Infrastructure as Code: Terraform Labs

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Overview

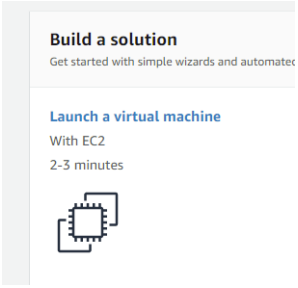
The purpose of these labs is to compare and contrast the processes of starting and stopping an EC2 instance. First, we do it manually. Then with the help of Terraform, we do it again. It should be clear by the end that scripting instances is preferable to manually managing them.

This illustrates the powerful concept of Infrastructure as Code (IaC). By keeping your configurations in code, you have the ability to quickly create, save, and improve your infrastructure.

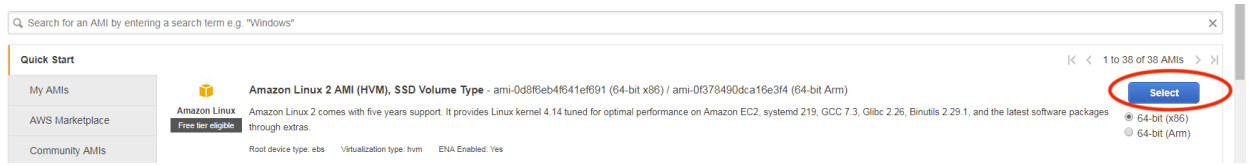
Lab1: Starting and stopping an instance manually

Objective: Deploy an Amazon Linux instance manually. This demonstrates the process is reliable, but rather tedious and not scalable.

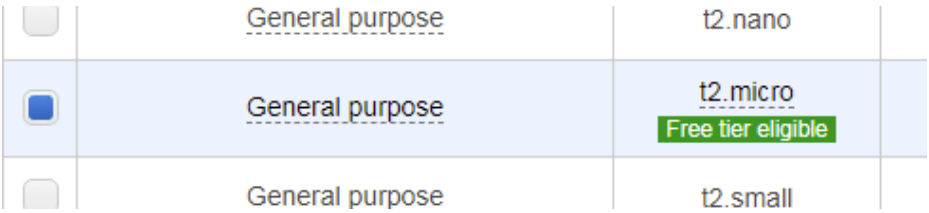
1. Open a Chrome browser window in the WorkSpace
2. Go to “rtt-training.awsapps.com/console”
3. Login with the same userid/password combination used to login to the WorkSpace
4. In the “AWS Management Console” window, click on “Launch a virtual machine”



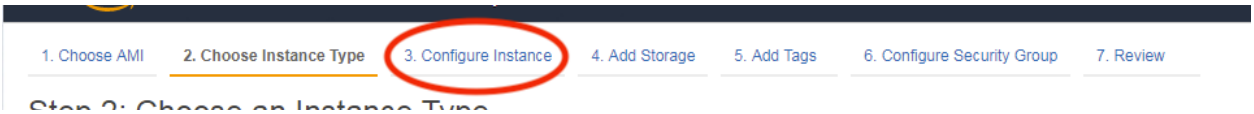
5. Select the “Amazon Linux 2” type from the top of the list



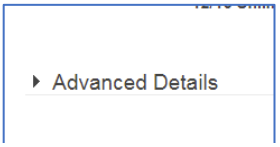
6. Select “t2.micro”



7. Click on “Configure Instance” link at the top of the page



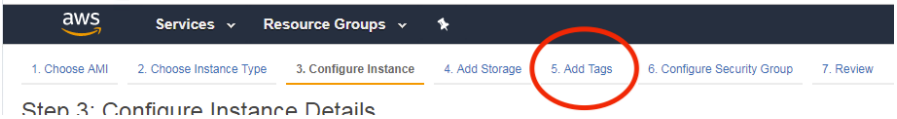
8. Click on “Advanced Details” in the middle of the page



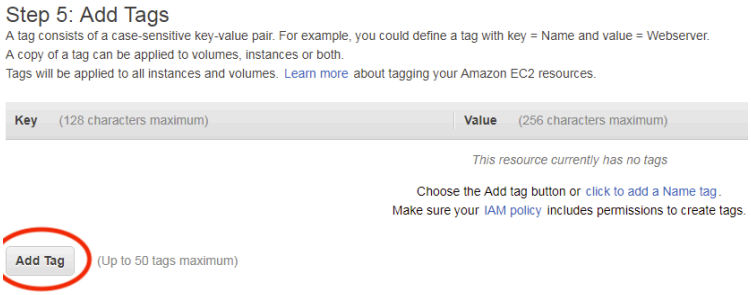
9. Paste the following into the “user data” field.

```
#!/bin/bash -xe
yum clean all
yum -y update
yum -y install httpd
apachectl start
echo "<h1>TrainingX: Deployed via Terraform</h1>" | sudo tee /var/www/html/index.html
```

10. Click on the “Add Tags” link at the top of the page

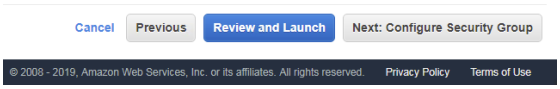


11. Click on the “Add Tag” button

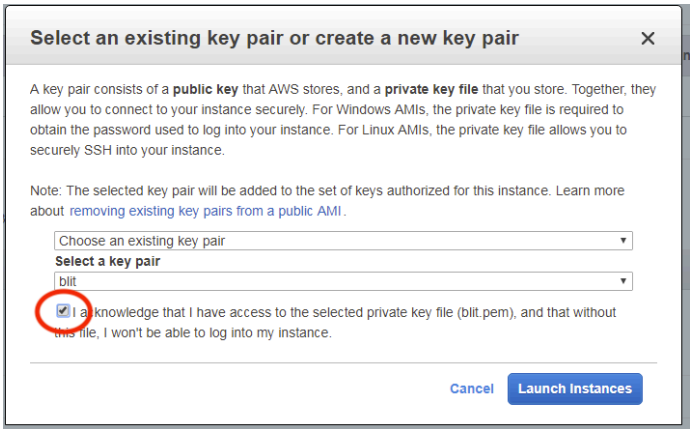


12. Set the “Key” field to “Name” and the “Value” field to “<your ID>-manual-instance”

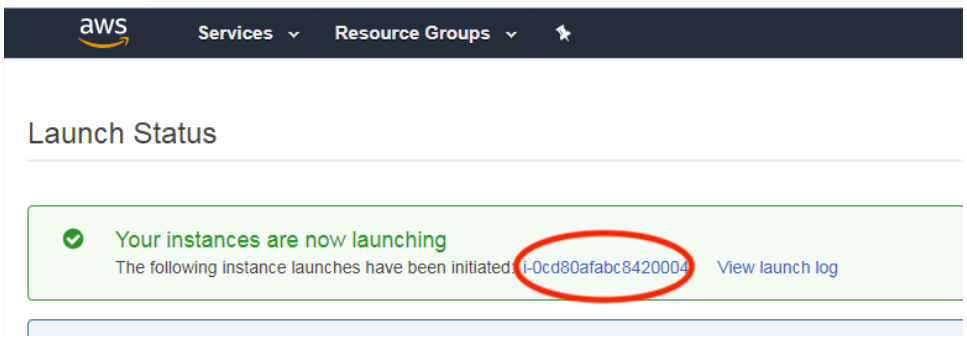
13. Click on “Review and Launch” at the bottom right of the page



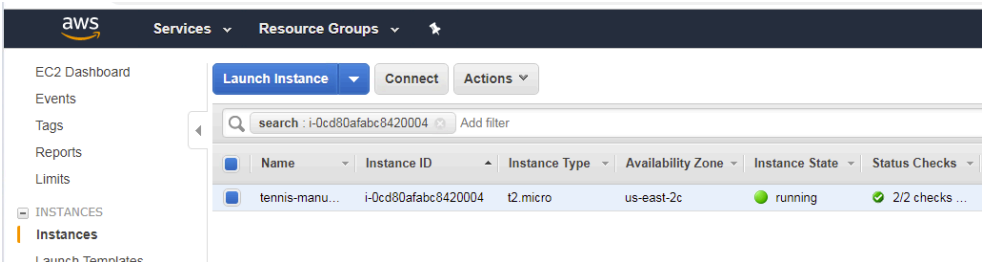
14. Click “Launch” on the next page provided.
15. Check the box marked below and click “Launch Instances”



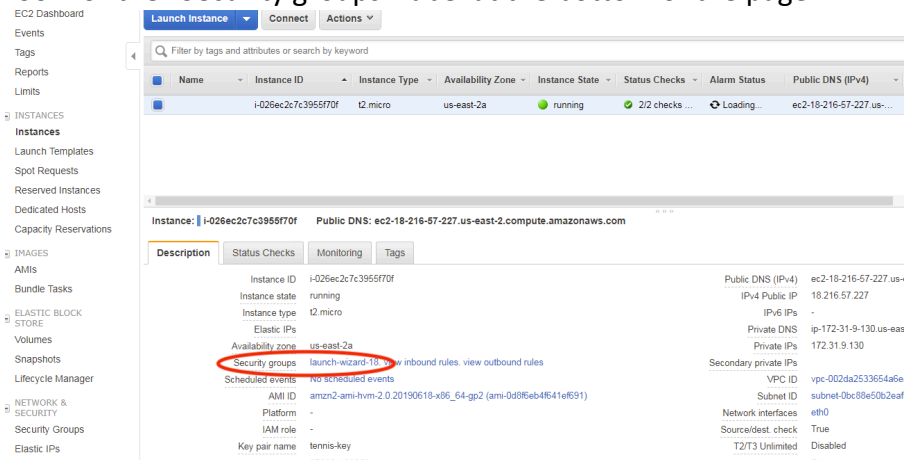
16. On the next page presented, click on the instance number link



17. This will take you to the ec2 dashboard. You will see your instance running there
18. Wait until the “instance state” is “running” and the “Status Checks” is “2/2 checks”

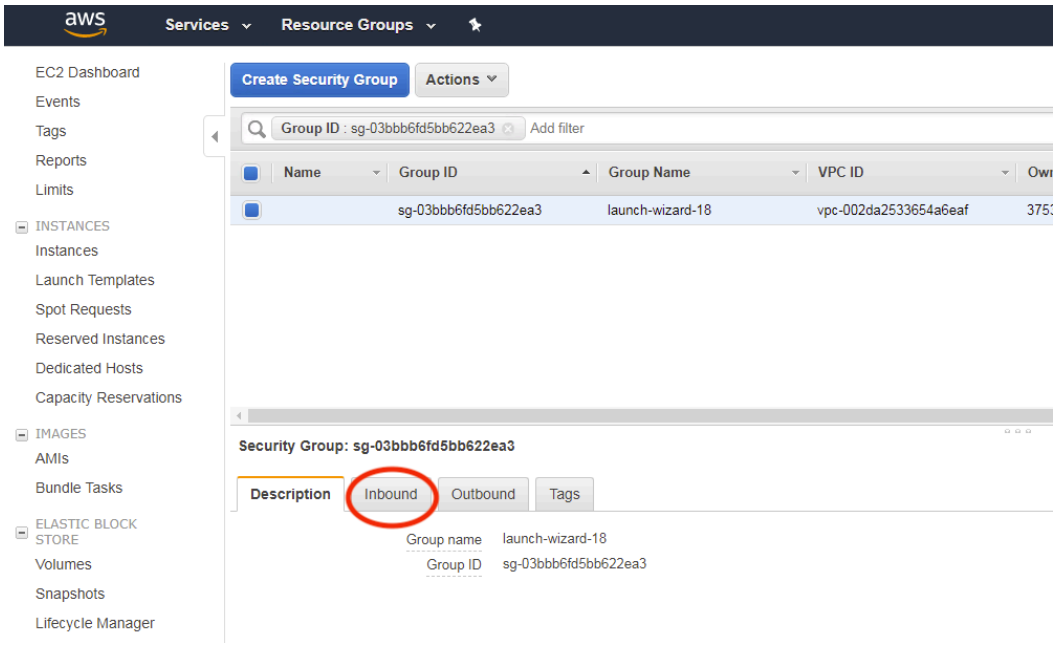


19. Look for the “Security groups” label at the bottom of the page

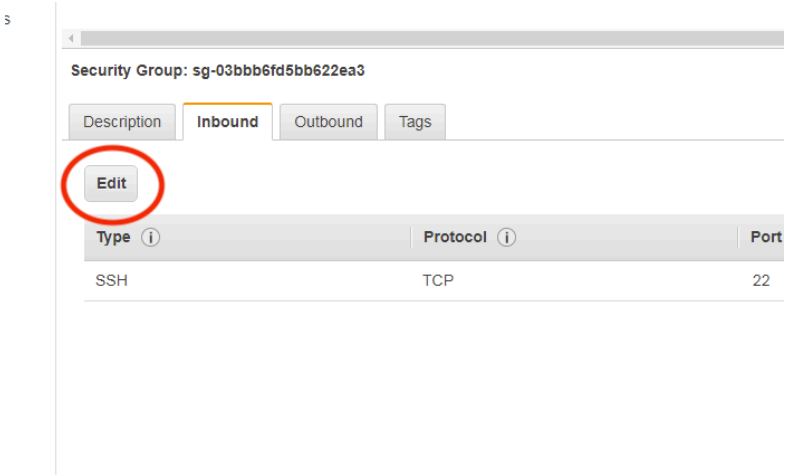


20. Click on the link next to “Security groups”. It should be something like “launch-wizard-xx”.

21. You will get a page that looks like this (below). Click on the “Inbound” tab

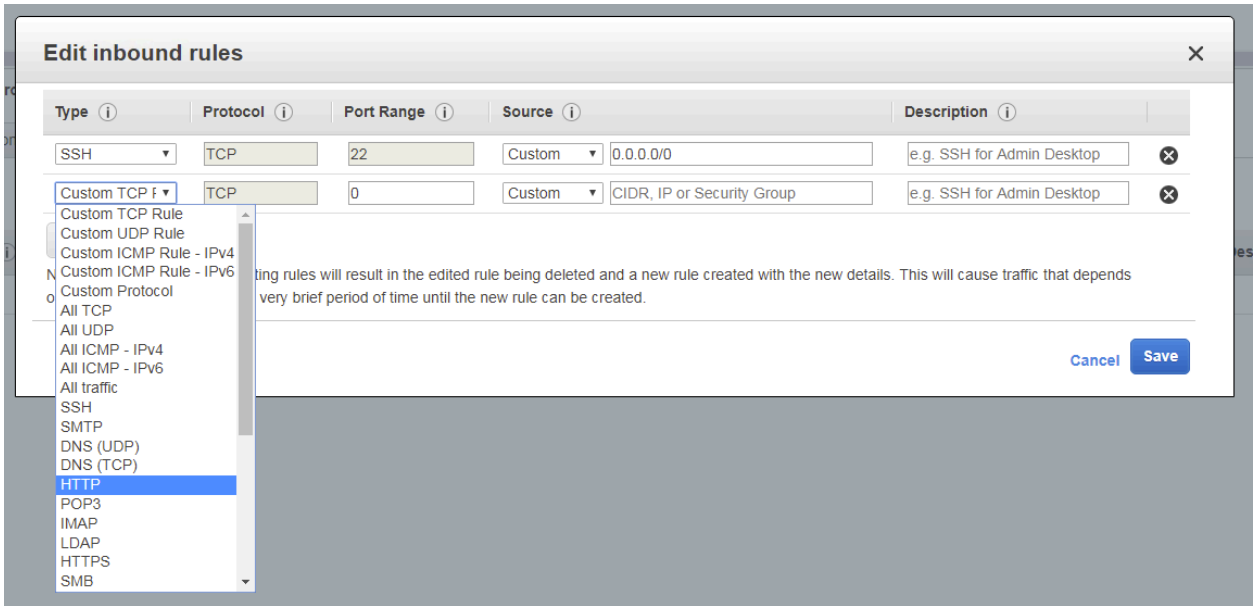


22. Click on the “Edit” button



23. Click on the “Add Rule” button in the dialog presented

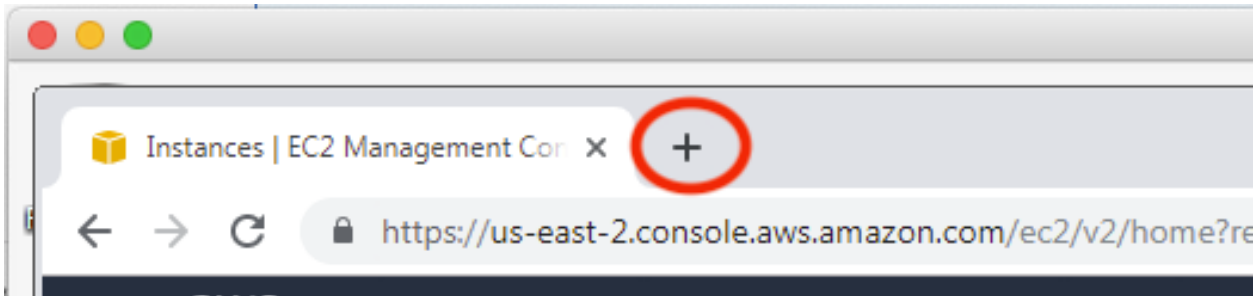
24. Select “HTTP” from the fold-down menu of the newly-added field



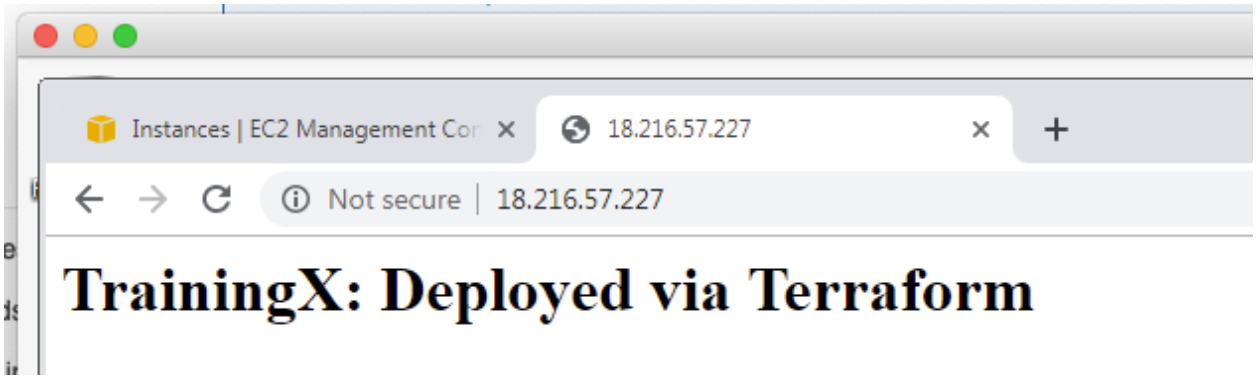
25. Accept the defaults. The dialog box shown should now look like this

26. Click the “Save” button
27. Click just to the right of the “IPv4 Public IP” field and you will get a copy of the address

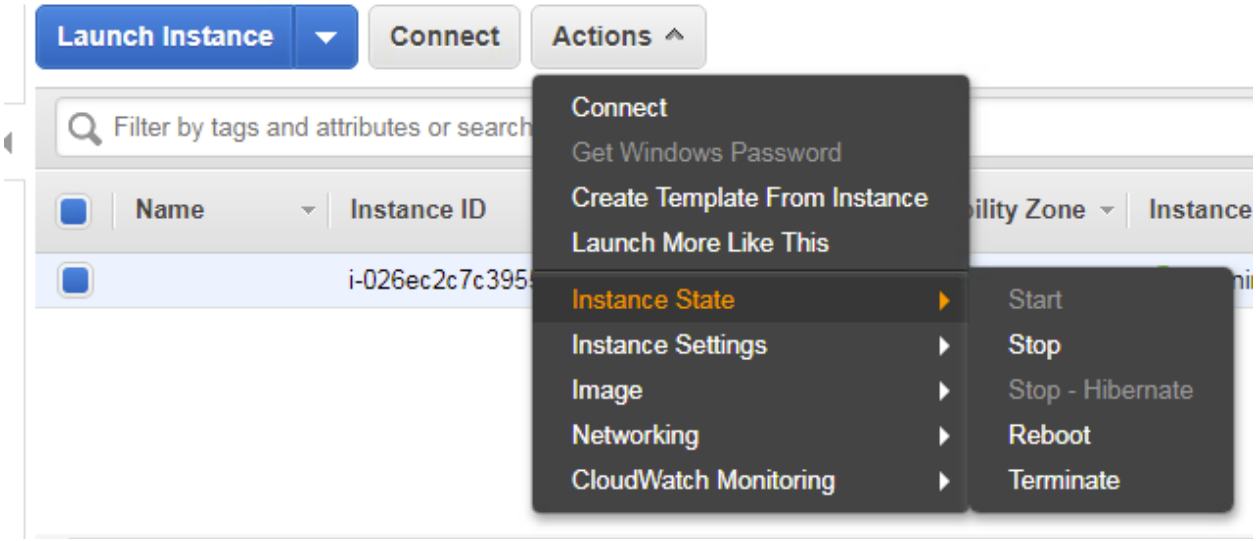
28. Click on the + sign in your browser and open a new tab



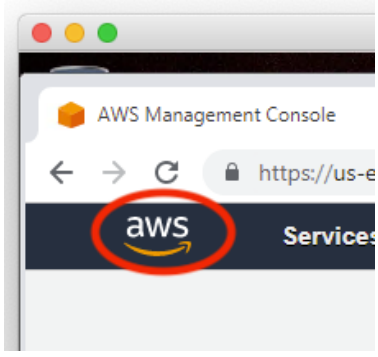
29. In that new tab, paste the address you just copied, and press enter
30. You should see something like this



31. Close the tab
32. Go back to the previous tab and select your running instance
33. Click on the “Actions”->”Instance State”->”Terminate” menu item



34. On your browser, click on the AWS logo in the upper left. This will take you back to the main management console screen

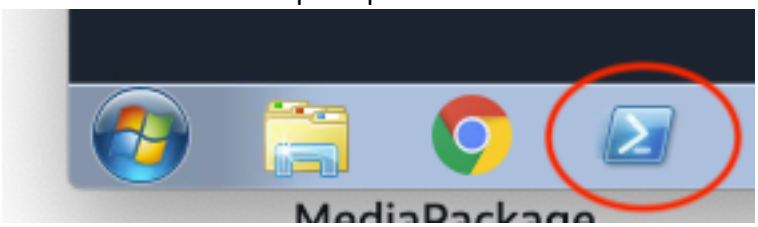


35. Repeat steps 4 through 34. This time change the string “TrainingX” in step 9 to match your Training ID (ex. “Training99”).

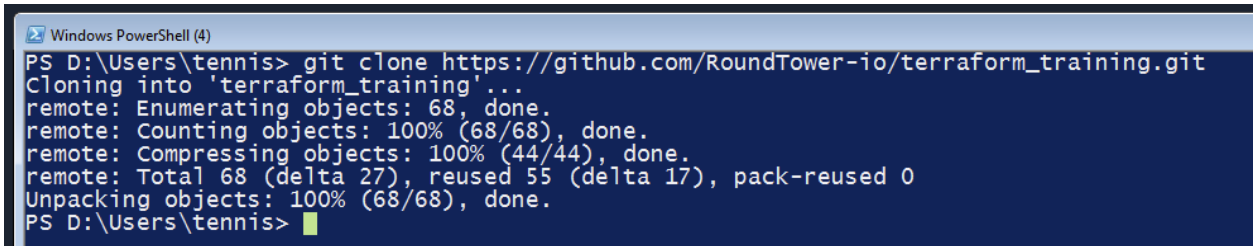
Lab2: Starting and stopping an instance with Terraform

Objective: Demonstrate how much easier it is to create/destroy instances using Terraform. This is an example of Infrastructure as Code (IaC).

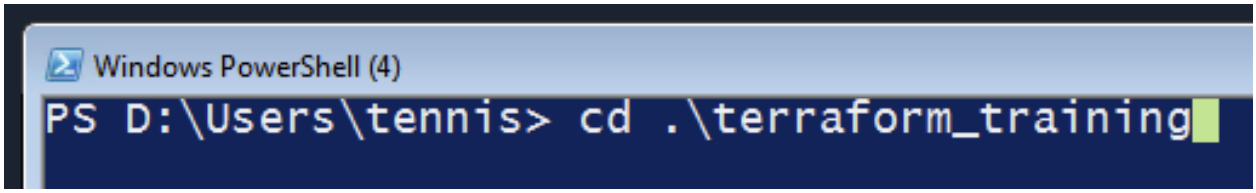
1. Click on the command prompt icon at the bottom left of the WorkSpace screen



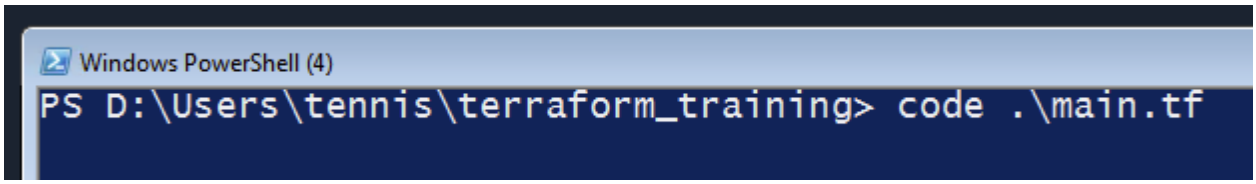
2. Clone a copy of https://github.com/RoundTower-io/terraform_training.git



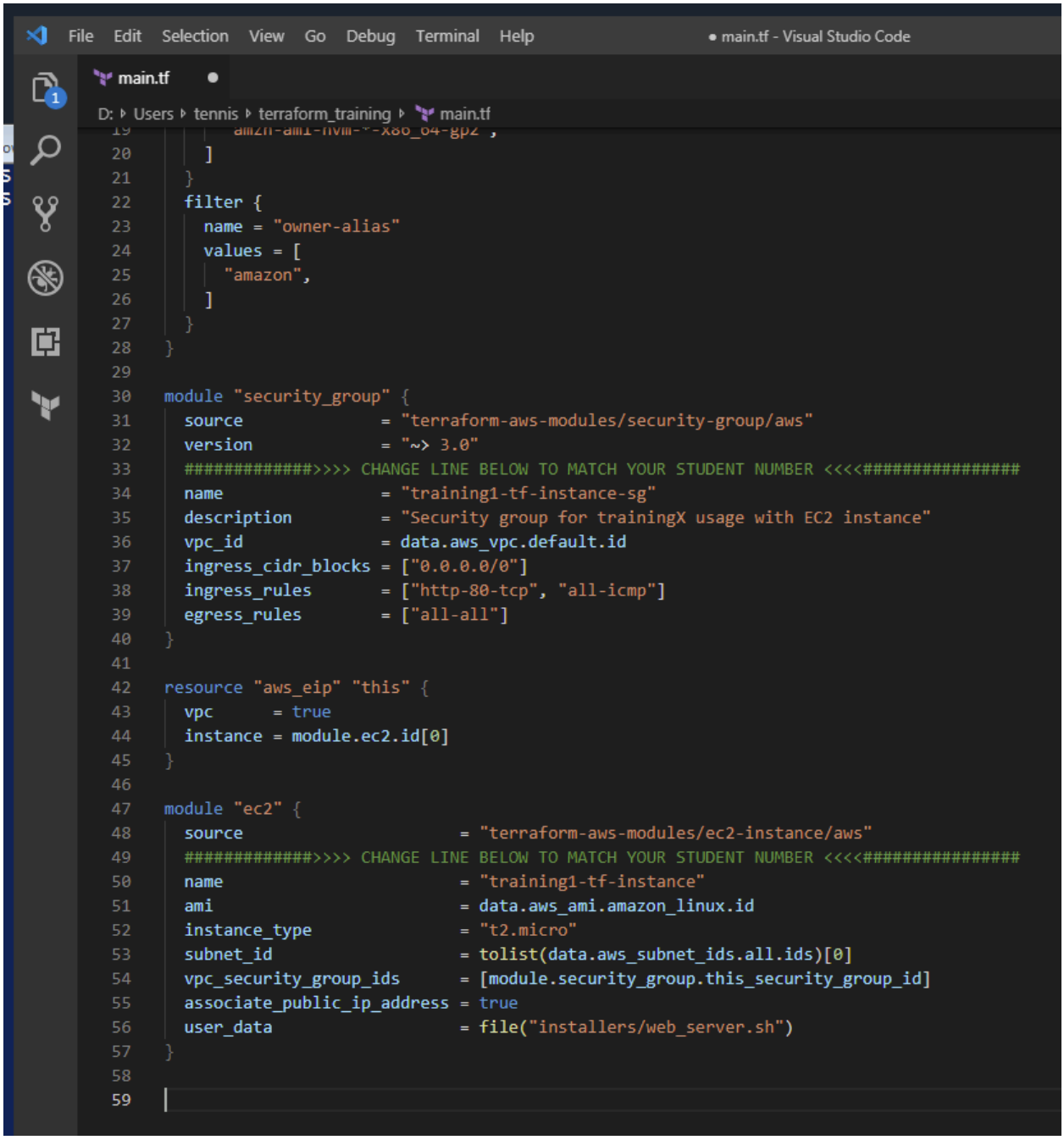
3. Change directory into "terraform_training"



4. Edit the file "main.tf"

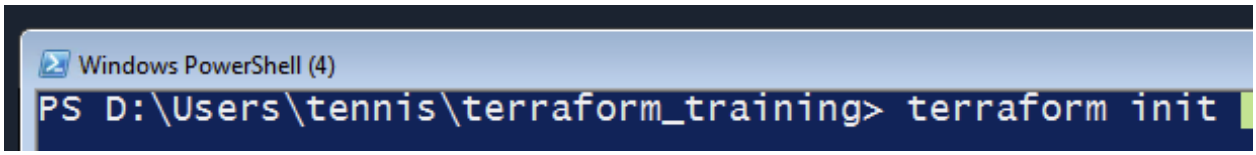


5. Scroll to the bottom of the file and change the values directed by the instructions in the file

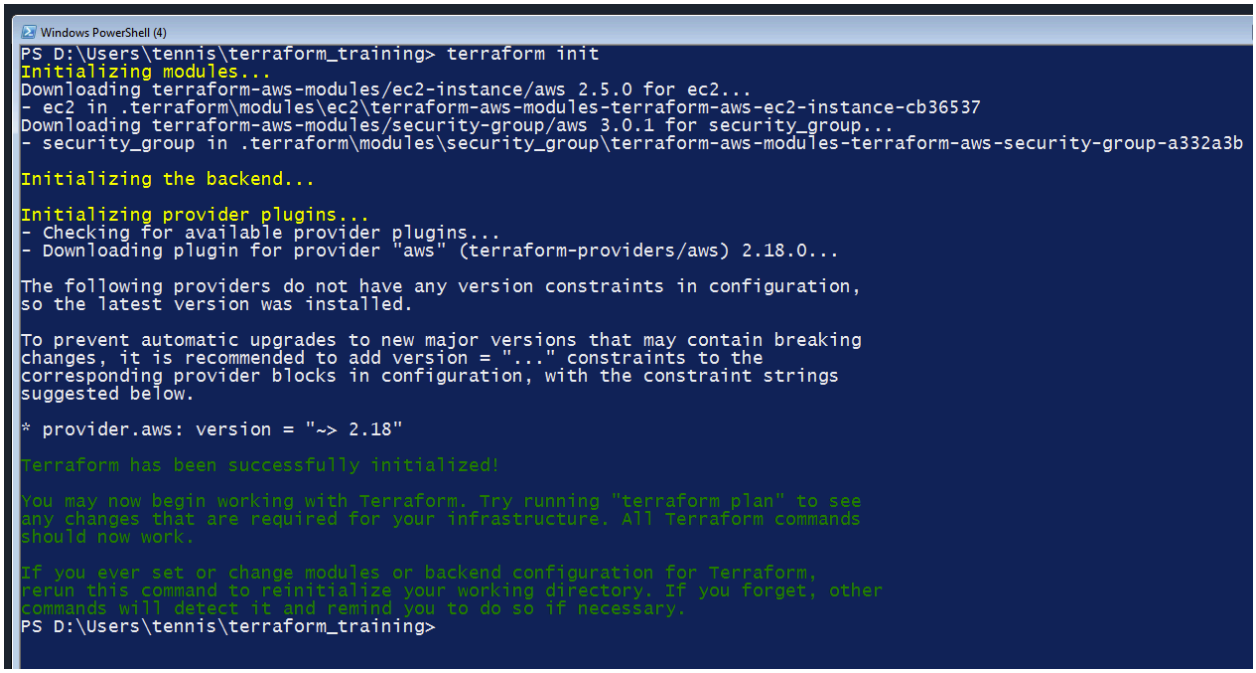


6. Take note that value on line 50 will be the name of your ec2 instance. For example, if your training ID is “3”, your ec2 instance will be named “training3-tf-instance”
7. Make sure you set the training ID’s correctly.
8. Save and exit the file

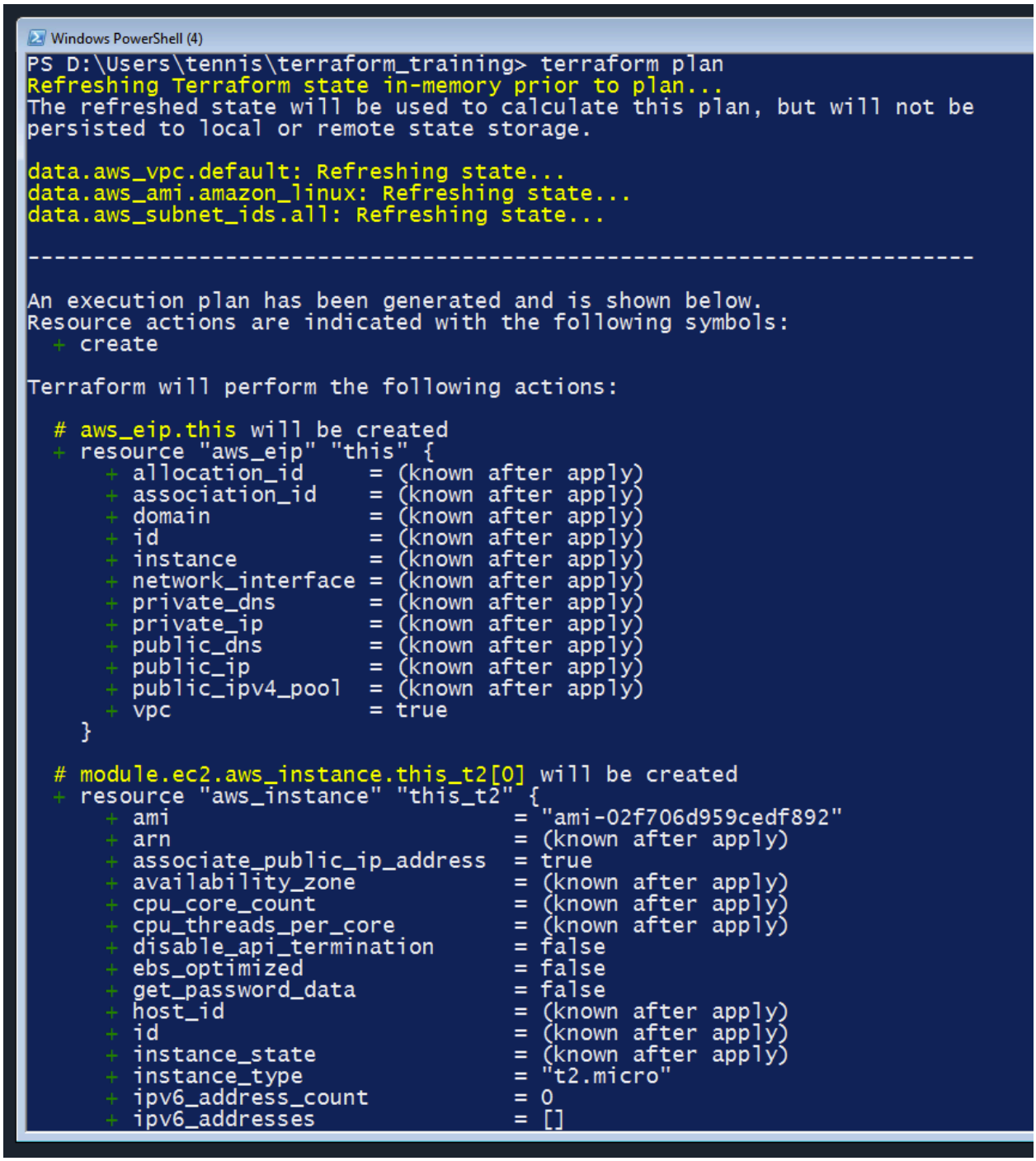
9. Initialize terraform by typing “terraform init”



10. The output should look something like this

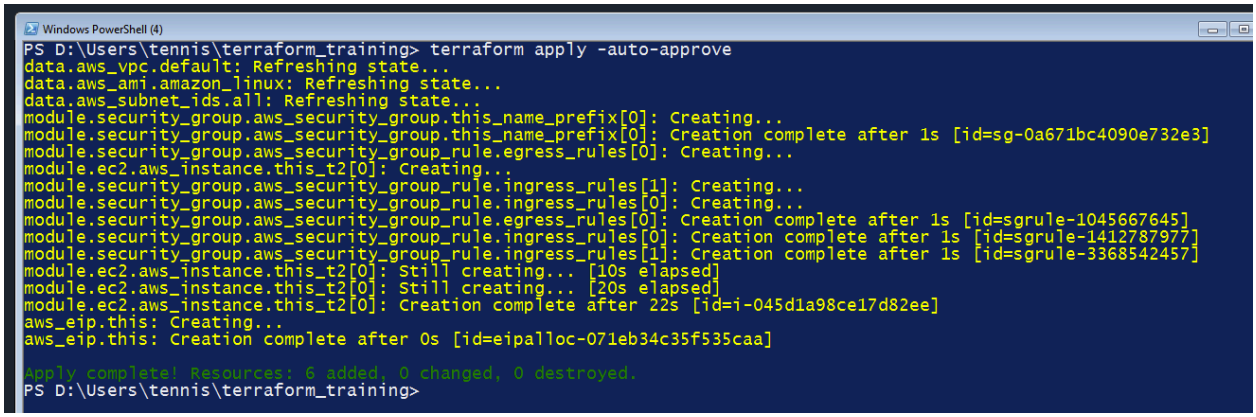


11. Now, we will test that our terraform script will run correctly. Type in “terraform plan”



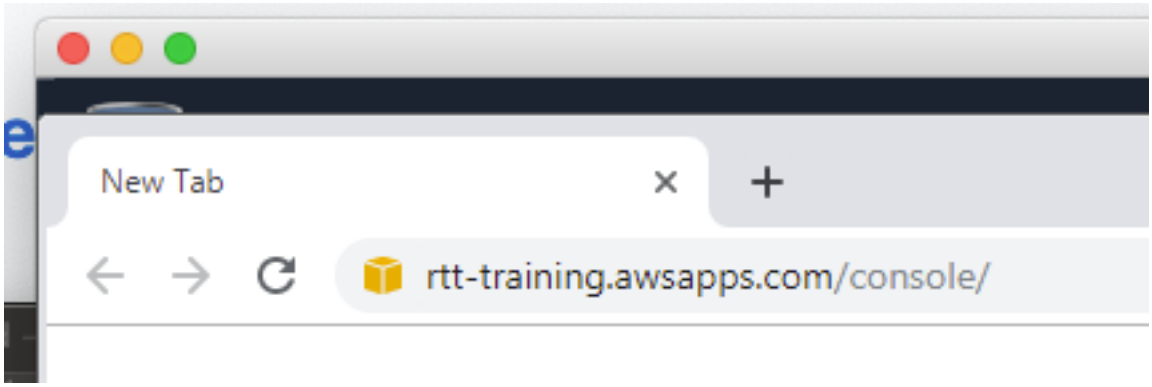
12. If we don’t get any errors, we will now try to run the script

13. Type in “terraform apply -auto-approve” and hit enter. The output should look something like this

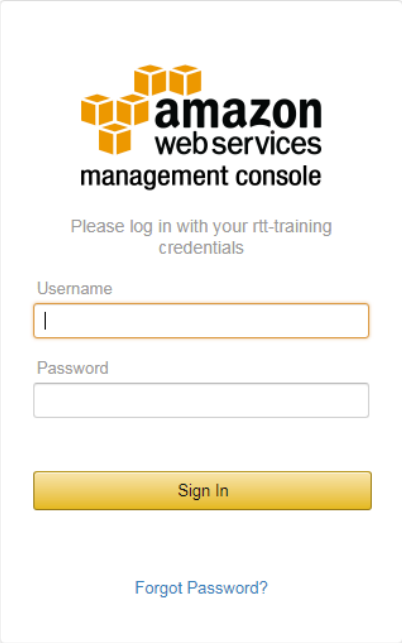


14. Open a browser in the WorkSpace

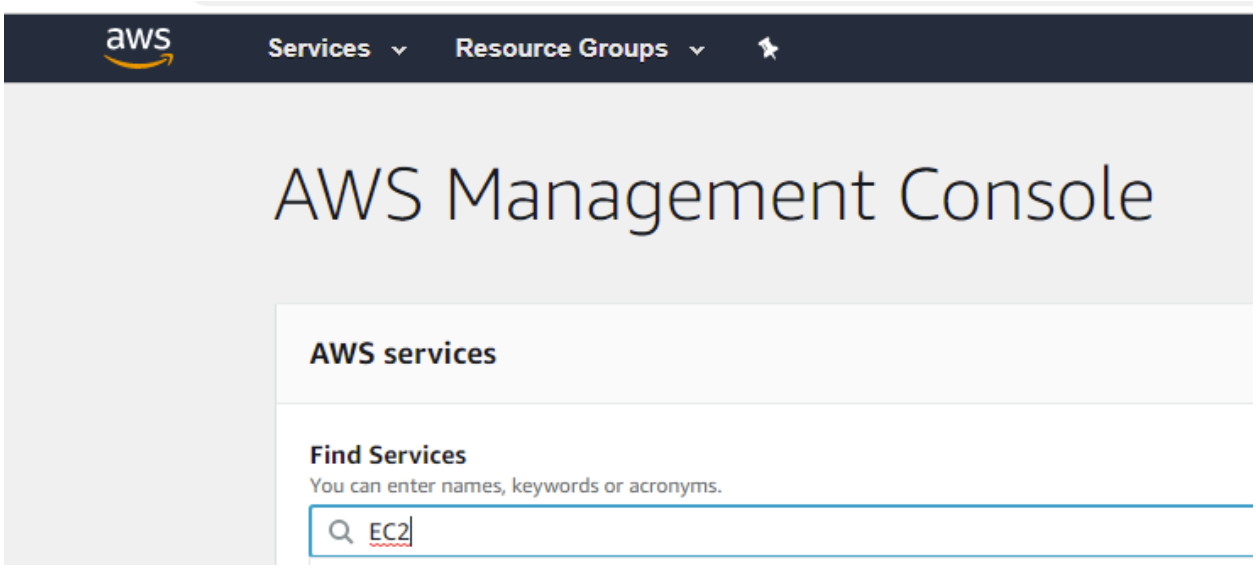
15. Go to this url: http://rtt-training.awsapps.com/console/



16. Login using the same user ID/password combination you used to login to the WorkSpace

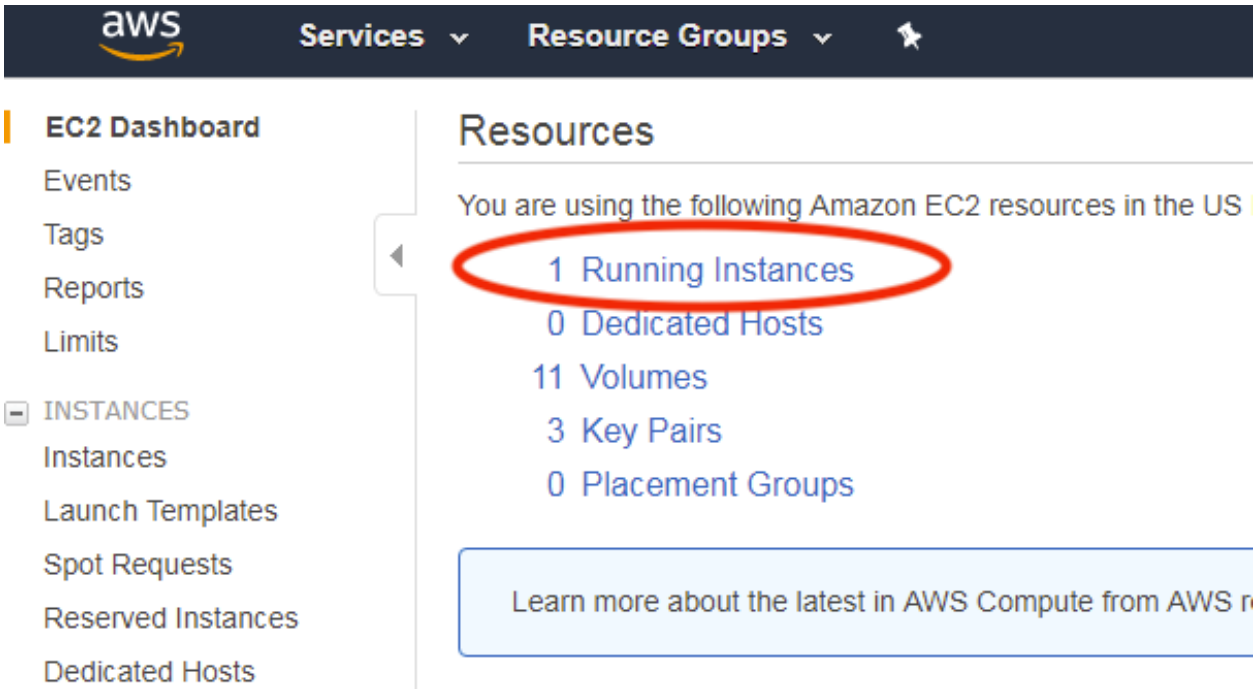


17. This will take you to the main “AWS Management Console”. Type in “EC2” in the “Find Services” search box and hit enter

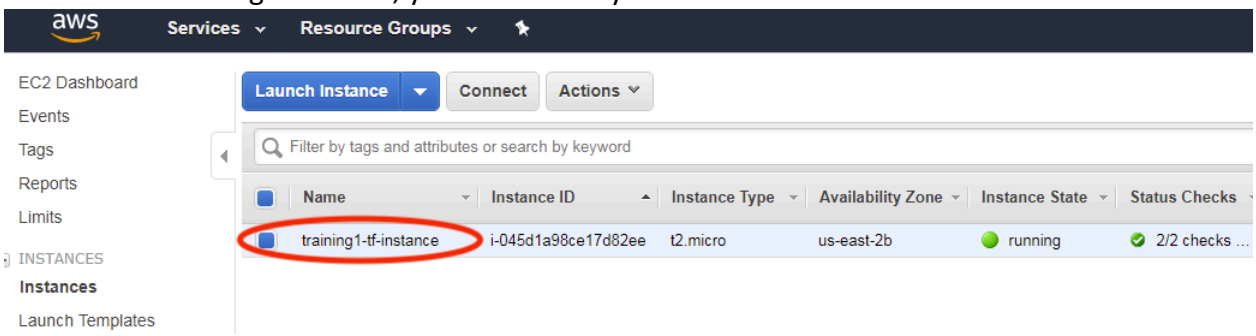


18. This will take you to the main EC2 console.

19. Click on the “Running Instances” link

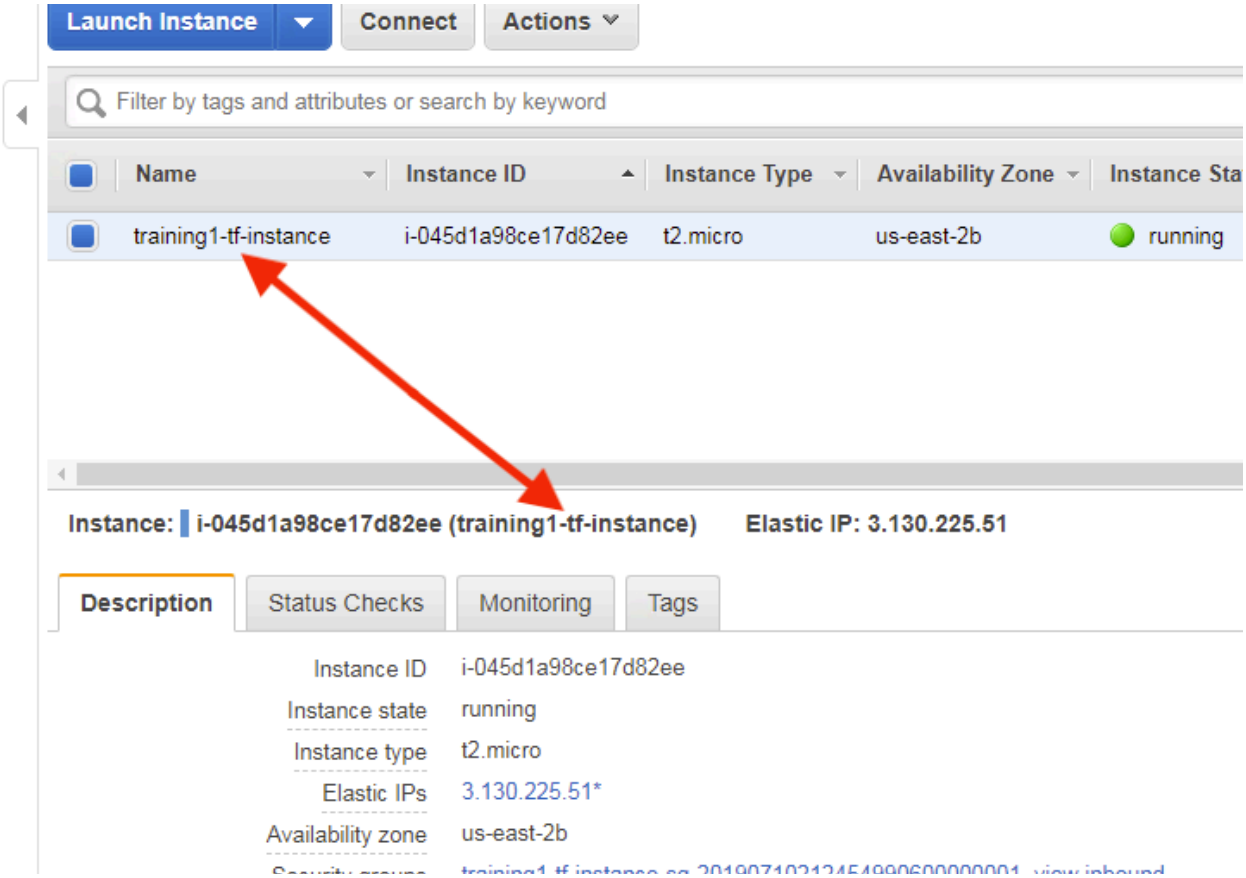


20. In the list of running instances, you should see your own



21. Select your instance by clicking on the radio button next to the name (above)
22. Wait until the “instance state” is “running” and the “Status Checks” is “2/2 checks”

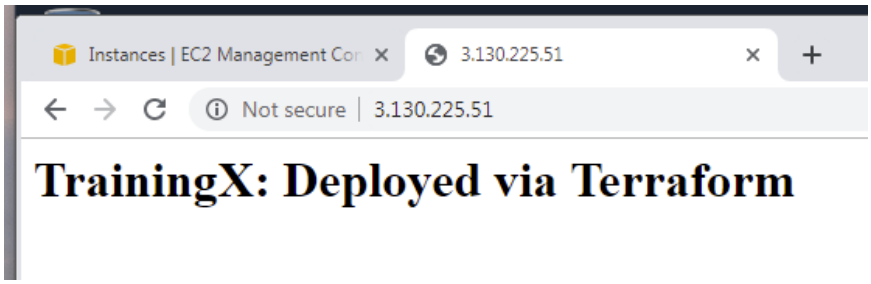
23. Below the selected instance, you should now see a pane with lots of details about your instance



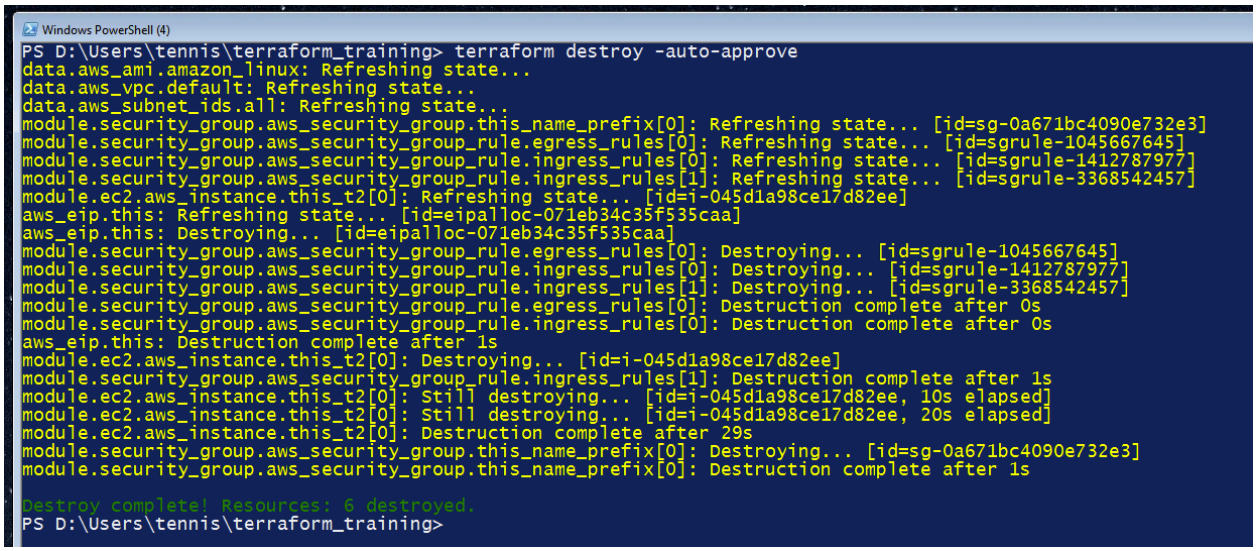
24. Look for the "IPv4 Public IP" on the right and make a copy of it

25. Open a new tab in your browser
26. Paste the ip address on the address line of the browser

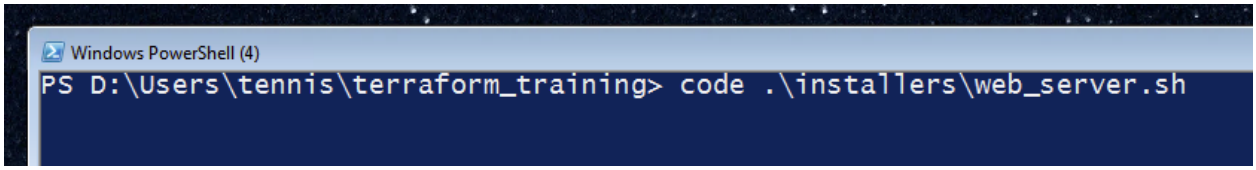
27. You should see something like this



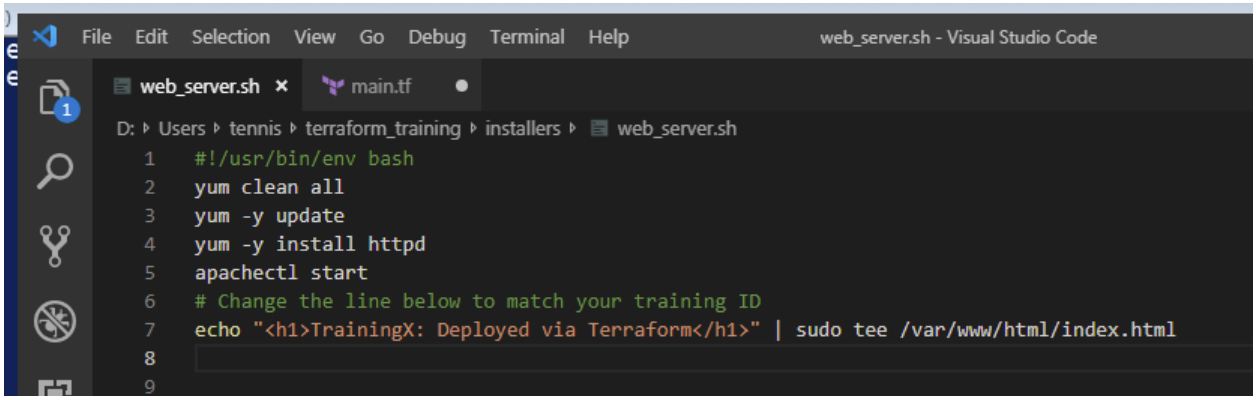
28. The website works, but the training number is wrong. Lets fix that.
29. Go back to your command line window and type “terraform destroy -auto-approve”



30. Now, edit the file “installers/web_server.sh”

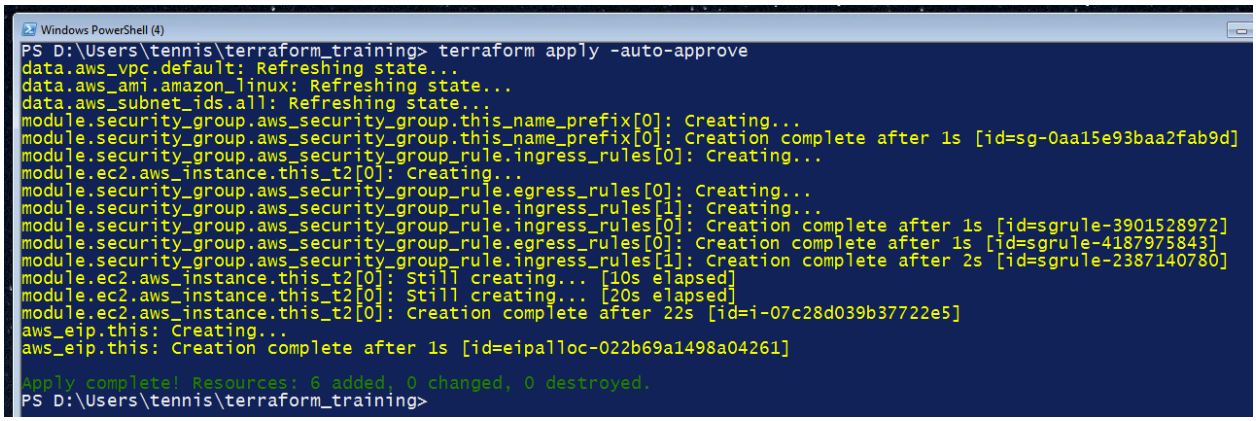


31. Change the training ID value on line 7 to your training ID number

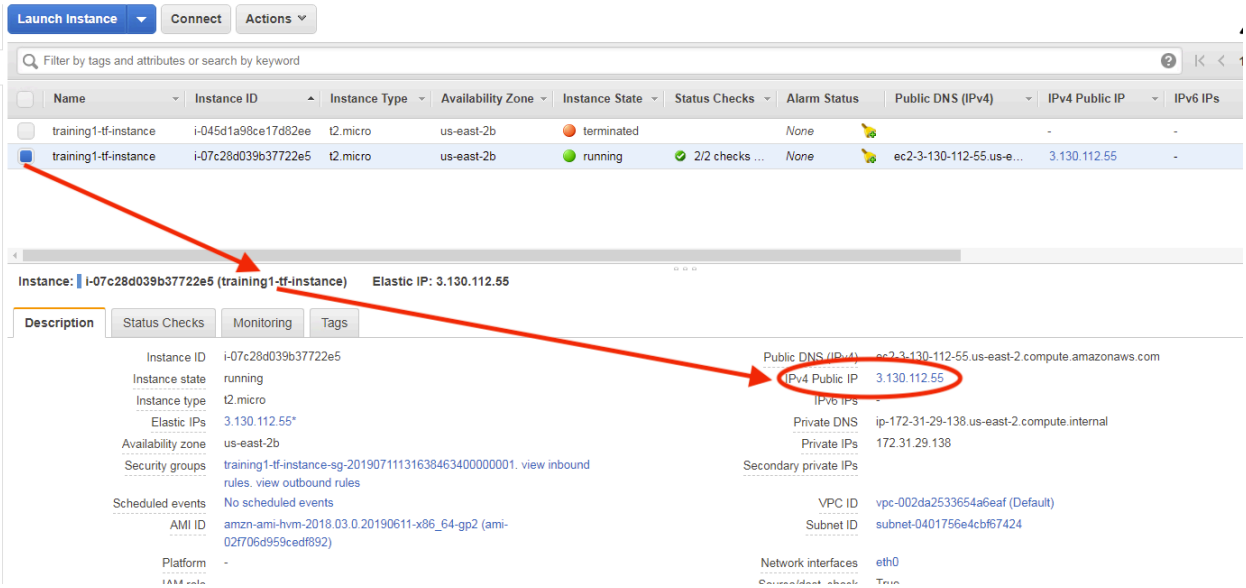


32. Save and close the file

33. Create a new ec2 instance with “terraform apply”



34. Again, switch over to your browser and look for the new ec2 instance
35. Locate the new instance’s ip address



36. Open a new tab in your WorkSpace browser, plug in that address, and hit enter

37. Switch back to your command line and type “terraform destroy -auto-approve”