

CS580 Advanced Software Engineering Assignment 8 - Continuous Integration

Due Date

Monday, November 24, 2014

Score

5

Questions and Directions

In this assignment, you will be setting up the continuous integration pipeline for your iphoto-web application using Jenkins, so that the version control, testing, build, release and deployment can be fully automated.

To submit the assignment, please notify me by email that your Jenkins job has been configured successfully. Please send me **1) the URL to your Jenkins job**, such as <http://jenkins.yusun.io/jenkins/job/iphoto-web-yusun/>; **2) the DNS name of your server**, such as <http://ec2-54-67-30-104.us-west-1.compute.amazonaws.com:8080/>

I will test your pipeline by pushing a random code change and verify if the change can be deployed automatically in your server.

0. Build Your Project with Maven in Command-Line Mode

You should be able to run `mvn package` in your project folder and have the whole project built correctly. The final deployable artifact for your project should be the `iphoto-web.jar` (or `iphoto-web-yourname.jar`) file in the target directory.

*****Note:** once you add unit tests and integration tests in Assignment 6, you should make sure that your tests can be built and passed with `mvn package`. Particularly, you should be careful about any of the hard-coded test file paths, or the platform-dependent paths (e.g, `C:\Users\...`). These could cause problems later when you try to use Jenkins to build your project.

1. Prerequisite

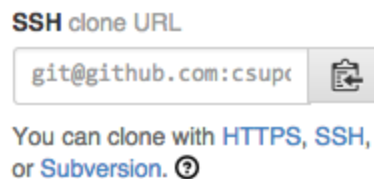
- You should have finished Assignment 7 and have a AWS EC2 server up and running.
- You should know the public DNS name of your server, and know how to login to your server with ssh or Putty.
- You need to have an account in Jenkins <http://jenkins.yusun.io/jenkins/>, and have permissions to access it.

2. Create a new job in Jenkins for your iphoto-web project

Login to Jenkins and choose “New Item”. You will need to create a Maven Project with a unique name (you should name your item with your name or id).

You need to configure our project with the following key options:

1. Choose the “Git” project in “Source Code Management”, and configure the Repository URL for your Git project. The URL can be found in your GitHub project page as shown below. **IMPORTANT: Please choose “SSH” URL, rather than the regular “HTTPS” URL. Your URL should look like “git@github.com:.....”**



2. Choose both “Build whenever a SNAPSHOT dependency is built” and “Build when a change is pushed to GitHub” in “Build Triggers”
3. Configure the “Goals and options” with “package” in “Build”
4. Choose “Run only if build succeeds” in “Post Steps”
5. Save

3. Build the project

Click on “Build Now” in Jenkins, you should be able to see Jenkins starts to build your project.

Please check the result of the build. If it fails, go to the build and check “Console Output”. You need to check what the issue is and fix it.

*****Note: your tests and your code may not be built successfully for various reasons. Please read the error messages carefully and fix those by pushing new code to your project and try to build it again. You should also be aware that the Jenkins is running in Linux with JDK7, so the environment may not be the same as your development environment. You need to figure out how to solve the issue when the building process is failed in Jenkins.**

You cannot move to the following steps unless you have your project built correctly.

4. Automated push and build with GitHub and Jenkins

Go to your GitHub project settings page, and choose “Webhooks & Services”:

Click on “Add webhook”, and fill in the following information:

- Payload URL: <http://jenkins.yusun.io/jenkins/github-webhook/>
- Content type: application/x-www-form-urlencoded
- “Just the push event”
- Finally, “Add webhook”

To verify all of this, please commit and push a minor change (e.g., change your README file) and see if the build can be automatically triggered in Jenkins.

5. Add post-execution shell script

To automate the deployment process, **you need to configure the key in your own EC2 server so that the Jenkins server can have the access to your EC2 server**. In order to do this, you need to first login to the terminal of your EC2 server (see Assignment 7). Then, edit the file at `.ssh/authorized_keys` with the following command (feel free to use other editors):

```
vim ~/.ssh/authorized_keys
```

Then, copy and paste the following public key to the file (add one extra line to paste the whole thing), and save the file:

```
ssh-rsa
AAAAB3NzaC1yc2EAAAADAQABAAQAC3xCLP9eywMfkqpPaJa9rM0VGLeQ1rYGPHxox8YdL1Tk7
rs/gkKT/aU2B1S0gBkxD+r5WZ1UkUNuxIOyCFFoSAwJGTmVuQpGfSH1czB8LEF4KjGJesbS1sf
2d0tBUFTfDpfFyzRxm1v0M38d7TxM9LFpHDddCHPEFweE0LH0i5R2gaHK5db3hGCZh0pQvUPLQ6
Kzpn0w04gnTvhDi+fAmb4uvB/3deay8teq4gcaAn41/kITkYfyTmQk7ziZu4RwBXaLS9Wf6Xqsc
3z4mGv+fJWOMbuf7Hofn84PR1T4T9kzGgV1fp4a4QB0aFC8eIgsI4jAQ/mNCQ9mEGnR4h7K1
yu.sun.cs@gmail.com
```

Now, go back to Jenkins. In your Jenkins job configuration page, you can “Add post-build step”, and then choose “Execute shell”. Copy and paste the following commands, but replace the DNS name (bold) with your own DNS name:

```
scp -o "StrictHostKeyChecking no" ./target/iphoto-web-1.0.jar  
ec2-user@ec2-54-67-13-222.us-west-1.compute.amazonaws.com:~/
```

```
ssh -o "StrictHostKeyChecking no"  
ec2-user@ec2-54-67-13-222.us-west-1.compute.amazonaws.com "killall java" ||  
true
```

```
ssh -o "StrictHostKeyChecking no"  
ec2-user@ec2-54-67-13-222.us-west-1.compute.amazonaws.com 'nohup java -jar  
/home/ec2-user/iphoto-web-1.0.jar >/dev/null 2>&1' &
```

Save your change and trigger a new build, followed by verifying if the build can be succeeded.

Finally, push a new code change to GitHub and see if a successful build + deployment can be done automatically. If so, great job!