

@author R.L. Martinez, Ph.D.

### Table of Contents

Overview	1
Security Notice	2
Download and Install Latest Stable JDK	2
Download and Install Latest Stable WildFly	6
Download and Install Latest NetBeans	12
Add WildFly Server to NetBeans	15
Create a Web Application Project in NetBeans	18
Adding the files jboss-web.xml and web.xml	24
Run a Web Application Project in NetBeans	28
Assign the WildFly Server to an Existing NetBeans Project	30
Creating Class Files and Packages in NetBeans	32

### 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.



## 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.

<b>@</b>		Windows Security Alert 🏪 🖭 📼 🦉 🍨	×			
Windows Firewall has blocked some features of this app						
Windows Firewall h	as blocked some	e features of Java(TM) Platform SE binary on all public and				
(	Name:	Java(TM) Platform SE binary				
Ē	Publisher:	Orade Corporation				
	Path:	N:\java\jdk1.8.0_05\bin\java.exe				
Allow Java(TM) Plat	tform SE binary orks, such as m	to communicate on these networks: ny home or work network				
Public networks, such as those in airports and coffee shops (not recommended because these networks often have little or no security)						
What are the risks of allowing an app through a firewall?						
		Pallow access Cancel	]			

# Download and Install Latest Stable JDK

Navigate to the link and download the <u>latest stable</u> 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



Accept the license aggreement (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.							
🔘 Accept License Agreement 💿 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.





Java SE Development Kit 8 Update 102 (64-bit) - Change Folder
Java"
Browse to the new destination folder
Look in:
🛉 jdk1.8.0_102 🗸 🗈
Eolder name:
C:/Java\jdk1.8.0_102\
OK Cancel

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

Java Setup - Destination Folder	- 🗆 🗡		
Destination Folder		Browse For Folder	×
Click "Change" to install Java to a different folder.		Change Destination Folder Java will be installed in the selected folder.	
Install to: C:\Program Files\Java\jre1.8.0_102	Change	a 🕌 Java	^
		▶ ↓ jdk1.8.0_102           ↓ jre1.8.0_102           ▶ ↓ martinez-mysites	
		MSOCache	
		MysQL     NetBeansProjects	
< Back	Next >	NewDirectory	
		🔰 node-files	

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



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

	Java Language		Java Language										
		java	java	с	javado	С	jar	jav	vap	jdeps	Scripting		
	Tools &	Security	Monito	ring	JConso	le ۱	VisualVM	JN	MC		JFR		
	Tool APIs	JPDA	JVM	TI	IDL		RMI	Java	a DB	Dep	loyment		
		Internat	ionalizat	ion	Web	Ser	vices		Trou	iblesho	oting		
	Deployment	J	ava Web	Start	t		A	plet /	/ Java	Plug-in			
						Ja	vaFX						
	<u>User Interface</u> <u>Toolkits</u>	Swi	ng		Java 2D		AWT		4	Accessi	bility		
		Drag an	d Drop	Inp	ut Metho	ds	Image I	0	Print	Service	Sound		_
JUK	Integration Libraries	IDL	JDBC		JNDI	R	VI R	MI-IIC	OP	So	ripting		
		Beans	Se	curity	r	Seria	alization	E	Extens	ion Med	hanism		
	JRE Other Base Libraries	JMX	XML	JAX	Р	Netv	working	C	Overri	ide Mec	hanism		Java SE
		JNI	Date a	and Ti	ime I	Inpu	t/Output		Interr	national	ization	Compact	<u>API</u>
					1	ang	and util					Profiles	
	lang and util	Math	Co	llecti	ons	Re	f Objects		Regu	ular Exp	ressions		
	Base Libraries	Loggin	g Ma	nager	ment	Instr	umentatio	on	Cond	currenc	y Utilities		
		Reflectio	on Ve	ersion	ning l	Prefe	erences A	PI	JA	AR	Zip		
	Java Virtual Machine		Java HotSpot Client and Server VM										

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



### Download and Install Latest Stable WildFly

Download the WildFly .zip file from: <u>http://wildfly.org/downloads/</u> . Be sure to select the latest "Final" verison 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.





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.



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 .

	Edit System Varia	ble	
Variable name:	JAVA_HOME		
Variable value:	c:\Java\jdk1.8.0_10	2	
ystem variables	OK		Cancel
ystem variables Variable	Ok Value		Cancel
ystem variables Variable JAVA_HOME NUMBER OF P	Ok Value c:\Java\jdk1.8.0_102 8		Cancel
ystem variables Variable JAVA_HOME NUMBER_OF_P OS	OK Value c:\Java\jdk1.8.0_102 8 Windows_NT		Cancel
ystem variables Variable JAVA_HOME NUMBER_OF_P OS Path	Ok Value c:\Java\jdk1.8.0_102 8 Windows_NT C:\ProgramData\Orad	: e\Java\ja	Cancel



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 comman window.



Open browser and type <u>http://localhost:8080</u> 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 WildFy "admin" account, I recommend using a username and password of your choosing – username: perhaps your first name password: your choice



- 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.

C8.	C:\WINDOWS\system32\cmd.exe ■	<b>∞</b> - <b>)</b> <	•	-		x
What type of user do you a) Management User (mgmt b) Anplication User (app (a) a	wish to add? -users.properties) lication-users.properties)					^
Enter the details of the Using realm 'ManagementRe Username Password recommendations add-user.properties conf - The password should no n, administrator) - The password should co 1 digit(s), 1 non-alphan - The password should be	new user to add. alm' as discovered from the exist are listed below. To modify these iguration file. t be one of the following restric ntain at least 8 characters, 1 al umeric symbol(s) different from the username	ing pro restri ted val phabeti	perty ctior lues < lc cha	) fi: ns ec (root nract	les. lit = t, a ter(:	the dmi s),
Password : Re-enter Password : What groups do you want t list, or leave blank for About to add user ' Is this correct yes/no? y	his user to helong to? (Please en none)[ ]: for realm 'ManagementRealm'	ter a c	omma	sepa	arati	ed v

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

Authentication Red	quired
The server http://locall password. The server s	nost:9990 requires a username and ays: ManagementRealm.
User Name:	
Password: ****	****
	Log In Cancel

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



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 datasourse within WildFly. To take a glimpse of the process to add a datasoure select Start under Configuration | Create a Datasource.

Wild	ly				
Home	Deployments	Configuration	Runtime	Access Control	Patching
W	ildFly				
्र २ २ २ २ २ २ २ २ २ २ २ २ २ २ २ २ २ २ २	Configuration	settings			
~	Create a Datasource	Start \varTheta			
[ c	Define a datasource to leployed and register	be used by deployed	d applications.	The proper JBDC drive	er must be
1 2 3	l. Select the Datasour 2. Add a Non-XA or XA 3. Use the 'Create Data	ces subsystem datasource asource' wizard to co	nfigure the dat	asource settings	

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.

WildFly	_		
Home Deployments Configu	ration Runtime Access Control	Patching	
Configuration	Subsystem (28)	Туре	Datasource Add
Subsystems	> Q	Non-XA	ExampleDS
Interfaces	JCA	XA	
Socket Binding	Datasources	>	



Before leaving WildFly, it is a good time to add an "<u>Application User</u>" 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.

📾 Command Prompt 🔻 🔁 🚧 🗕 🗖 🗙
Microsoft Windows [Version 6.3.9600]
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 'AnnlicationRealm' 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, admi n, administrator}
- The password should contain at least 8 characters, 1 alphabetic character(s), 1 digit(s), 1 non-alphanumeric symbol(s) Password :
What groups do you want this user to belong to? (Please enter a comma separated list, or leave blank for none)[ ]: itse2317001001 About to add user 'itse2317001001' for realm 'HyplicationRealm'
Added user 'itse2317001001' to file 'C:\wildfly-10.1.0.Final\standalone\configur ation\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 pr ocess? e.g. for a slave host controller connecting to the master or for a Remoting conn ection for server to server FJR calls.
yes/no?no Press any key to continue
C:\wildfly-10.1.0.Final\bin>



## 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: <a href="https://netbeans.org/downloads/">https://netbeans.org/downloads/</a>

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.



NetBeans IDE 8.2 Download							
Supported technologies *	Java SE	Java EE					
NetBeans Platform SDK	•	•					
Java SE	•	•					
🖲 Java FX	•	•					
Java EE		•					
🖲 Java ME							
ITML5/JavaScript		•					
Image:							
③ C/C++							
④ Groovy							
Iava 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).



0	NetBeans IDE Installer	- 🗆 🗙
NetBeans IDE 8.2 Installation Choose the installation folder ar	ıd JDK™.	S NetBeans IDE
Install the NetBeans IDE to: C:\VetBeans 8.2 JDK™ for the NetBeans IDE: C:\Java\jdk1.8.0_102	This should be the default. If no	Browse
	<back< td=""><td>Next &gt; Cancel</td></back<>	Next > Cancel

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.



0	NetBeans IDE Installer	- 🗆 🗙			
Setup Complete Click Finish to finish the NetBeans IDE se	etup.	S NetBeanside			
Installation completed successfully.					
JUnit library successfully installed and all p	lugins are up to date.				
To launch the IDE, use either the Start menu or the NetBeans desktop icon.					
To change installed components and add NetBeans plugins, use Plugin Manager that is an integral part of NetBeans IDE.					
Contribute to the NetBeans project by	y providing anonymous usage data	Finish			

### 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.)



Add WildFly Server to NetBeans...



Select Wildfly Application Server.



0	Add Server Instance	÷	Ð	-( <b>3</b>	×
Steps	Choose Server				
1. Choose Server 2	Server: Apache Tomcat or TomEE GlassFish Server JBoss Application Server Oracle WebLogic Server WildFly Application Server				
	Name: WildFly Application Server				
	< <u>B</u> ack Next > Einish Ca	Incel		<u>H</u> el	D

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

0	Add Server Instance	Ð -¤ ×
Steps1. Choose Server2. Server Location3. Instance Properties	Server Location:       C:\wildfly-10.1.0.Final         Server Configuration:       configuration\standalone.xml	Br <u>o</u> wse Br <u>o</u> wse
	< <u>B</u> ack Next > <u>F</u> inish Cancel	Help

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.



0	Add Serve	r Instance 🛛 🕈 🔁 🎋 🗙			
Steps	Instance Properties				
<ol> <li>Choose Server</li> <li>Server Location</li> <li>Instance Properties</li> </ol>	Select Server Conf	iguration			
	<u>D</u> omain:	standalone			
	Domain Path:	C:\wildfly-10.1.0.Final\standalone			
	<u>H</u> ost:	localhost			
	<u>P</u> ort:	8080			
	Management Port:	9990			
	< <u>B</u> ack	Next > <u>Finish</u> Cancel <u>H</u> elp			

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.

Out	put - WildFly A	pplication Sei	rver	×
	2016-10-17	15:31:54,282	INFO	[org.jboss.as.connector.s
	2016-10-17	15:31:54,297	INFO	[org.jboss.as.jsf] (Serve
••	2016-10-17	15:31:54,297	INFO	[org.jboss.as.webservice:
	2016-10-17	15:31:54,297	INFO	[org.wildfly.extension.id
~	2016-10-17	15:31:54,297	INFO	[org.jboss.as.security]
	2016-10-17	15:31:54,297	INFO	[org.jboss.as.naming] (M
2	2016-10-17	15:31:54,313	INFO	[org.jboss.as.security]
~	2016-10-17	15:31:54,313	INFO	[org.jboss.as.connector]

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.





# 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)

<u>F</u> ile <u>E</u> dit <u>V</u> iew	<u>N</u> avigate	<u>S</u> ource	Ref <u>a</u> ctor
🗄 🛅 🔛 🖣	ł 9	୯	
Projects × Files	Servic	es	

In the next dialog box make the following selections.



0	New Project 🗢 🗘 🖓 💌
Steps	Choose Project
1. Choose Project	۹ Filter:
£	<u>C</u> ategories: <u>P</u> rojects:
	🚽 🗇 🗰 🖕 🖉 🖉 🖉 🖉 🖉
	Java EE 🛛 🔮 Web Application with Existing Sour
	Time-Form Application
	Groovy
	Description:
	Creates an empty Web application in a standard IDE project. A standard project uses an IDE-generated build script to build, run, and debug your project
	< <u>Back</u> Next > Einish Cancel Help

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.



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



0		New Web Application	× 🕹 🖗 🗲
Steps	Name and Locat	ion	
1. Choose Project	Project <u>N</u> ame:	itse2317001001	]
2. Name and Location       3. Server and Settings       4. Frameworks       Project Location	Project Location:	C:\NetBeansProjects	B <u>r</u> owse
	Project <u>F</u> older:	C:\NetBeansProjects\itse2317001001	]
		< <u>B</u> ack Next > Einish Cance	l <u>H</u> elp

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.

0		New Web Application	₹ Ę	-¦⊐	×
Steps	Server and Settin	igs			
<ol> <li>Choose Project</li> <li>Name and Location</li> </ol>	Add to Enterprise	Application: <pre></pre>			•
3. Server and	<u>S</u> erver:	WildFly Application Server	•	A <u>d</u> d.	
4. Frameworks	<u>J</u> ava EE Version:	Java EE 7 Web 👻			
	Context <u>P</u> ath:	/itse2317001001			
		< <u>B</u> ack <u>Next</u> > <u>F</u> inish Cano	cel	<u>H</u> elp	

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



0	New Web Application	Ŧ	Ð	×
Steps <ol> <li>Choose Project</li> <li>Name and Location</li> <li>Server and Settings</li> <li>Frameworks</li> </ol>	Frameworks Select the frameworks you want to use in your web application Spring Web MVC JavaServer Faces			
	< <u>B</u> ack Next > <u>Finish</u> Car	ncel		<u>H</u> elp

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



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.



Ð	index.jsp ×
1	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	<pre>&gt; <html></html></pre>
6	A chead>
7	<pre>title&gt;</pre>
8	ITSE 2317 - Your Name Here - Home Page
9	-
10	-
11	Sody>
12	<hr/>
13	<h1>ITSE 2317 Intermediate Java - Your Name Here</h1>
14	<pre><a href="asg09">Assignment 09</a>  </pre>
15	<pre><a href="asg10">Assignment 10</a>   </pre>
16	<pre><a href="asg11">Assignment 11</a>  </pre>
17	<pre><a href="asg12">Assignment 12</a>  </pre>
18	
19	<pre>Date date = new Date();</pre>
20	<pre>out.print( "<h2 align='\"center\"'>" +date.toString()+"</h2>");</pre>
21	- *>
22	<hr/>
23	-
24	<pre>/html&gt;</pre>

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.





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





# 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 follwing. 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.



0	Ν	ew XML Document	Ŧ	Ð	-tai	×
Steps	Name and L	ocation				
1. Choose File Type 2. Name and Location	File <u>N</u> ame: <mark>jt</mark>	ooss-web				
<ol> <li>Select Document Type</li> </ol>	<u>P</u> roject:	itse2317001001				
4	Fo <u>l</u> der:	web\WEB-INF		Br	o <u>w</u> se.	
	Created File:	nsProjects\itse2317001001\web\WEB-II	NF\ji	boss	-web.	xml
	<	Back Next > Einish Can	cel		<u>H</u> elp	

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.



<b>6</b> 3	jboss-web.xml ×
1	xml version="1.0" encoding="UTF-8"?
2	<pre>&gt; <jboss-web <="" pre="" version="10.0" xmlns="http://www.jboss.com/xml/ns/javaee"></jboss-web></pre>
3	<pre>xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"</pre>
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	<pre><security-domain>java:/jaas/other</security-domain></pre>
8	<pre>_ </pre>

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.



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



# 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.

Output - WildFly	Application Server ×	
	Run Button	

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.





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 <u>http://localhost:9990</u>. That will open the WildFly Web Admin tool like shown previously in this tutorial. Remove the deployment as shown.

WildF	ly	_		
Home	Deployments	Configuratior	n Runtime	Access Cor
Deploym	ent	Add		
			itse23170	01001.war
Depioy	inclic is chabled		Deployment	t is enabled
itse2317	001001.war	View -	Details	
		Disable	ed at	2016-10-20 09:5
		Replace	ymer	it was never disa itse2317001001
		Remove		

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

If you are presented with a login screen at this point, use the "<u>Application User</u>" credentials created above with your username and password.



📷 ITSE 2317 - Dr	Martinez 🗙 🧠 WildFly Management 🗙 📃
$\leftrightarrow$ C $\triangle$	(i) localhost:8080/itse2317001001/

# 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).



0	Resolve Missing Server Probiem 📟 🕛 🔹 🗙					
<u> </u>	The target server has not been set or has been removed.					
	Available Java EE 7 Web compatible servers:					
	WildFly Application Server					
	Add Server					
	OK Cancel					

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".



<b>@</b>		Windows Security Alert 🏪 📟 🦉 🔹 🗙				
Windows Firewall has blocked some features of this app						
Windows Firewall h	as blocked some	e features of Java(TM) Platform SE binary on all public and				
(	Name:	Java(TM) Platform SE binary				
Ē	Publisher:	Oracle Corporation				
	Path:	N:\java\jdk1.8.0_05\bin\java.exe				
Allow Java(TM) Plai	tform SE binary orks, such as m	to communicate on these networks: iy home or work network				
Public networks, such as those in airports and coffee shops (not recommended because these networks often have little or no security)						
What are the risks of allowing an app through a firewall?						
		Reference Cancel				

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 severs that ship with NetBeans. Usually it takes less than seven seconds for Wildfly to start. After Wildfly is running, access by <u>http://localhost:8080/itse2317001001</u> 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 <u>Other</u>... at the bottom of the menu.



Projects × Fil	les Services						
🕈 🕸 01-todoa	စ္ 🛍 01-todoapp						
🗢 🌐 asg09-00	e ⊕ asg09-002						
🗢 🌐 asg09-00	03						
🗣 🌐 asg12							
🕈 📎 Chapter	Dne						
🕈 🥙 Chapter	ThreeChallengeSol	ution					
🕈 📎 Chapter	Īwo						
🕈 📎 Chapter	TwoSolution						
🕈 🕸 cosc133	6						
🕈 🕈 HTML5A	pplication						
🕈 🕘 inew2338	8-001-002-asg11						
🕈 🕘 inew2338	8-001-002-asg12						
🕈 🕘 inew2338	8-asg11						
🕈 💮 itse2317	001001						
🛉 🖻 🖬 Web F	New	•	Folder				
🌼 🖬 Sourc	Build		HTML File				
🕛 🗣 🖬 Librar	Clean and Build		🖻 Java Class				
🕒 🖻 Config	Clean		SML Document				
• 🕮 itse2317	Generate Javado	с	🗟 Session Bean				
• 🖤 itse2317	Dun		Message-Driven Bean				
🕈 👹 JSF-JDE	Donlau		ITML				
🕈 🖤 MyAppO	MyAppO Deploy						
🔍 🕸 PhoProie	Debug		La outra r uchage				

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}.



0	New Java Package 🗧 🗧 🖓 😽 🗙		
Steps	Name and Location		
1. Choose File Type 2. Name and Location	Package <u>N</u> ame:	college	
	<u>P</u> roject:	itse2317001001	
	Location:	Source Packages 🗸	
	<u>C</u> reated Folder:	C:\NetBeansProjects\itse2317001001\src\java\college	
< <u>B</u> ack Next > <u>Finish</u> Cancel <u>H</u> elp			

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.



After the package is created, you can add a Java class file to the package by Rclicking 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.

0		New Java Class 🗧 🔁 🗠 🗙	
Steps	Name and Location		
1. Choose File Type 2. Name and Location	Class <u>N</u> ame:	Student	
	Project:	itse2317001001	
	Location:	Source Packages	
	Pac <u>k</u> age:	college 🗸 🗸	
	Created File:	ansProjects\itse2317001001\src\java\college\Student.java	
	<	Back Next > Einish Cancel Help	

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.





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.*" %>
```



# 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 itse2371001001-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.