WA2308 Continuous Integration with Jenkins Maven and Artifactory

Classroom Setup Guide

Web Age Solutions Inc.

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Part 1 - Minimum Hardware Requirements

- 3 GB RAM minimum, 4 GB recommended
- 15 GB in the hard disk
- Access to internet

Part 2 - Minimum Software Requirements

- One of the following Windows versions of Windows 7 (Professional, Enterprise, or Ultimate)
- Latest web browsers:
 - Chrome
 - o Firefox
- Adobe Acrobat Reader
- Zip extraction utility
- JDK 8 Update 45 *
- Eclipse JEE Kepler SR1*
- Artifactory 3.3.0 OSS *
- Apache Tomcat 6.0.37 *
- Jenkins 2.150.3*
- GIT 2.8.1 *
- Apache Maven 3.3.9 *
- * indicates software provided as part of the courseware.

Part 3 - Software Provided

List of ZIP files required for this course and used in next steps on this document:

WA2308_REL_4_0.ZIP

Send an email to **support@webagesolutions.com** in order to obtain a copy of the software for this course if you haven't receive it yet.

All other software listed under Minimum Software Requirements is either commercially licensed software that you must provide or software that is freely available off the Internet.

Part 4 - Instructions

__1. Login with an administrator account. NOTE. THIS COURSE REQUIRES ADMIN PRIVILEGES TO THE STUDENT ACCOUNT.

____2. Makes sure the computer has internet access from the browser and the command line. If needed open the proxy.

- ___3. Extract **ZIP** file directly to C:\
- 4. Review that the following folders were created:
 - C:\LabFiles
 - C:\Software\apache-maven-3.3.9
 - C:\Software\apache-tomcat-6.0.37
 - C:\Software\artifactory-3.3.0
 - C:\Software\eclipse
 - C:\Software\jenkins-2.150.3-Windows

_5. Review that the following files were created:

- C:\Software\Git-2.8.1-32-bit.exe
- C:\Software\jdk-8u45-windows-i586.exe
- 6. Install Mozilla and Chrome.

____7. Make sure C:\LabFiles and C:\Software folders are not ready only.

Part 5 - Privileges to Users

During the labs students will require privileges on several directories. They will need to be able to write, read, and modify files in these directories for the labs. Although the directions below are provided as an example, this may differ depending on Windows version. The important thing is to make sure students have full permissions on the folders below or they may not be able to accomplish some labs.

- C:\Software
- C:\LabFiles
- C:\Workspace

___1. Create the user that the students will use during the class.

____2. Give the student user account administrative rights. During the labs the student requires this to install software.

___3. Open Windows Explorer.

___4. Right click C:\Software and select Properties.

- ___5. Click the **Security** tab.
- ___6. Click Advanced.

Software Properties		
eneral Sharing Security	Previous Versions	s Customize
Object name: C:\Softwar	e	
Group or user names:		
& Authenticated Users		
& SYSTEM		
& Administrators (WA240	6\Administrators)	
& Users (WA2406\Users)	
To change permissions, clic	k Edit.	Edit
		Edit
Permissions for Authenticate		
Permissions for Authenticate	ed	
Permissions for Authenticate Users	ed	
Permissions for Authenticate Users Full control	ed	
Permissions for Authenticate Users Full control Modify	ed	
Permissions for Authenticate Users Full control Modify Read & execute	ed	
Modify Read & execute List folder contents	ed	
Permissions for Authenticate Users Full control Modify Read & execute List folder contents Read	ed Allor	

___7. Click Change Permissions.

w SYSTEM Full control C:\ This folder, subfolder, su	folder, subfolders and
w SYSTEM Full control C:\ This folder, subfolder, su	
w Users (WA2406\Users) Read & execute C:\ This folder, subfolder	
	folder, subfolders and
Model of the second of the sec	folder, subfolders and

___8. Select the Authenticated Users entry and click Edit...

Note. If you don't have a domain in your environment the select **Users** instead Authenticated Users.

🔒 Advanced	Security Settings for Softwa	are		X
Permissions				
To view or Object nam	edit details for a permission en ne: C:\Software	try, select the entry ar	nd then click Edit.	
Permission	entries:			
Туре	Name	Permission	Inherited From	Apply To
	Users (WA2445\Users) Administrators (WA2445 SYSTEM Users (WA2445\Users) Authenticated Users Edit		<not inherited=""> C:\ C:\ C:\ C:\</not>	This folder, subfolders a This folder, subfolders a This folder, subfolders a This folder, subfolders a This folder, subfolders a
Managing	permission entries			
			ОК	Cancel Apply

__9. Check the Allow checkbox to the right of Full Control and click OK.

Permissions:	Allow	Deny
Full control		· ·
Traverse folder / execute file	1	
List folder / read data	1	=
Read attributes	1	
Read extended attributes	1	
Create files / write data	1	
Create folders / append data	V	
Write attributes	V	
Apply these permissions to objects containers within this container on		Clear All
	ОК	Cancel

__10. Select the checkbox for **Replace all child permissions with inheritable permissions from this objects** and then click **OK**.

Add	Edit	Remove
-----	------	--------

📝 Include inheritable permissions from this object's parent

📝 Replace all child object permissions with inheritable permissions from this object

11. A Windows Security dialog will open. Click Yes.

___12. Wait until Windows finishes updating security.

___13. Back in the *Advanced Security Settings* dialog, click **OK**.

____14. Back in the *Properties* dialog, click **OK**.

_____15. Do the same steps to the C:\LabFiles folder.

____16. Create a folder called C:\Workspace if its not already created.

____17. Do the same steps to the C:\Workspace folder.

Part 6 - Installing JDK 8 Update 45

__1. Make sure there is no previous Java version already installed on the system. You can check this by using the Windows "Add/Remove Programs" utility. For the best compatibility with the labs it is suggested that all previous versions of Java be uninstalled before proceeding with these instructions. If this is an issue, please contact the setup support person for the course.

____2. From the C:\Software directory run the following file:

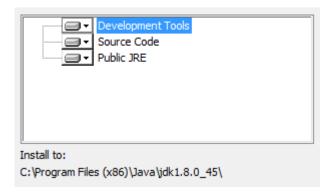
jdk-8u45-windows-i586.exe

Note: If using prompted by a security prompt allow the installation to continue.

____3. When the initial step of the setup appears, press the **Next** button.



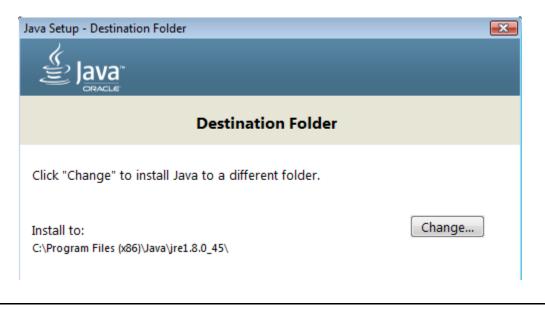
___4. Leave the defaults for installation location and options, and press the Next button.



Note: The installation directory may be slightly different.

The installation will begin installing files.

___5. The Destination Folder will appear, leave the default folder and click Next.



Note: The installation directory may be slightly different.

Wait until the software is completely installed.

___6. Click Close.

Java SE Development Kit 8 Update 45 Successfully Installed
Click Next Steps to access tutorials, API documentation, developer guides, release notes and more to help you get started with the JDK.
Next Steps
Close

___7. Close any browser that appears asking to register the JDK software.

Set the Environment variables.

1. Open a Command Prompt. You can do this with 'Start \rightarrow Programs \rightarrow Accessories \rightarrow Command Prompt'.

____2. Use the 'cd' command to attempt to switch to the following directory. This will verify the presence of a directory used later so make sure you do not get any errors about not being able to "find the path specified".

cd C:\Progra~2\Java\jdk1.8.0_45

C:\Users\AdminUser>cd C:\Progra^{~2}\Java\jdk1.8.0_45

C:\PROGRA~2\Java\jdk1.8.0_45>_

Note: The installation directory may be slightly different depending your operating system. You may need to use the following directory instead of the one listed above:

C:\Progra~1\Java\jdk1.8.0_45

Some of the remaining steps will use the slightly different directory.

___3. Make sure you can reach the java folder and remember the value entered because you will use this value in the following steps.

4. Close the command prompt window.

____5. In the Windows Start Menu, right-click on the **Computer** link in the right-hand side of the Start panel, and then select **Properties**.

____6. Click on Advanced system settings.

Tevice Manager	Windows e
🚱 Remote settings	Windo
🚱 System protection	Copyri
🛞 Advanced system settings	Service

____7. The system will display the **System Properties** dialog. Select the **Advanced** tab and click **Environment Variables**.

Settings
Environment Variables
OK Cancel Apply

8. Under the System Variables list, click the New button.

__9. Enter JAVA_HOME as Variable name.

10. As Variable value enter the following. This should be the value you verified in the *Set the Environment variables section - step 2*.

C:\Progra~2\Java\jdk1.8.0_45

New System Variable	•
Variable name:	JAVA_HOME
Variable value:	C:\Progra~2\Java\jdk1.8.0_45
	OK Cancel

Note: If you are using a 32-bit OS you may have to use C:\Progra~1\Java\jdk1.8.0_45

____11. Click **OK** to create the variable.

__12. From the System Variables list, select Path and click Edit.

__13. At the beginning of the line enter the following. Make sure to include the semicolon on the end:

%JAVA_HOME%\bin;

	······································
Edit System Variable	
Variable name:	Path
Variable value:	%JAVA_HOME%\bin;C:\ProgramData\Orac
	OK Cancel

____14. Click **OK**.

15. Click **OK** to close the *Environment Variables* window.

___16. Click **OK** to close the *System Properties* window.

Part 7 - Verification of JDK 8 Update 45

__1. Open a Windows command prompt. You can do this by selecting '**Start -> Run**', entering '**cmd**', and then pressing the **OK** button. Make sure it is a new command prompt and not one open previously.

2. Enter the following command:

echo %PATH%

Make sure you see the Java 'bin' directory listed at the beginning.

Note: You may see C:\Progra~1\Java\jdk1.8.0_45 or C:\Progra~2\Java\jdk1.8.0_45

3. Enter the following command:

java -version

Make sure you see the response shown below.

```
C:\Users\AdminUser>java -version
java version "1.8.0_45"
Java<TM> SE Runtime Environment (build 1.8.0_45-b15)
Java HotSpot(TM) Client VM (build 25.45-b02, mixed mode)
C:\Users\AdminUser>_
```

Troubleshooting: If you get an error message means that your Environment variable was incorrectly entered, go back and fix the values.

___4. Enter the following command:

javac

Verify that you get the options to run the Java compiler:

```
C:\Users\AdminUser>javac
Usage: javac <options> <source files>
where possible options include:
-g Generate all debugging info
-g:none Generate no debugging info
-g:{lines,vars,source> Generate only some debugging info
```

5. Enter the following command:

```
java -XshowSettings:all 2>&1 | findstr /c:"sun.arch.data.model"
```

```
C:\Users\wasadmin>java -XshowSettings:all 2>&1 | findstr /c:"sun.arch.data.model
"
sun.arch.data.model = 32
```

Verify that it displays the correct value of 32. This indicates that it is 32-bit java that is installed.

Troubleshooting: If it displays 64 for the value, then you have 64 bit java installed and this will cause issues. Please uninstall the 64-bit java and reinstall the indicated 32-bit jdk.

6. Close the command prompt window and any extra windows that are open.

Java has been installed.

Part 8 - Jenkins 2.150.3 Installation

___1. Open a command prompt window and ensure that the Java JDK is installed.

java -version

____2. If you are using a computer where possibly Jenkins was used before then delete the following folders in case they exist:

```
C:\Program Files\Jenkins
C:\Program Files(x86)\Jenkins
C:\Users\<username>\.m2
C:\Users\<username>\.docker
```

3. In Windows Explorer, navigate to C:\Software\jenkins-2.150.3-Windows

_4. Double-click on 'jenkins.msi'. The installer will show the initial dialog.

5. Click Next.

____6. On the **Destination Folder** panel, leave the defaults and click **Next**.

- 7. On the Ready to Install... panel, click Install.
- 8. Windows may show a security dialog. If it does, click Yes.
- __9. In the final dialog panel, click **Finish**.
- ___10. If you see the Create First Admin User screen then click Jenkins.



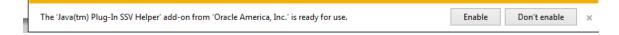
11. If you see the following message, click **Don't show this message again**.

Intranet settings are turned off by default.

Turn on Intranet settings

Don't show this message again

12. If you see the following message, click Enable.



The installer will open a browser window to the Jenkins home page. The page shows the location of a file where you can find the initial administration password, and also a text box to enter the password into.

Unlock Jenkins

To ensure Jenkins is securely set up by the administrator, a password has been written to the log (not sure where to find it?) and this file on the server:

C:\Program Files\Jenkins\secrets\initialAdminPassword

___13. Open the indicated file with an editor such as Notepad, and copy the password to the clipboard with Ctrl-C.

14. Paste the password into the Adminstrator Password box.

C:\Program Files\Jenkins\secrets\initialAdminPassword

Please copy the password from either location and paste it below.

Administrator password

.....

____15. Click Continue.

16. If you are prompted to save the password just close that window.

___17. Click on Install Suggested Plugins.

Customize Jenkins

Plugins extend Jenkins with additional features to support many different needs.

Install suggested plugins	Select plugins to install	
Install plugins the Jenkins community finds most useful.	Select and install plugins most suitable for your needs.	

____18. Getting Started will begin. Wait until is done.

Getting Started

✓ Folders Plugin	✓ OWASP Markup Formatter Plugin	✓ build timeout plugin	 Credentials Binding Plugin 	** Jenкins u ** Jenkins G ** Pipeline:
 Timestamper 	✓ Workspace Cleanup Plugin	🖌 Ant Plugin	🗸 Gradle Plugin	Libraries ** Branch AP ** Pipeline:
✓ Pipeline	 GitHub Organization Folder Plugin 	 Pipeline: Stage View Plugin 	🗸 Git plugin	** Durable T ** Pipeline: Processes ** Pipeline:
ۯ Subversion Plug-in	SSH Slaves plugin	✓ Matrix Authorization	✓ PAM Authentication	** Pipeline:

___19. In the Create First Admin User screen. Enter the following fields:

Username:	wasadmin
Password:	wasadmin
Confirm Password:	wasadmin
Full name:	Administrator
E-mail address:	wasadmin@wasadmin.com

____20. When the input looks like below, click **Save and Continue**.

Create First Admin User

Username:	wasadmin
Password:	•••••
Confirm password:	•••••
Full name:	Administrator
E-mail address:	sadmin@wasadmin.com

21. Instance Configuration page will open, just click Save and Finish.

Instance Configuration Jenkins URL: http://localhost:8080/____ The Jenkins URL is used to provide the root URL for absolute links to various Jenkins resources. That means this value is required for proper operation of many Jenkins features including email notifications, PR status updates, and the BUILD_URL environment variable provided to build steps. The proposed default value shown is not saved yet and is generated from the current request, if possible. The best practice is to set this value to the URL that users are expected to use. This will avoid confusion when sharing or viewing links.

150.3

Not now Save and Finish

22. If you are prompted to save the password just close that window.

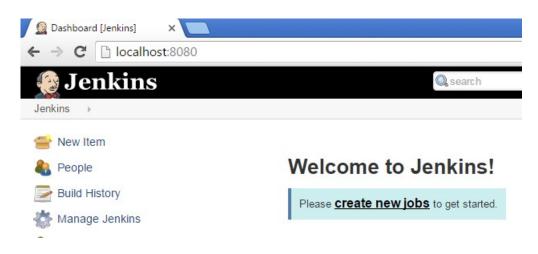
23. You will see that Jenkins is ready. Click **Start using Jenkins**.

Jenkins is ready!

Your Jenkins setup is complete.



_24. Jenkins will open.



- _25. Jenkins installation is complete. Close the browser.
- 26. Close all open windows.

Part 9 - Installing Git-2.8.1-32-bit

IMPORTANT: Setup is easy but you need to make sure you do the change in Step 7.

1. From the C:\Software\ directory run the following file:

Git-2.8.1-32-bit.exe

- ____2. You may need to allow the program to run.
- ____3. Click Next.



4. Click Next.

🚸 Git 2.8.1 Setup	X
Select Destination Location Where should Git be installed?	
Setup will install Git into the following folder.	
To continue, click Next. If you would like to select a different folder, cl	ick Browse.
C:\Program Files\Git	Browse
Ab last 100-2 MD of fines did, encoding and	
At least 190.3 MB of free disk space is required. https://git-for-windows.github.io/	
< Back Next >	Cancel

Note. You folder may be different.

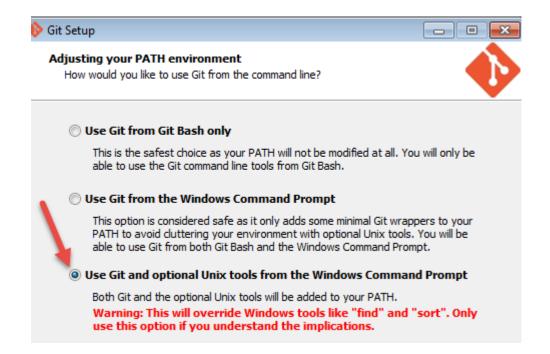
_5. Click Next.

🚸 Git 2.8.1 Setup		
Select Components Which components should be installed?		
Select the components you want to install; clear the components you do not w install. Click Next when you are ready to continue.	ant to	
 Additional icons On the Desktop Windows Explorer integration Git Bash Here Git GUI Here Associate .git* configuration files with the default text editor Associate .sh files to be run with Bash Use a TrueType font in all console windows 		
Current selection requires at least 190.2 MB of disk space. https://git-for-windows.github.io/		
<pre>style for windows/guideney </pre>	Cancel	

___6. Click Next.

🔶 Git Setup	
Select Start Menu Folder Where should Setup place the program's shortcuts?	
Setup will create the program's shortcuts in the following Start Mer	
To continue, click Next. If you would like to select a different folder, click Br	owse.
Don't create a Start Menu folder http://msysgit.googlecode.com/	Cancel
< Back Next >	Cancel

____7. Select Use Git and Optional Unix tools from the Windows Command Prompt.



- 8. Make sure you select the 3rd option as shown above and then click **Next**.
- ___9. Click Next.

🔶 Git Setup	
Configuring the line ending conversions How should Git treat line endings in text files?	D
Ocheckout Windows-style, commit Unix-style line endings	
Git will convert LF to CRLF when checking out text files. When committing text files, CRLF will be converted to LF. For cross-platform projects, this is the recommended setting on Windows ("core.autocrlf" is set to "true").	
🔿 Checkout as-is, commit Unix-style line endings	
Git will not perform any conversion when checking out text files. When committing text files, CRLF will be converted to LF. For cross-platform projects, this is the recommended setting on Unix ("core.autocrlf" is set to "input").	
🔿 Checkout as-is, commit as-is	
Git will not perform any conversions when checking out or committing text files. Choosing this option is not recommended for cross-platform projects ("core.autocrlf" is set to "false").	
http://msysgit.googlecode.com/	
<pre></pre>	:

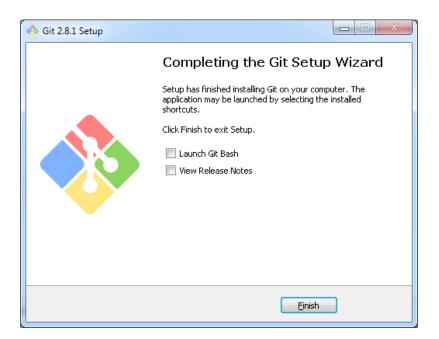
10. Click Next.

🚸 Git 2.8.1 Setup		
Configuring the terminal emulator to use with Git Bash Which terminal emulator do you want to use with your Git Bash?		
Ose MinTTY (the default terminal of MSYS2)		
Git Bash will use MinTTY as terminal emulator, which sports a resizable window, non-rectangular selections and a Unicode font. Windows console programs (such as interactive Python) must be launched via `winpty` to work in MinTTY.		
🔘 Use Windows' default console window		
Git will use the default console window of Windows ("cmd.exe"), which works well with Win32 console programs such as interactive Python or node.js, but has a very limited default scroll-back, needs to be configured to use a Unicode font in order to display non-ASCII characters correctly, and prior to Windows 10 its window was not freely resizable and it only allowed rectangular text selections.		
https://git-for-windows.github.io/		

___11. Leave defaults and click **Install**.

Sit 2.8.1 Setup		
Configuring extra options Which features would you like to enable?	*	
✓ Enable file system caching		
File system data will be read in bulk and cached in memory fo operations ("core.fscache" is set to "true"). This provides a sig performance boost.		
📝 Enable Git Credential Manager		
The <u>Git Credential Manager</u> for Windows provides secure Git credential storage for Windows, most notably multi-factor authentication support for Visual Studio Team Services and GitHub. (requires .NET framework v4.5.1 or or later)		
https://git-for-windows.github.ia/		
< Back Insta	all Cancel	

___12. De-select View Release Notes, and then click Finish.



__13. Close all open files.

You have completed GIT installation.

Part 10 - Summary

You have successfully installed the software for this course!

If you have any question please contact us by email at support@webagesolutions.com

From US and Canada call: 1-877-812-8887 ext. 26

International call: 416-406-3994 ext. 26