groups do you want this user to belong to? (Please enter a comma separated list, or leave blank for none)[] 1: itse2317001001
About to add user 'itse2317001001' for realm 'ApplicationRealm'
Is this correct yes/no? yes
Added user 'itse2317001001' to file 'C:\wildfly-10.1.0.Final\standalone\configuration\application-users.properties'
Added user 'itse2317001001' to file 'C:\wildfly-10.1.0.Final\domain\configuration\application-users.properties'
Added user 'itse2317001001' with groups itse2317001001 to file 'C:\wildfly-10.1.0.Final\standalone\configuration\application-roles.properties'
Added user 'itse2317001001' with groups itse2317001001 to file 'C:\wildfly-10.1.0.Final\domain\configuration\application-roles.properties'
Is this new user going to be used for one AS process to connect to another AS process?
e.g. for a slave host controller connecting to the master or for a Remoting connection for server to server EJB calls.
yes/no? no
Press any key to continue . . .

C:\wildfly-10.1.0.Final\bin>_
  
```

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Download and Install Latest NetBeans

Why NetBeans? While there are a number of other popular IDEs for Java EE development such as IntelliJ and Eclipse, NetBeans is a standard choice for Java and PHP development.













NetBeans releases are in sync with SE JDK and EE JDK releases which means that NetBeans is current with the latest versions of Java on same days that Java releases are published. Other IDE's typically are not current until months after Java releases. NetBeans is also managed by Oracle, the same company that manages the Java updates.

Download NetBeans from: <https://netbeans.org/downloads/>

Select the Java EE package (or the 'All' package if you plan to work with any of the other supported languages). Also, be sure to select the latest stable version (8.2 is the latest stable at the time of this writing). If version 9.x is the latest stable, download and install it.

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NetBeans IDE 8.2 Download

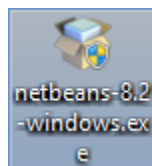
Supported technologies *	Java SE	Java EE
 NetBeans Platform SDK	•	•
 Java SE	•	•
 Java FX	•	•
 Java EE		•
 Java ME		
 HTML5/JavaScript		•
 PHP		
 C/C++		
 Groovy		
 Java Card™ 3 Connected		
Bundled servers		
 GlassFish Server Open Source Edition 4.1.1		•
 Apache Tomcat 8.0.27		•

[Download](#)
[Download](#)

Free, 95 MB

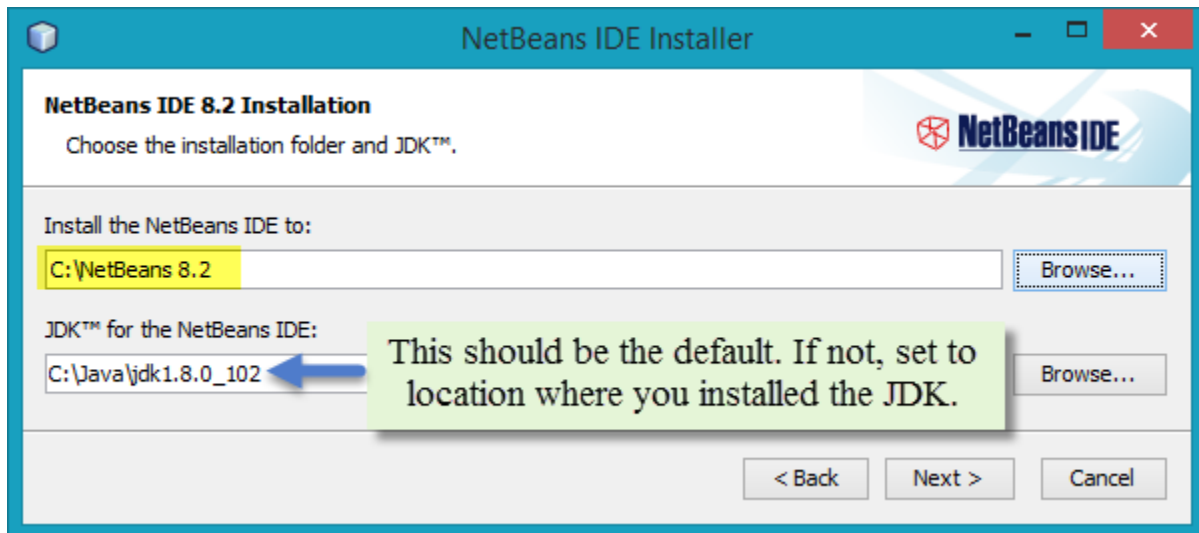
Free, 197 MB

Navigate to the location where you downloaded the .exe and double-click it.



Choose to install at “C:\NetBeans 8.2” (or appropriate version number).

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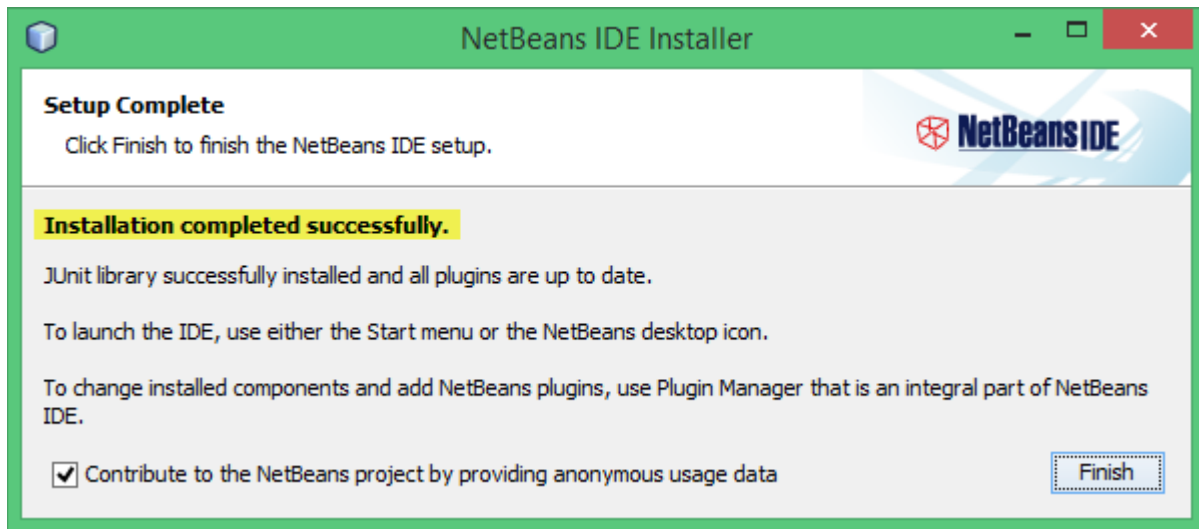


I recommend not installing either Apache Tomcat or Glassfish. Both are Java web servers (containers) that can be used to host Java web-based applications. We will use WildFly in this course. Oracle has announced that the community (free) version of Glassfish ended with version 4.x.

As of 2016, Tomcat has ~40% of the market, WildFly ~26% and growing. In the past, WildFly has been compliant with the latest version of Java Enterprise Edition (JEE) on the day that version is released. Tomcat compliance comes much later. WildFly is known as a very 'thin' implementation and is known for its speed. Also, in my experience, CDI (Context Dependency Injection) is easier to manage (for multiple students) in WildFly. That becomes relevant in INEW 2338, the Advanced Java course.

After a few minutes NetBeans should install successfully. Select Finish.

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Add WildFly Server to NetBeans

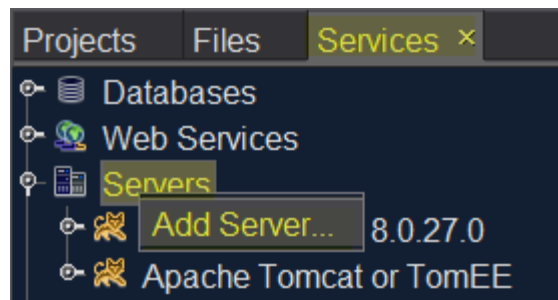
In the Services group, R-click Servers and select Add Server. (Note: WildFly used to be available as a plugin but is now integrated directly with NetBeans.)

WildFly Application Server - plugin detail

Plugin for WildFly Application Server.

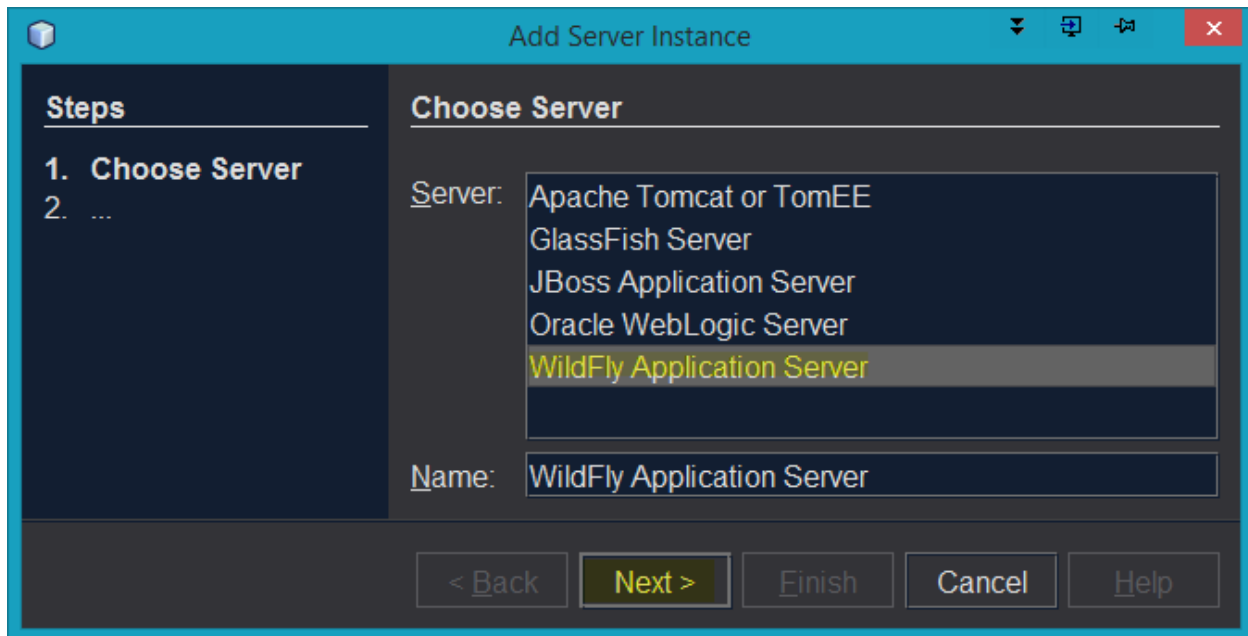
"DISCONTINUED As of NetBeans 8.1 WildFly plugin became an internal part of NetBeans IDE."

Add WildFly Server to NetBeans...

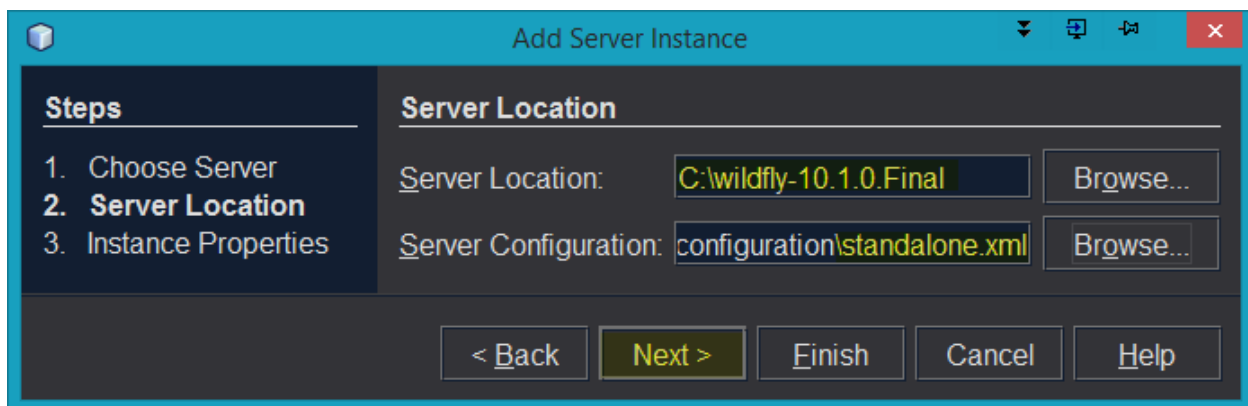


Select Wildfly Application Server.

JDK-WildFly-NetBeans Setup Local

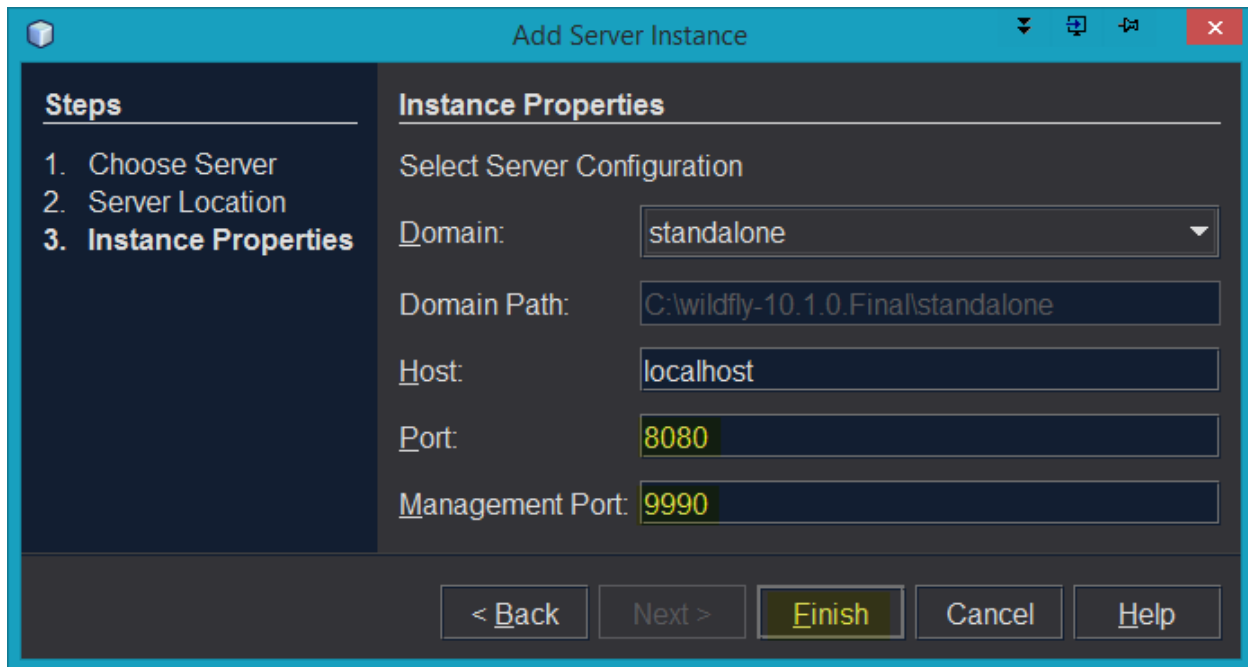


Enter appropriate Server location and Server Configuration (I recommend standalone.xml instead of the standalone-full.xml which is the default).

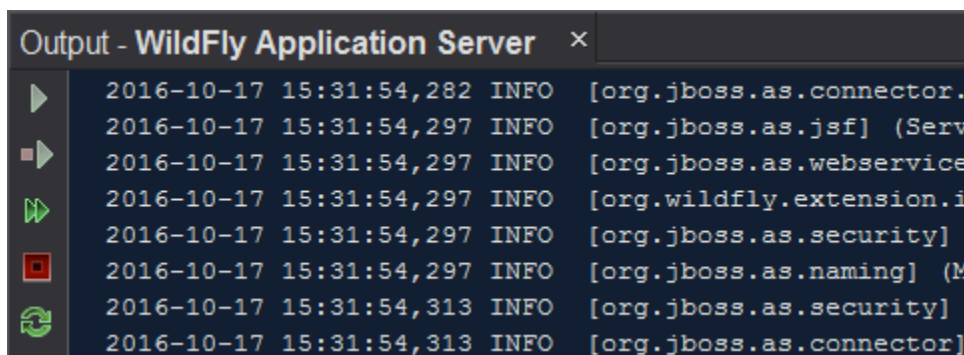


Enter appropriate Instance Properties. If you are running another Java web server on your machine then you may need to alter the Port numbers listed. That is one of the reasons I recommended not installing Tomcat or Glassfish above. Select Finish.

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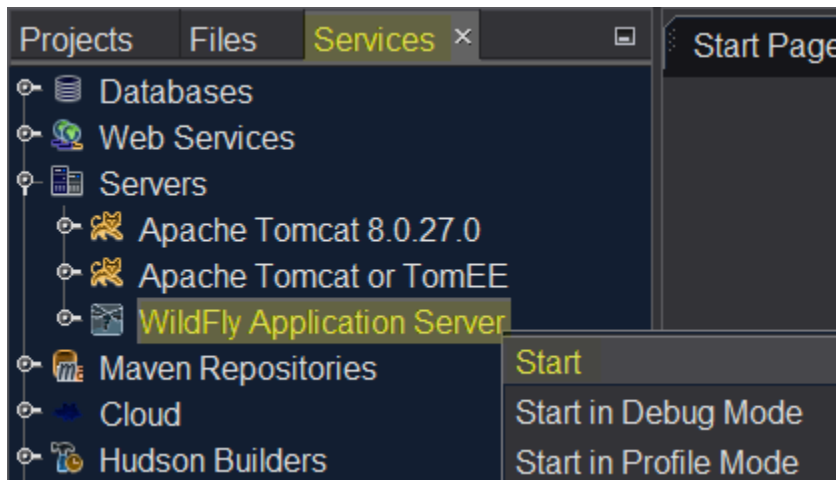


Wildfly is configured in NetBeans after clicking Finish button. With most installations, WildFly will start automatically after the installation. This can be observed in the WildFly Application Server output window shown below. Notice there are also buttons to start and stop the server on the left of that window.



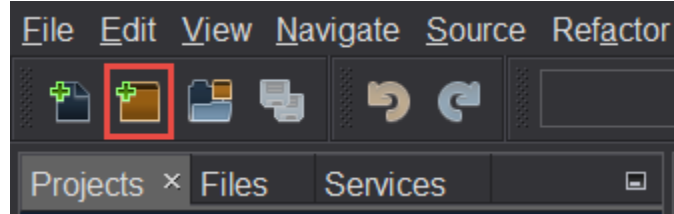
WildFly can also be started/stopped by R-clicking on Servers | WildFly Application Server | Start. WildFly will also start when selecting Run for an application that has WildFly assigned as its server.

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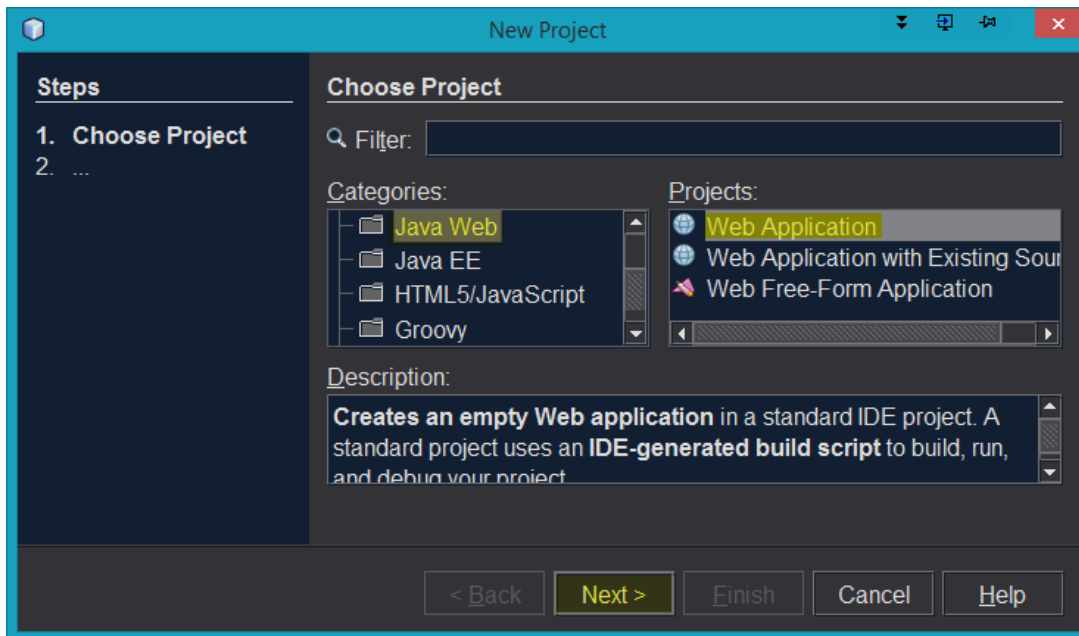
Create a Web Application Project in NetBeans

We are now ready to create a new NetBeans project. Click the Create a New project button. (Alternatively, File | New Project)



In the next dialog box make the following selections.

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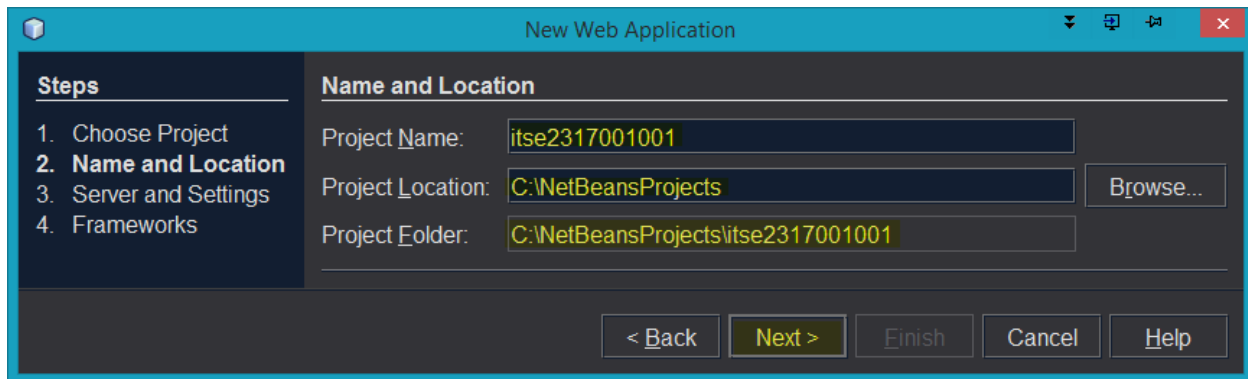
Set the name and location of your web application. **Name the project your username for the course**. Unlike many other courses, the project names are CRUCIAL in this course. Your username can be located in Blackboard | My Grades & Due Dates | Website Credentials. Your username will be of the form (but slightly different)itse2317001001 or inew001001.




Click the image that looks like this in "My Grades & Due Dates".

Later, you will use the project you are currently creating as the home project of your student website.

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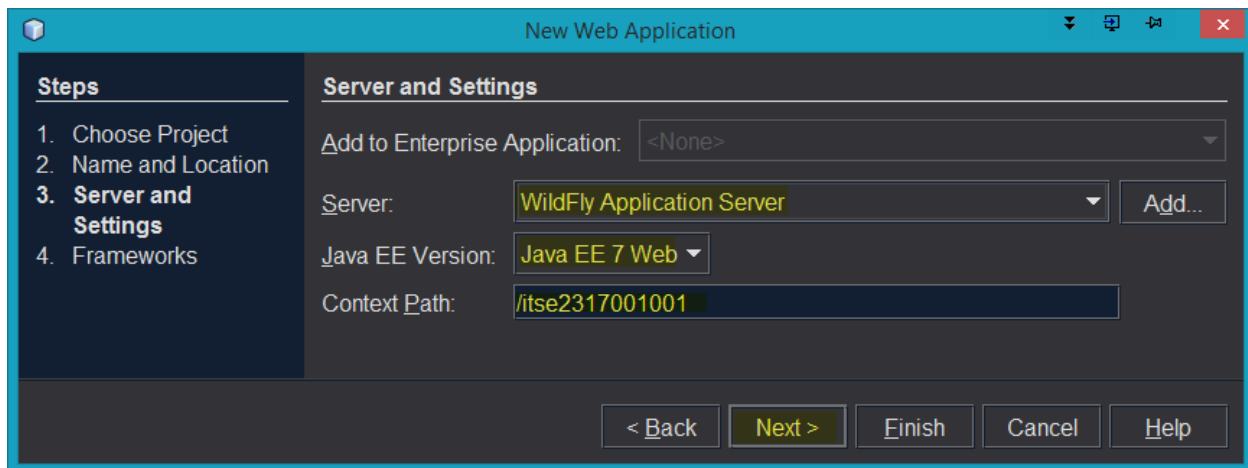


If this is the first time creating a web application in this installation of NetBeans, you may receive a warning at the bottom of the next dialog box. However, you should not see this warning since you registered the WildFly server above.

 No servers are registered in the IDE. To register a server, click the "Add..." button.

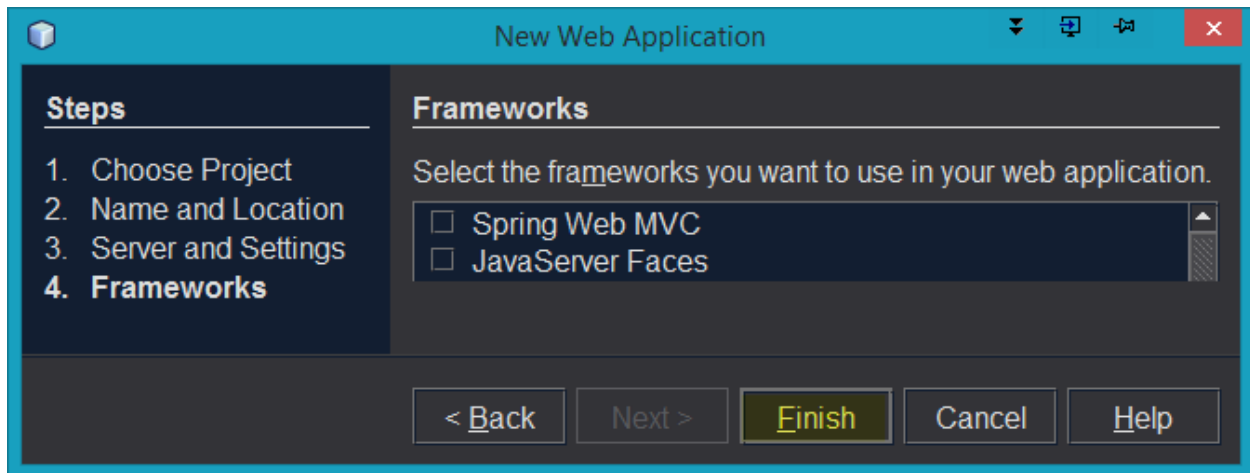
If you do see the warning message, click the Add button to register a WildFly server using the appropriate settings previously covered in this tutorial.

Accept the default settings in the next window if like that shown and select Next.



No frameworks are required for this project so select Finish on the frameworks dialog.

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A starting index.html page is created like below. Close and delete that file (R-click | Delete). We code the replacement next.

```

1  <!DOCTYPE html>
2  <!--
3   To change this license header, choose License Headers in Project Properties.
4   To change this template file, choose Tools | Templates
5   and open the template in the editor.
6  -->
7  <html>
8  <head>
9      <title>TODO supply a title</title>
10     <meta charset="UTF-8">
11     <meta name="viewport" content="width=device-width, initial-scale=1.0">
12 </head>
13 <body>
14     <div>TODO write content</div>
15 </body>
16 </html>

```

Create the file index.jsp by R-Clicking on the project name | New | JSP and name it index.jsp. This will be the home page of our remote site. Code the content shown and make the appropriate replacements on lines 8 and 13.

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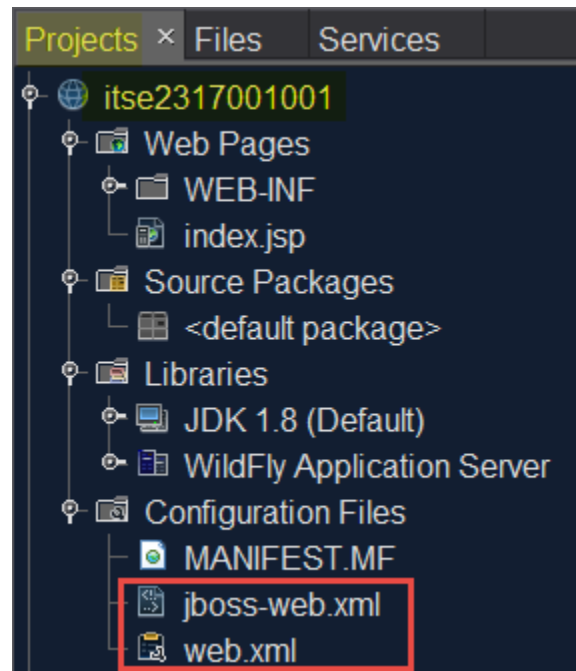
```

1  <!DOCTYPE html>
2  <%@page contentType="text/html" pageEncoding="UTF-8"%>
3  <%@page import="java.io.*,java.util.*, javax.servlet.*" %>
4  <!-- index.jsp @author R.L. Martinez, Ph.D. -->
5  <html>
6  <head>
7  <title>
8      ITSE 2317 - Your Name Here - Home Page
9  </title>
10 </head>
11 <body>
12     <hr>
13     <h1>ITSE 2317 Intermediate Java - Your Name Here</h1>
14     <a href="asg09">Assignment 09</a><br/><br/>
15     <a href="asg10">Assignment 10</a><br/><br/>
16     <a href="asg11">Assignment 11</a><br/><br/>
17     <a href="asg12">Assignment 12</a><br/><br/>
18     <%
19         Date date = new Date();
20         out.print( "<h2 align=\"center\">" +date.toString()+"</h2>" );
21     %>
22     <hr>
23 </body>
24 </html>

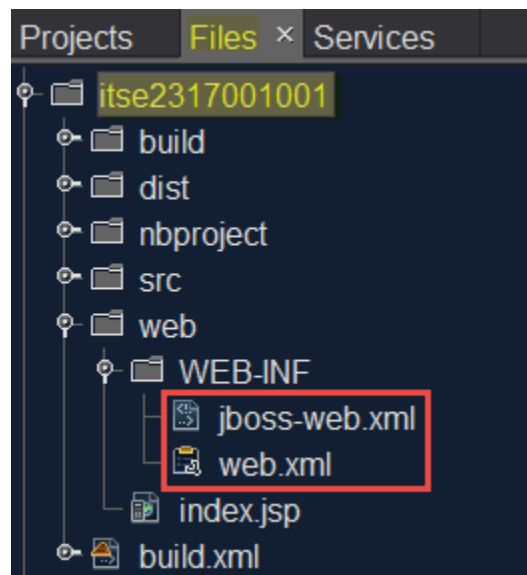
```

With the Projects group selected, a *logical view* of the project is displayed. Your project structure should look like the following. However, you will need to add the two files, jboss-web.xml and web.xml. Instructions for doing that follow.

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Note: the *physical view* (the actual directory structure and file contents) of each project can be observed by selecting the Files group as shown:

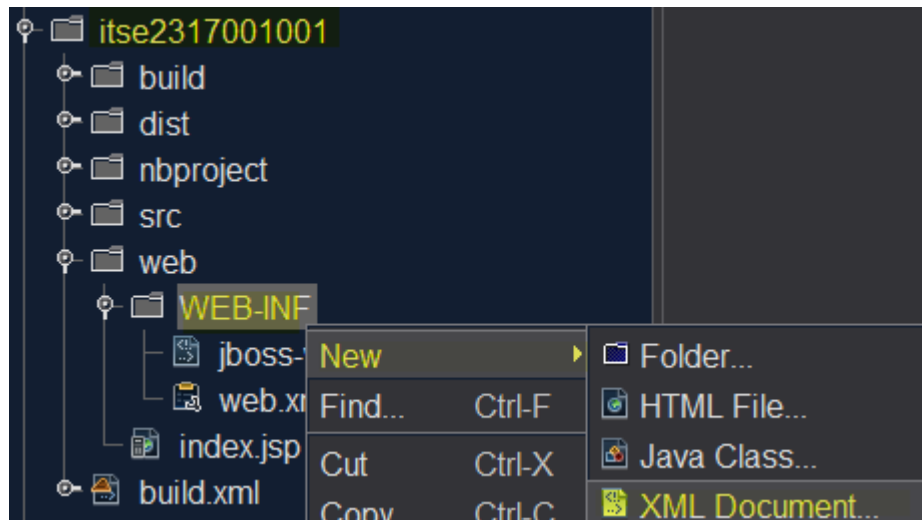


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Adding the files jboss-web.xml and web.xml

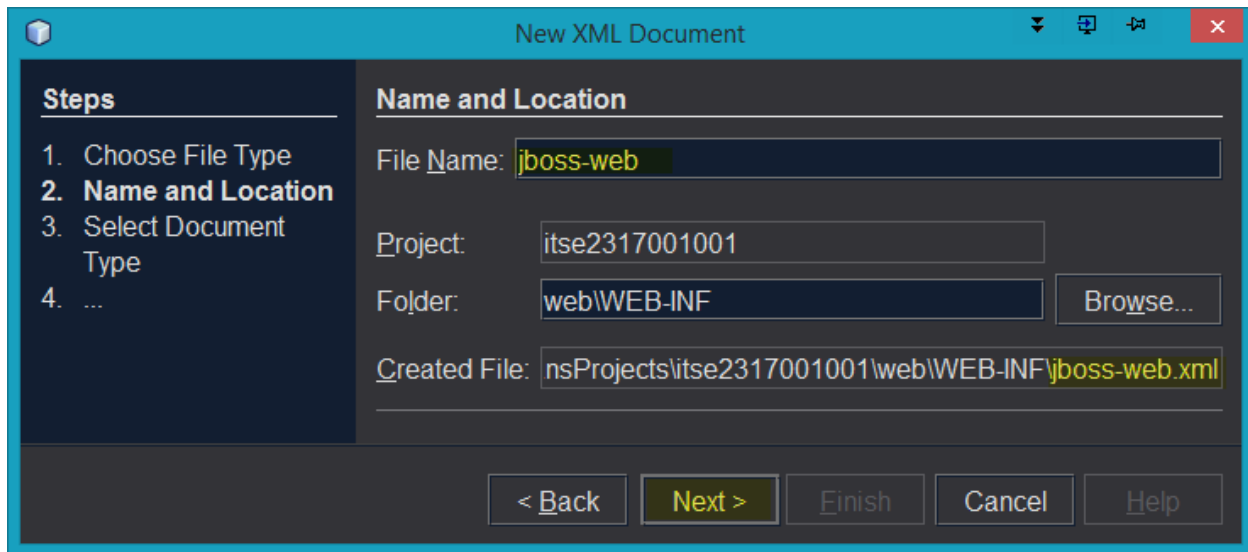
Each of the five projects in the course will contain the two files: jboss-web.xml and web.xml. These files will be essentially identical among the five projects with the exception of the entries with red underlines.

To add two new files to the project do the following. Navigate to the Files (or Project) group | Expand itse2317001001 | R-click WEB-INF | New | XML Document

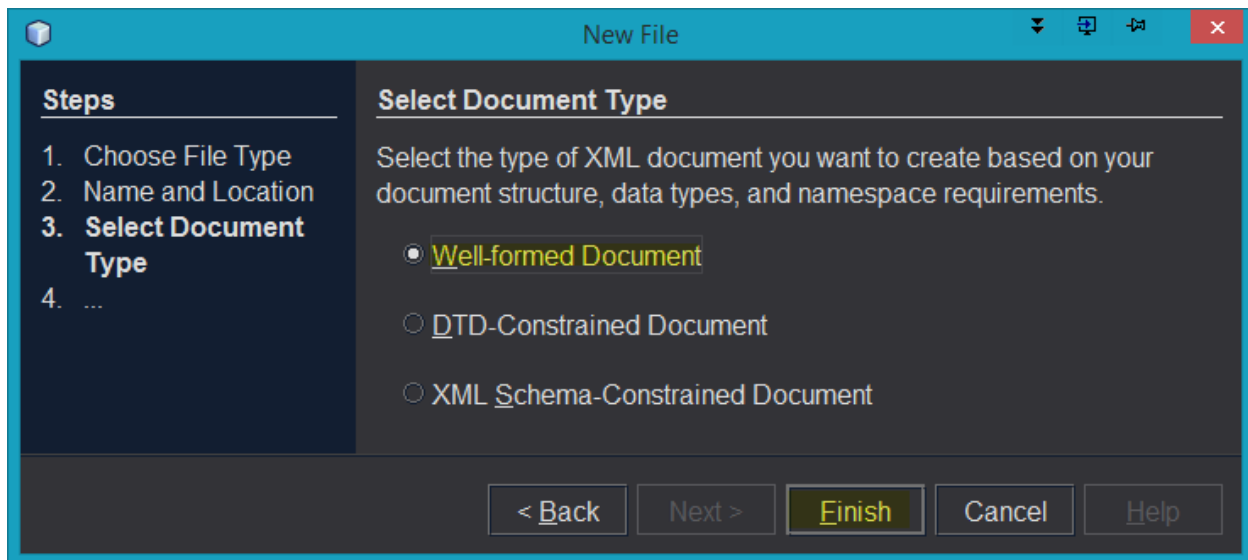


Enter jboss-web in the File Name box. Don't include the .xml file extension since that is added automatically by selecting the XML document type to create. Select Next.

JDK-WildFly-NetBeans Setup Local

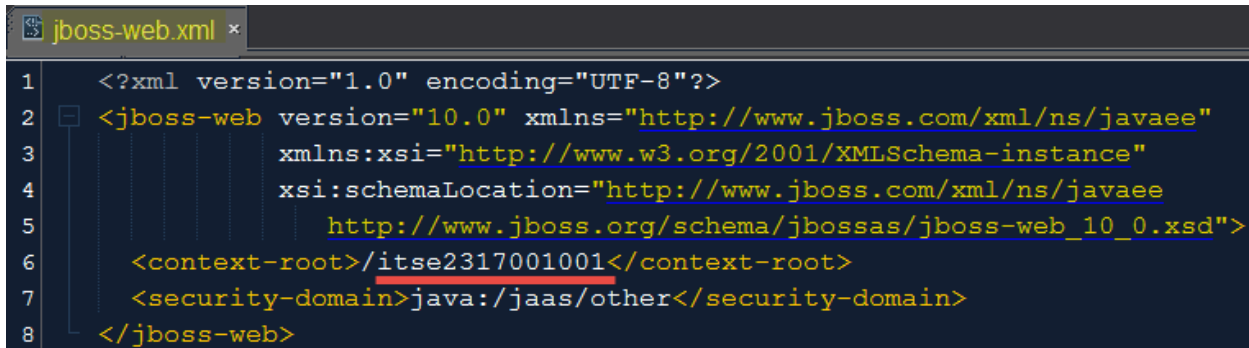


Leave the default as Well-formed Document in the Document Type dialog. Select Finish.



Replace the default contents of the new jboss-web.xml file with the following. Use your own username for the username that is underlined in red.

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A screenshot of a NetBeans IDE window showing the contents of a file named 'jboss-web.xml'. The file is opened in a tab at the top. The XML content is as follows:

```
1 <?xml version="1.0" encoding="UTF-8"?>
2 <jboss-web version="10.0" xmlns="http://www.jboss.com/xml/ns/javaee"
3   xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
4   xsi:schemaLocation="http://www.jboss.com/xml/ns/javaee
5     http://www.jboss.org/schema/jbossas/jboss-web_10_0.xsd">
6   <context-root>/itse2317001001</context-root>
7   <security-domain>java:/jaas/other</security-domain>
8 </jboss-web>
```

Create another XML Document file using the same steps as above but name it web.xml. Replace the default contents of web.xml with the following. Replace the usernames unlined with your own username.

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```


web.xml x
1  <?xml version="1.0" encoding="UTF-8"?>
2  <web-app version="3.0" xmlns="http://java.sun.com/xml/ns/javaee"
3      xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
4      xsi:schemaLocation="http://java.sun.com/xml/ns/javaee
5          http://java.sun.com/xml/ns/javaee/web-app_3_0.xsd">
6
7      <welcome-file-list>
8          <welcome-file>index.jsp</welcome-file>
9      </welcome-file-list>
10
11     <security-constraint>
12         <web-resource-collection>
13             <web-resource-name>HtmlAuth</web-resource-name>
14             <description>application security constraints</description>
15             <url-pattern>/*</url-pattern>
16             <http-method>GET</http-method>
17             <http-method>POST</http-method>
18         </web-resource-collection>
19         <auth-constraint>
20             <role-name>itse2317001001</role-name>
21             <role-name>professor</role-name>
22         </auth-constraint>
23     </security-constraint>
24
25     <login-config>
26         <auth-method>BASIC</auth-method>
27         <realm-name>ApplicationRealm</realm-name>
28     </login-config>
29
30     <security-role>
31         <role-name>itse2317001001</role-name>
32     </security-role>
33     <security-role>
34         <role-name>professor</role-name>
35     </security-role>
36
37 </web-app>

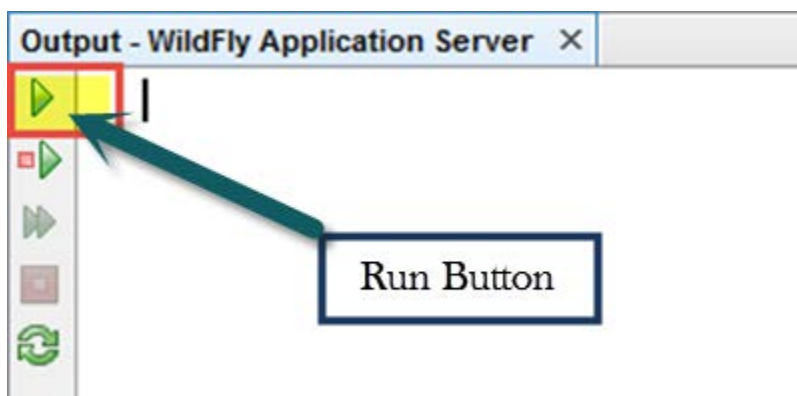
```

JDK-WildFly-NetBeans Setup Local

Run a Web Application Project in NetBeans

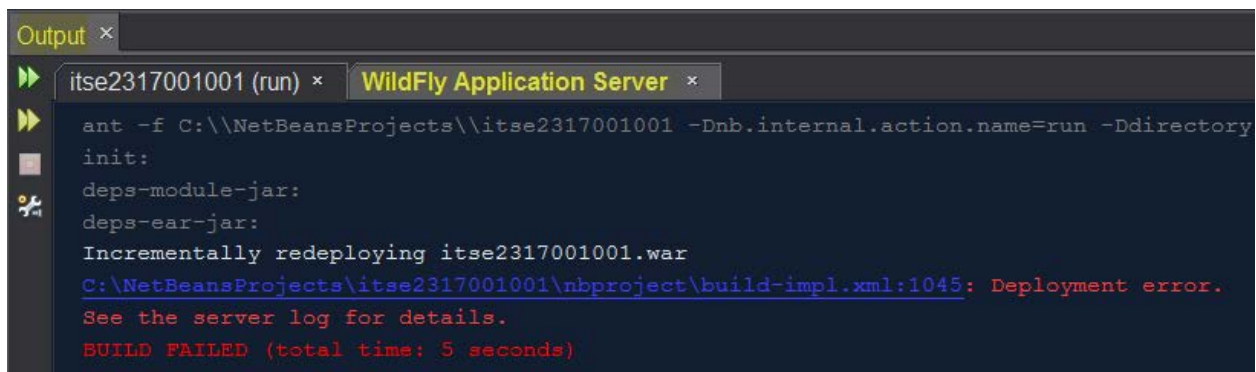
We can run most web application projects in NetBeans by selecting the Run Project  button in the top toolbar. Projects can also be run by R-clicking the project name | Run. When web projects are run, their associated server should start.

The WildFly server can also be started by selecting the Run Server  button in the bottom Output panel.



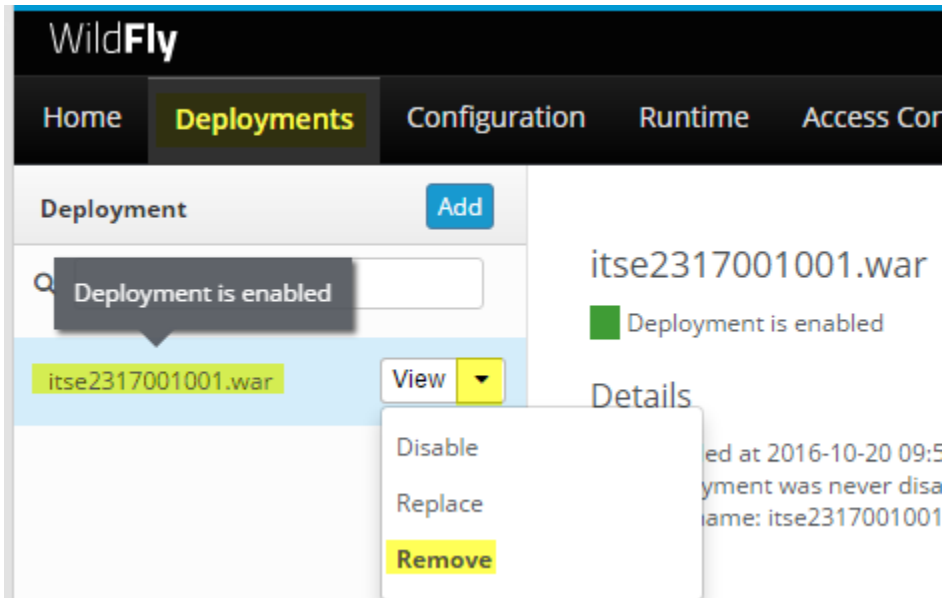
WildFly is automatically started when the run project button is selected provided you have specified WildFly as the web server for your project which was done above.

After running the application, if you see an error like that below proceed to the next step.



JDK-WildFly-NetBeans Setup Local

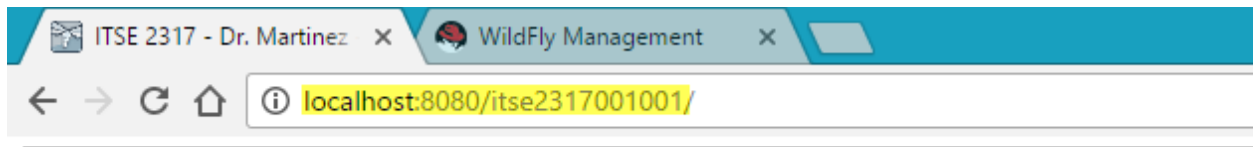
If you see an error when attempting to re-run an application, you will likely need to Remove a previously deployed WAR file by opening a browser and entering <http://localhost:9990>. That will open the WildFly Web Admin tool like shown previously in this tutorial. Remove the deployment as shown.



After removing the deployment, retry running the application. With the WildFly server running, you can also access the application via the URL <http://localhost:8080/itse2317001001> where 'itse2317001001' is your username.

If you are presented with a login screen at this point, use the “Application User” credentials created above with your username and password.

JDK-WildFly-NetBeans Setup Local



ITSE 2317 Intermediate Java - Dr. Martinez

[Assignment 09](#)

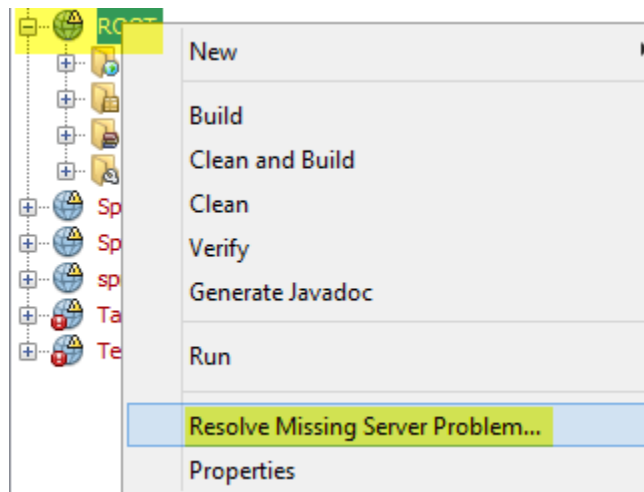
[Assignment 10](#)

[Assignment 11](#)

[Assignment 12](#)

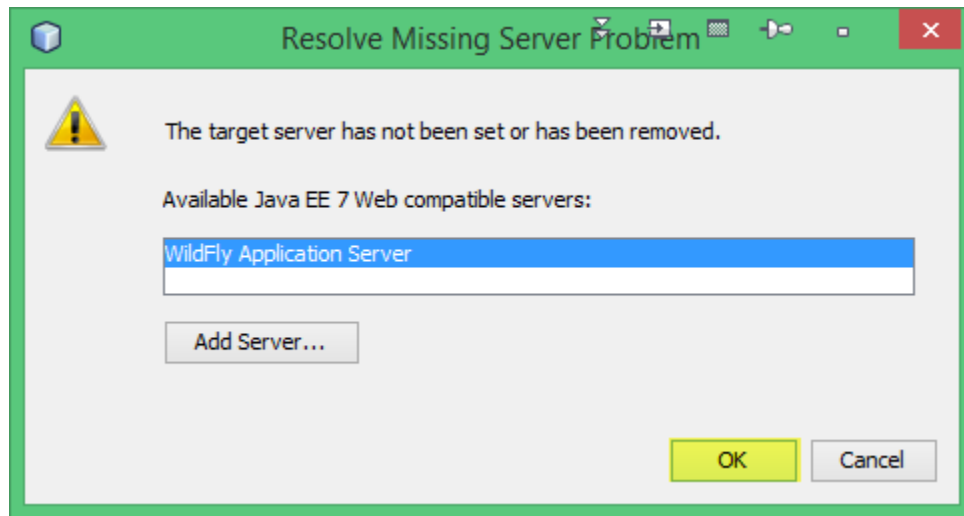
Assign the WildFly Server to an Existing NetBeans Project

Each web application requires an assigned server to run. To assign a server, or resolve a “Missing Server Problem”, R-click the project. Select Properties to assign a new server or change servers and select “Resolve Missing Server Problem” if a previously existing server is no longer available.



Select WildFly Application Server. Select OK. Now WildFly is assigned as the project’s server and will start when the project is run (if the server is not already running).

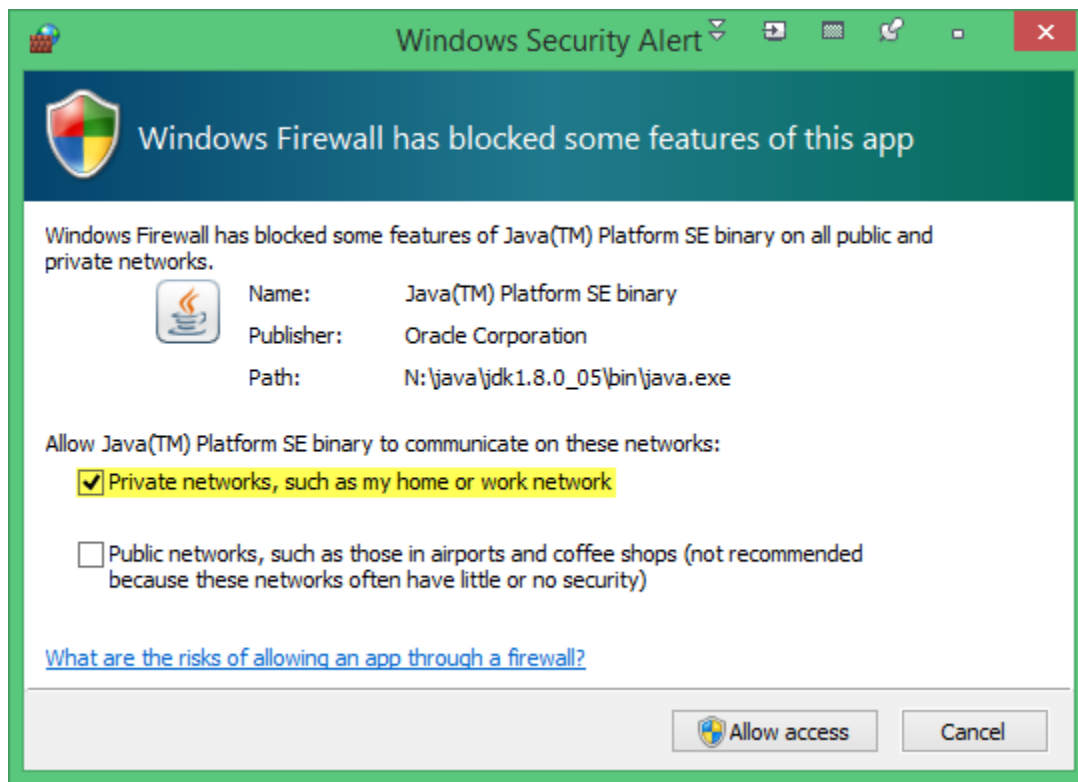
JDK-WildFly-NetBeans Setup Local



If a web server has NOT been assigned to the project, R-click the project name in the Project window to specify the server and select “Specify Web Server” at the bottom of the menu or in Properties.

If you see the dialog below, I strongly recommend that the “Private networks...” option be selected for the development environment to operate more securely. The “Name:” specified in the dialog may be “NetBeans IDE” instead of Java as shown. In either case, select “Private networks” and then “Allow access”.

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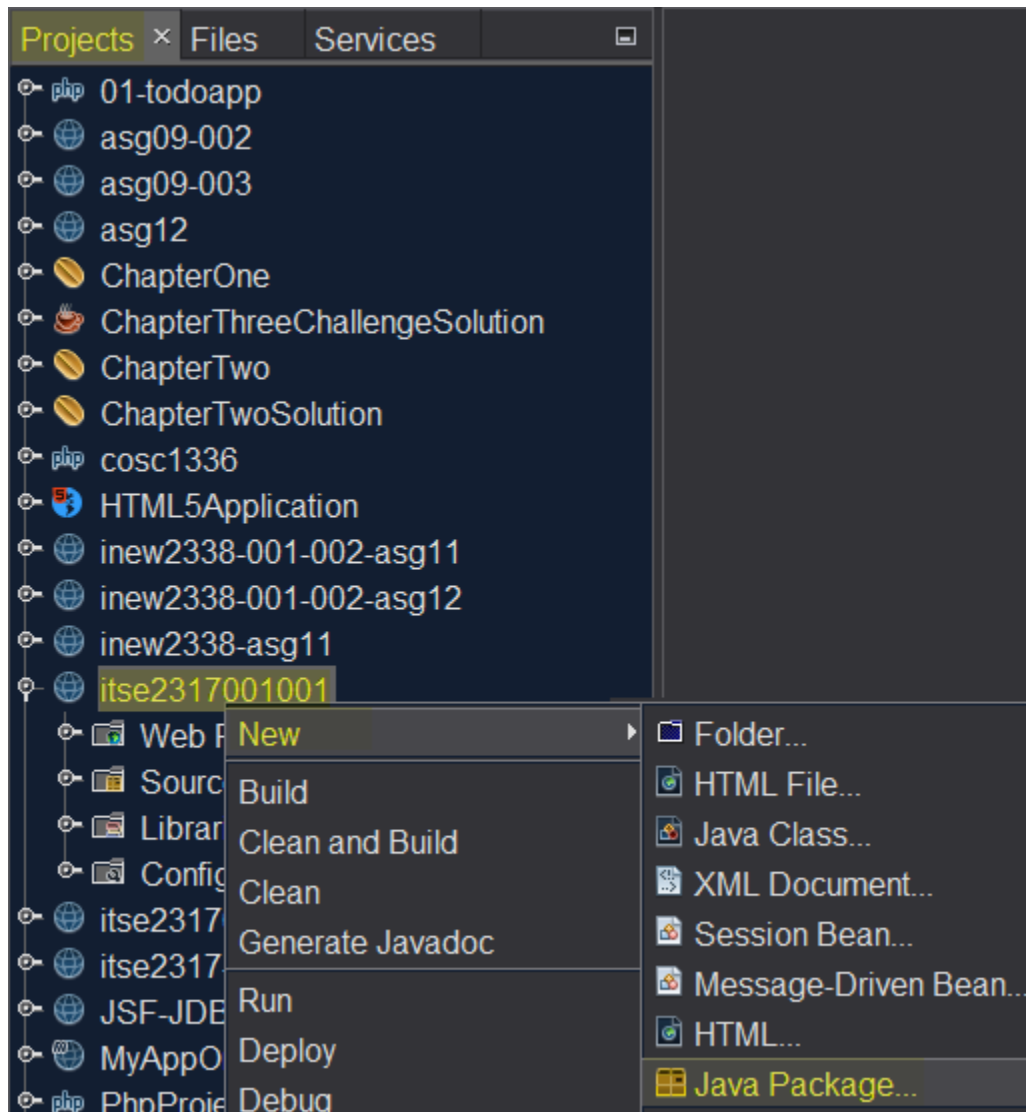


Monitor the progress of WildFly starting in the “Output – WildFly Application Server” window. In my experience, WildFly starts much more quickly than other Java web servers such as Tomcat or Glassfish which are other Java EE servers that ship with NetBeans. Usually it takes less than seven seconds for Wildfly to start. After Wildfly is running, access by <http://localhost:8080/itse2317001001> in the URL address box.

Creating Class Files and Packages in NetBeans

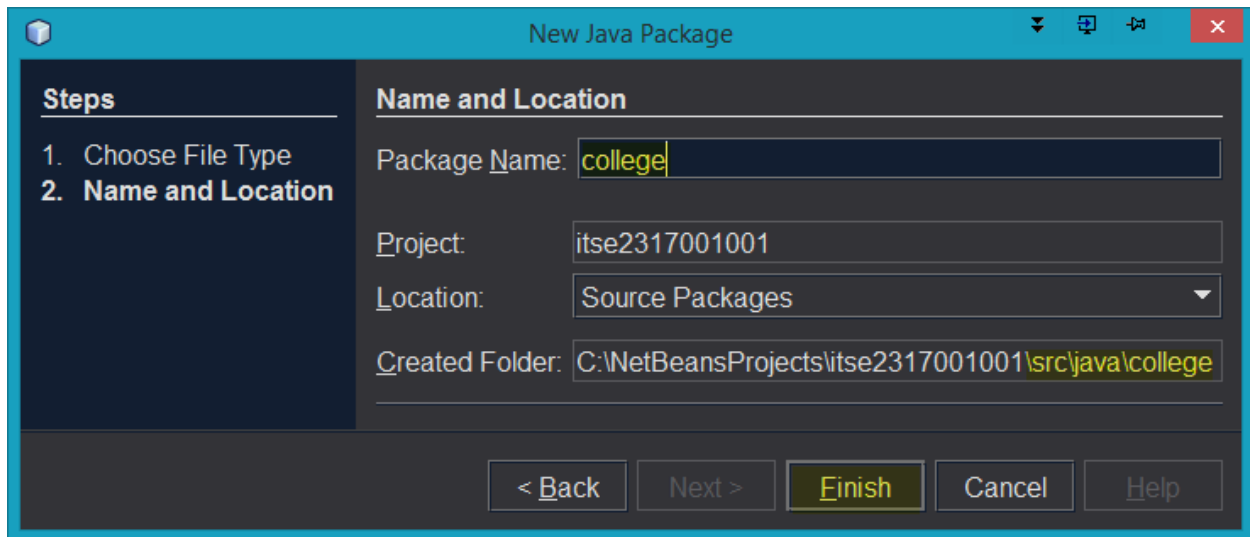
To add files to a project, select the Projects tab, R-click the project name, select New, and then the new file type. If you do not see a selection that you need, select Other... at the bottom of the menu.

JDK-WildFly-NetBeans Setup Local

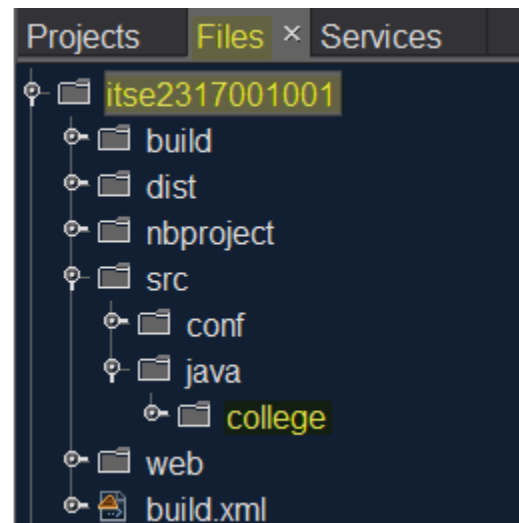
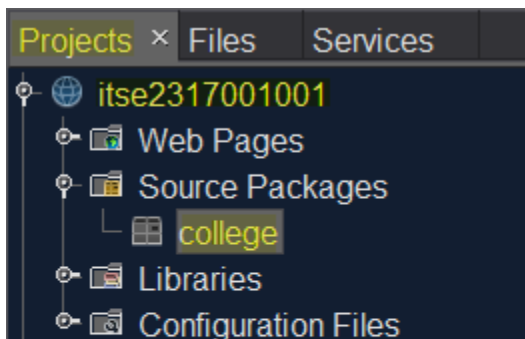


Creating packages: Packages provide a convenient means to organize Java classes and namespaces. NetBeans simplifies the creation and use of packages. To create a package to contain Java class files, R-click on the project name, select New, and then Java Package... The dialog box below appears. We will use the name college. Notice that NetBeans places the package in the standard location of `src\java\{packagename}`.

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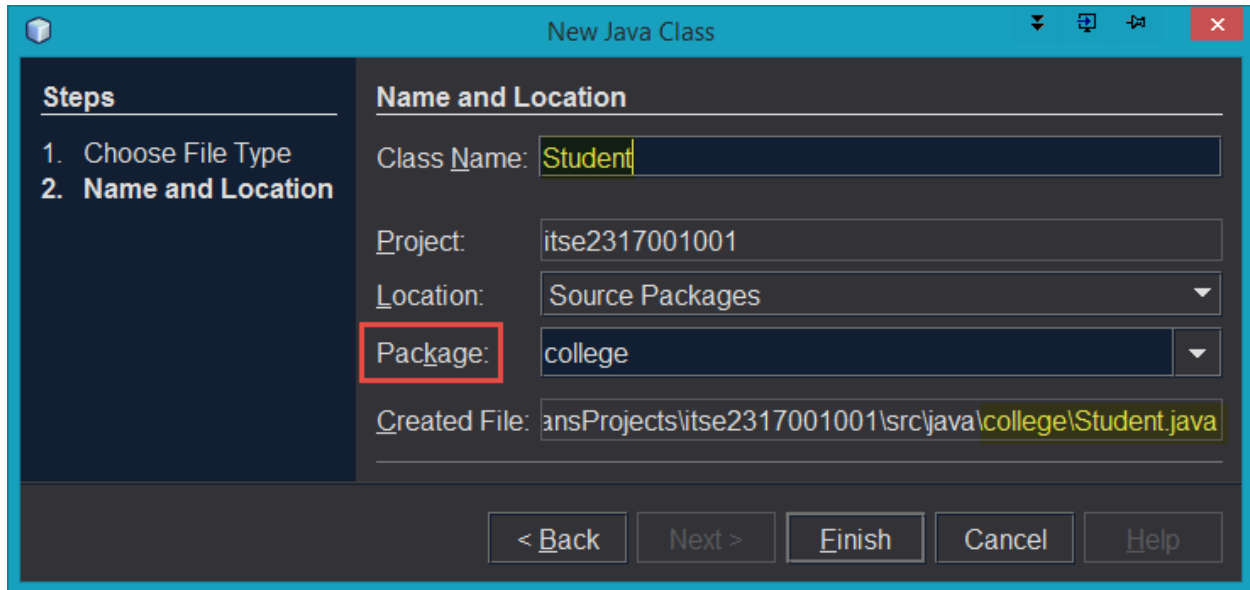
The package is created in the location shown in the different views. Recall that the Projects group on the left shows a *logical configuration* of the project while the Files tab displays the actual file and folder structure, the *physical configuration*.



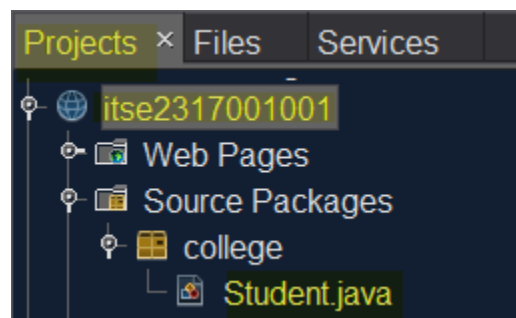
Note: instead of creating a package first and then adding class files to the package, you can create a package at the same time as a class file by selecting Java class... from the New menu.

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After the package is created, you can add a Java class file to the package by Right-clicking the package name and selecting Java class... The class file is named Student in the example, placed in the college package, and in the path shown.



The college package now contains the Student.java class file. By the way, the globe icon identifies itse2317001001 as a web project.



WildFly creates the following starter file Student.java from the .java template.

JDK-WildFly-NetBeans Setup Local

```
Student.java x
1  /*
2   * To change this license header, choose
3   * License Headers in Project Properties.
4   * To change this template file, choose Tools |
5   * Templates and open the template in the editor.
6   */
7  package college;
8
9  /**
10   *
11   *
12   */
13  public class Student {
14
15  }
```

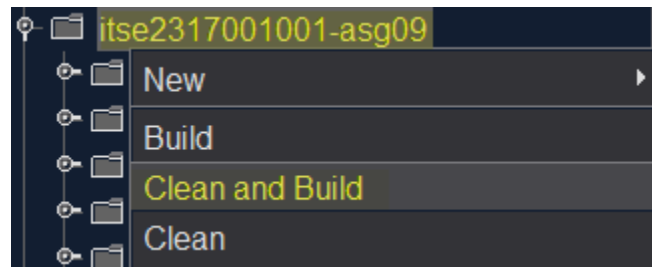
An import statement like that below is used to import this package and its class files for use in a .jsp. You will add a line like that to import classes that you construct later in the course.

```
<%@ page import="college.Student, data.*, java.io.*, java.util.*" %>
```

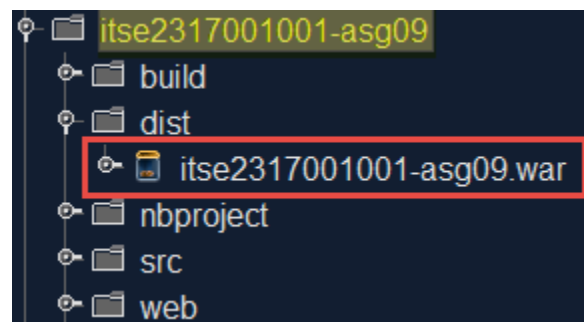
JDK-WildFly-NetBeans Setup Local

Clean and Build to Create the .war File

After testing your projects asg09-asg12 and when ready to upload each project to your student website, R-click the project and select Clean and Build.



With a successful Clean and Build, NetBeans automatically creates the dist (short for distribution) folder and places the itse2317001001-asg09.war file in the dist folder.



The itse2317001001-asg09.war file contains all files, in their proper locations, required for a servlet container to run the website. It is this file that should be uploaded to the student website per the instructions in the “WildFly Setup Remote” tutorial. See Bb for asg09-asg12 assignment instructions.

You are now ready to code your projects asg09-asg12. Good luck with your efforts and enjoy the process. Java EE is challenging but the rewards are worth the commitment.