Git with EC2 (Windows)

* Description:
  + Practicing code control framework by creating a code control system using Git and EC2 web server, where i create Git repository on server and local machine to connect to each other with remotes and commit the adjusted project and compare 2 different commitment projects to observe how Git analysis the code control informations.
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* Start date: 2017/09/22
* End date: 2017/09/26
* AWS management console:
  + <https://us-west-2.console.aws.amazon.com/ec2/v2/home?region=us-west-2#Instances:instanceId=i-053ac06fa64b9e8fa;sort=launchTime>
* Main tutorial:
  + <http://www.jeffhoefs.com/2012/09/setup-git-deploy-for-aws-ec2-ubuntu-instance/>
* EC2 Linux AMI instance:
  1. Hostname: **ec2-52-10-44-89.us-west-2.compute.amazonaws.com**
  2. Key pair: **wy\_ec2\_key\_pair.pem**
  3. Elastic IP: 52.10.44.89
  4. [Connect with SSH](#_7a1nt2ryq5i):
     + **ssh -i "wy\_ec2\_key\_pair.pem" ec2-user@ec2-52-10-44-89.us-west-2.compute.amazonaws.com**
* Public key:
  1. ~/Users/Nickj/.ssh/id\_rsa
* Private key:
  1. wy\_ec2\_key\_pair.pem
* Extra references:
  1. Show hidden file in WinSCP:
     + <https://www.successfulhosting.com/crm/index.php?_m=knowledgebase&_a=viewarticle&kbarticleid=380>
     + Menu “Options” → Preferences → Panel → Show hidden files.
  2. Vi manual:
     + <https://docs.oracle.com/cd/E19683-01/806-7612/editorvi-9/index.html>
  3. Windows show hidden files:
     + Window search “Show hidden files and folders” → Click the “Show hidden files and folders” icon → Under “Hidden files and folder” → Check “Show hidden files, folders and drivers”

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* Setup EC2 and launch instance:

1. Follow instructions to setup EC2 in AWS:
   1. <http://docs.aws.amazon.com/AWSEC2/latest/UserGuide/EC2_GetStarted.html#ec2-launch-instance>
2. Check if the instance is launched through AWS console:
   1. <https://us-west-2.console.aws.amazon.com/ec2/v2/home?region=us-west-2#Instances>:
3. Created instance:
   1. Hostname: **ec2-52-10-44-89.us-west-2.compute.amazonaws.com**
   2. Key pair: **wy\_ec2\_key\_pair.pem**
   3. Elastic IP: 52.10.44.89
   4. [Connect with SSH](#_7a1nt2ryq5i):
      1. **ssh -i "wy\_ec2\_key\_pair.pem" ec2-user@ec2-52-10-44-89.us-west-2.compute.amazonaws.com**
4. I can ping the EC2 server with proper security group created:
   1. <https://serverfault.com/questions/511738/why-cant-i-ping-my-freshly-set-up-amazon-web-service-ec2-instance>
   2. Go to [Security Groups](https://us-west-2.console.aws.amazon.com/ec2/v2/home?region=us-west-2#SecurityGroups:sort=groupId) → Right click the security group → Edit Inbound rules → Add rule → Select “All ICMP” → Save.

* Installation - GIT, Python, pip:

1. Download GIT:
   1. <https://git-for-windows.github.io/>
2. Install Python (pip) using executable installer:
   1. <https://www.python.org/ftp/python/3.6.2/python-3.6.2.exe>
   2. MUST click “Add Python to environment variables” option to use “python” command directly through command prompt.
3. Check Python and pip is installed correctly:
   1. **python --version**
   2. **pip --version**

* Installation - EC2 Apache web server:
* <http://docs.aws.amazon.com/AmazonRDS/latest/UserGuide/CHAP_Tutorials.WebServerDB.CreateWebServer.html>
* Now i can connect the AMI with browser using elastic IP address:
  + <http://52.10.44.89/>
  + And the .php file created following the instruction from above:
    - <http://52.10.44.89/SamplePage.php>
* Create a index.html to double check.

* Connect EC2 from Windows with PuTTY:

1. Connect to Linux AMI in Windows using PuTTY:
   1. <http://docs.aws.amazon.com/AWSEC2/latest/UserGuide/putty.html>
      1. Convert .pem key pair to .ppk file using PuTTYgen
         1. Load → Browse the .pem file → Click the drop down menu beside file name section to select “.” all files to load .pem file → Ok → Click “Save private key” → (Passphrase is another password) → Save as Type “.ppk” → Save.
      2. Open with PuTTY:
         1. Hostname: [**ec2-user@ec2-52-10-44-89.us-west-2.compute.amazonaws.com**](mailto:ec2-user@ec2-52-10-44-89.us-west-2.compute.amazonaws.com)
         2. Connection → SSH → Auth → Browse the converted .ppk private key file.
      3. New terminal like window will appear which is the Linux console connected to EC2.
2. Optional:
   1. Transfer file through Windows command prompt:
      1. pscp -i C:\Users\Nickj\Desktop\wy\_ec2\_key\_pair.ppk C:\Users\Nickj\Desktop\test.txt [ec2-user@ec2-52-10-44-89.us-west-2.compute.amazonaws.com](mailto:ec2-user@ec2-52-10-44-89.us-west-2.compute.amazonaws.com):/home/ec2-user/test.txt
3. Download WinSCP (GUI like FileZilla):
   1. <https://winscp.net/eng/docs/executables>
   2. Install → Open WinSCP → Login window will automatically open → Enter Hostname: [**ec2-user@ec2-52-10-44-89.us-west-2.compute.amazonaws.com**](mailto:ec2-user@ec2-52-10-44-89.us-west-2.compute.amazonaws.com)→ → Click “Advanced” → Go to “Authentication” → Browse private key .ppk by clicking “...” button→ OK → Connected → EC2 repository is shown at the right

* Connect EC2 from Windows with command line - Cygwin (32bits):

1. Cygwin 32bit install with SSH:
   1. ftp://ftp.perforce.com/perforce/tools/benchmarks/browse/doc/cygwin.html
2. After installing Cygwin with SSH from above link i can now use the Cygwin terminal to log in to EC2 by SSH after navigating to the directory where .pem key is:
   1. Command:
      1. Chmod 600 wy\_ec2\_key\_pair.pem
      2. ssh -i wy\_ec2\_key\_pair.pem [ec2-user@ec2-54-203-9-161.us-west-2.compute.amazonaws.com](mailto:ec2-user@ec2-54-203-9-161.us-west-2.compute.amazonaws.com)
3. And now i can also log in from the Windows terminal using commands above.

## EC2 server Git repository setup:

* 1. Copy my local machine SSH public key to EC2 instance SSH authentication keys:
     1. $ cat ~/.ssh/id\_rsa.pub | ssh -i wy\_ec2\_key\_pair.pem ec2-user@ec2-52-10-44-89.us-west-2.compute.amazonaws.com "cat >> .ssh/authorized\_keys"
  2. Log into EC2:
     1. $ ssh -i wy\_ec2\_key\_pair.pem ec2-user@ec2-52-10-44-89.us-west-2.compute.amazonaws.com
  3. Create a repository in EC2 home folder:
     1. $ cd ~  
        $ mkdir ProjectDir.git && cd ProjectDir.git  
        $ git init --bare
  4. Create a post-receive hook which connects to EC2 Apache web server:
     1. $ cat > hooks/post-receive

#!/bin/sh

GIT\_WORK\_TREE=/var/www/html/index.html

export GIT\_WORK\_TREE  
git checkout -f

* + 1. Make the post-receive file executable:
       1. $ chmod +x hooks/post-receive

## EC2 client Windows local Git repository setup:

* 1. Create a new directory “ProjectDir”
     1. $ mkdir ProjectDir
  2. Navigate to the project folder → Right click on the file explorer → Open “Git Bash Here”.
  3. Initialize Git:
     1. $ git init
  4. Add all files in local machine repository to commit:
     1. $ git add .
  5. Commit:
     1. $ git commit -m "first commit"
  6. If “\*\*\* Please tell me who you are.” error appears then do this:
     1. $ git config user.name "someone"
     2. $ git config user.email "someone@someplace.com"

$ git config user.name "someone"

$ git config user.email "someone@someplace.com"

* + 1. And do the commit again
       1. $ git commit -m "first commit”
  1. Add a remote to the EC2 Git --bare folder (Remote named “ec2” in this ex.):
     1. $ git remote add ec2 ssh://ec2-user@ec2-52-10-44-89.us-west-2.compute.amazonaws.com/home/ec2-user/ProjectDir.git
     2. (I can use “git set-url ec2 ssh:// ...” to update the remote URL)
     3. (I can use “[git remote -v](https://stackoverflow.com/questions/32238616/git-push-fatal-origin-does-not-appear-to-be-a-git-repository-fatal-could-n)” to check the remote lists)
  2. Next push the references using git push. You only have to do this for the first time (**Caution: In order to push i need to commit successfully first**):
     1. $ git push ec2 +master:refs/heads/master
  3. Now every time you push to your bitbucket or github remote repo. You can also push the changes to the server:
     1. $ git push ec2 master
  4. If this output is printed then all setup is done:

Counting objects: 4, done.

Delta compression using up to 4 threads.

Compressing objects: 100% (3/3), done.

Writing objects: 100% (4/4), 1.53 KiB | 1.53 MiB/s, done.

Total 4 (delta 0), reused 0 (delta 0)

To ssh://ec2-52-10-44-89.us-west-2.compute.amazonaws.com/home/ec2-user/ProjectDir.git

\* [new branch] master -> master

* 1. Optional:
     1. If you want to do it in one command, you can edit the config file of your project (still on your development machine) and add the urls in there:
        1. [remote "all"]  
            url = https://github.com/YourGitAccount/ProjectDir.git  
            url = websitebroker:/home/ubuntu/website.git
     2. Now all you have to do is push using the all alias:
        1. git push all master
  2. Then i can start developing on the project and commit to Git.

* 1. Finally, i can download the Git project from EC2 using following command where /home/ec2-user/ProjectDir.git will be download to current terminal path:
     1. $ git clone ssh://ec2-user@ec2-52-10-44-89.us-west-2.compute.amazonaws.com/home/ec2-user/ProjectDir.git

* 1. And i can review the commit info logs using following command:
     1. $ git log -2
        1. Output:

Nickj@DESKTOP-UT1HCRH MINGW64 ~/Desktop/repo (master)

$ git log -20

commit e46c126552d7e21b504c78453f8764d70f3f5d07 (HEAD -> master)

Author: someone <someone@someplace.com>

Date: Mon Sep 25 17:08:18 2017 -0700

Changed test.txt

commit 44b4a4eb2c0a5c38f6ceb39ac30afb7e1a8cb2a6 (ec2/master)

Author: someone <someone@someplace.com>

Date: Sun Sep 24 23:53:49 2017 -0700

first commit

* + 1. This is a useful command because this command can help me find the differences on 2 commitment without any working tree:
       1. Can see from the “git log -2” output, there is a “commit” section with codes:
          1. Eg.

E46c126552d7e21b504c78453f8764d70f3f5d07

44b4a4eb2c0a5c38f6ceb39ac30afb7e1a8cb2a6

* + - 1. I can use these codes to compare the differences between these 2 commitments using following command:
         1. $ git diff e46c126552d7e21b504c78453f8764d70f3f5d07 44b4a4eb2c0a5c38f6ceb39ac30afb7e1a8cb2a6