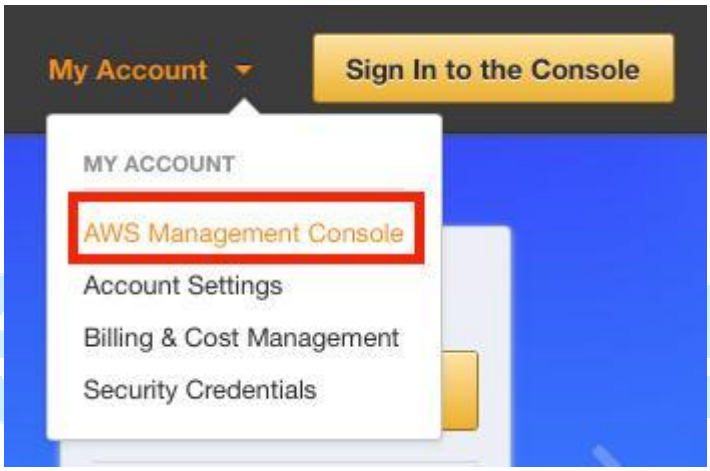
Creating an Amazon EC2 Linux Instance

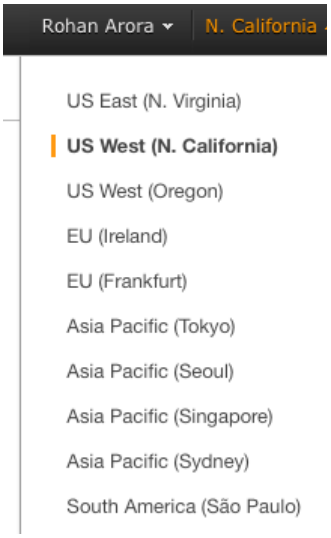
Overview

This lab leads you through the steps to launch and configure your first virtual machine in the Amazon cloud. You will learn about using Amazon Machine Images to launch Amazon EC2 instances, creating key pairs for SSH authentication, securing network access to EC2 instances with security groups and automatically configuring EC2 instances with bootstrapping scripts. At the end of this lab you will have deployed a simple web server which includes an informational page to display results of your virtual web server instance.

1. Login to AWS Management Console.

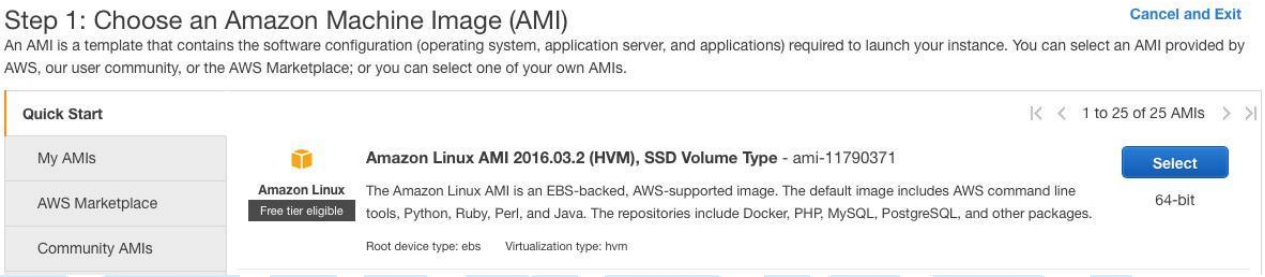


2. Select your preferred Region.

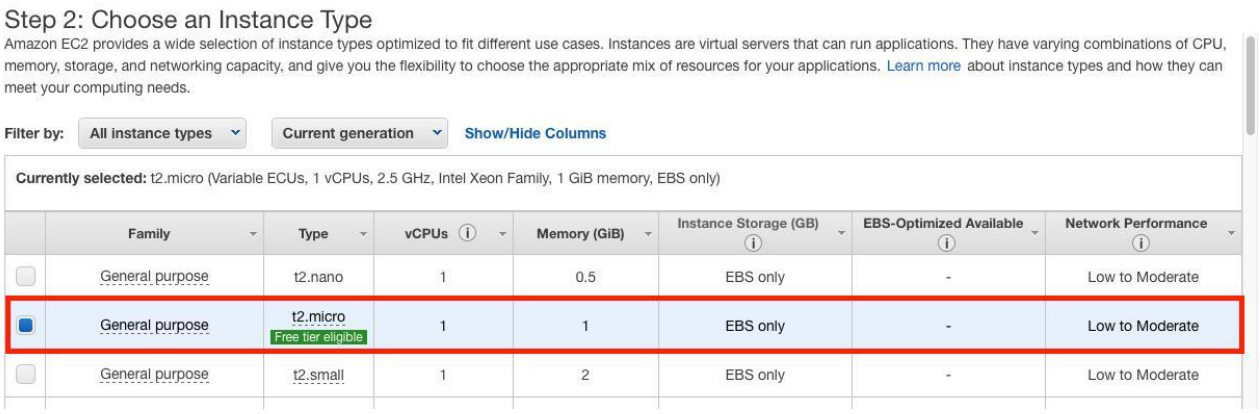


3. Click EC2 under Compute section. This will take you to EC2 dashboard.

4. Click Launch Instance.
5. Because you require a Linux instance, in the row for the basic 64-bit Amazon Linux AMI, which will normally be the first option on the list, click Select.

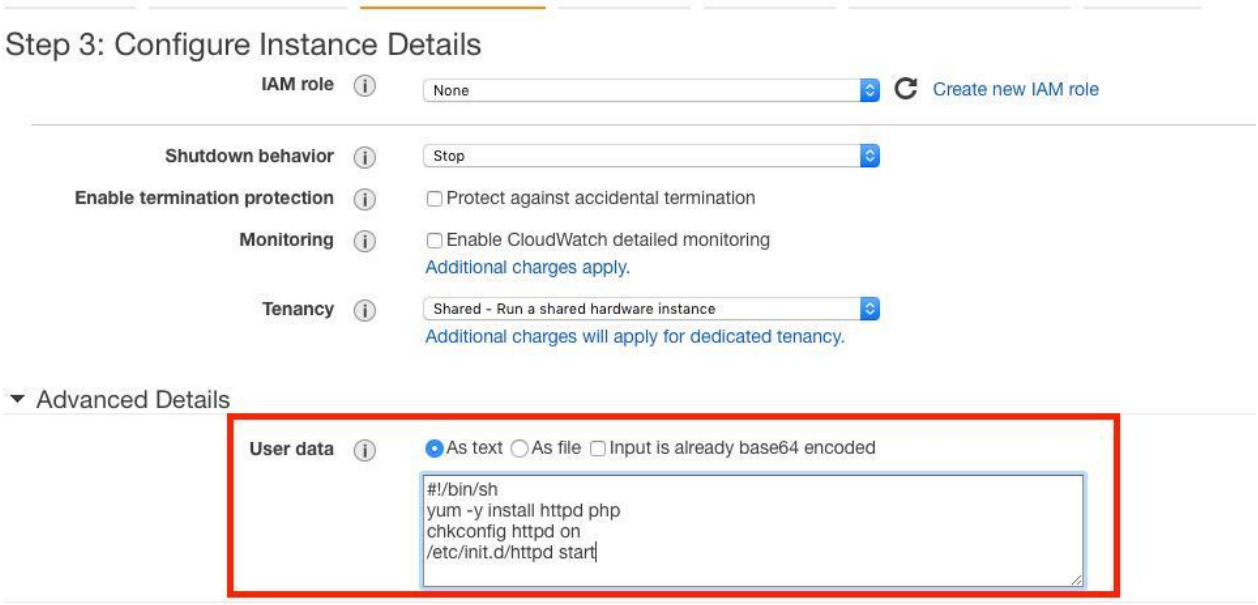


6. On the Choose an Instance Type page, choose t2.micro, which is free tier eligible.



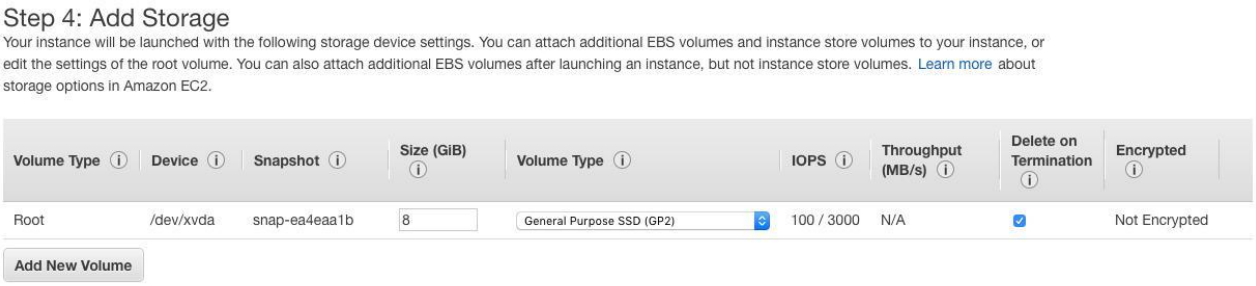
7. Click Next: Configure Instance Details.
8. On the Configure Instance Details page, scroll down and expand Advanced Details section.
9. For User Data, select As Text.
10. Copy and paste following script into the User Data box.

```
#!/bin/sh
yum -y install httpd php
chkconfig httpd on
/etc/init.d/httpd start
```



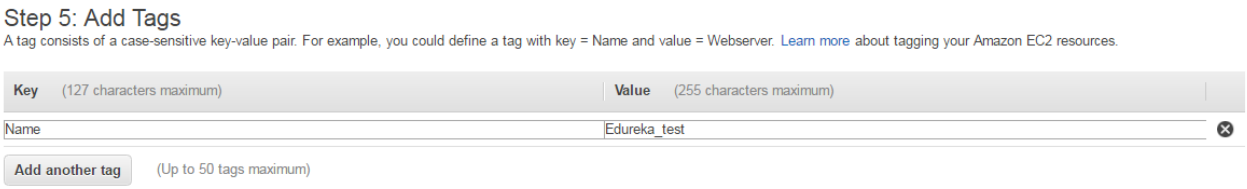
11. Click Next: Add Storage.

→ This page displays which EBS volumes are attached to your image. When you launch an EC2 instance, the root volume contains the image used to boot the instance. Instances that use EBS for root device automatically have an EBS volume attached. When an EBS-backed instance is launched, an EBS volume is created for each EBS snapshot referenced by the AMI. You must have at least one snapshot that denotes the root device; the others are optional and denote additional volumes to be created from other snapshots.



12. Click Next: Tag Instance to accept the default storage device configuration.

13. On the Tag Instance page, type a name for your instance in the Value box. This name, more correctly known as tag, will appear in the console when the instance launches. It makes it easy to keep track of running machines in a complex environment. Use a name that you can easily recognize and remember.



14. Click Next: Configure Security Group.

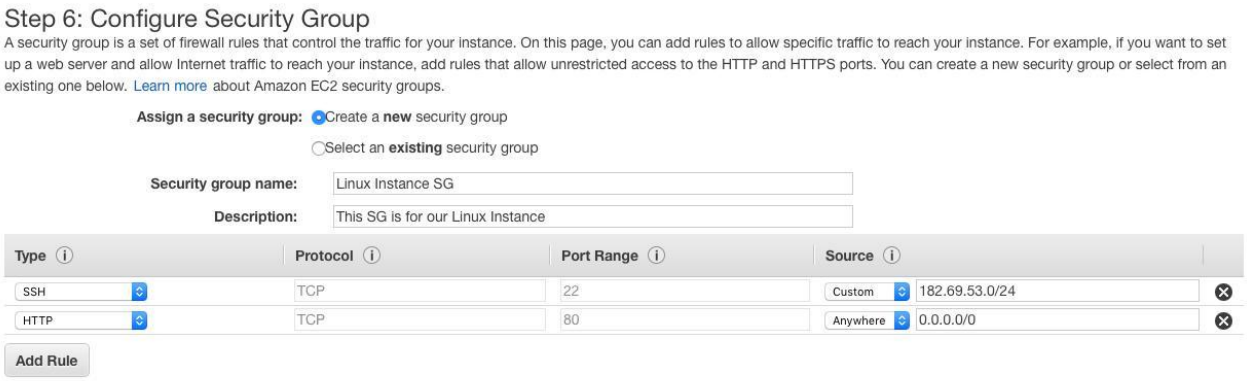
→ Now you will create security group. A security group acts as a firewall that controls the traffic allowed into a group of instances. When you launch an EC2 instance, you can assign it to one or more security groups. For each security group, you add rules that govern the allowed inbound traffic to instances in the group. All other inbound traffic is discarded. You can modify rules for a security group at any time. The new rules are automatically enforced for all existing and future instances in the group.

15. For Assign a security group, click Create a new Security group.
16. In the Security group name box, type a name that you would like to assign to this security group.
17. (Optional) type a description for your security group.

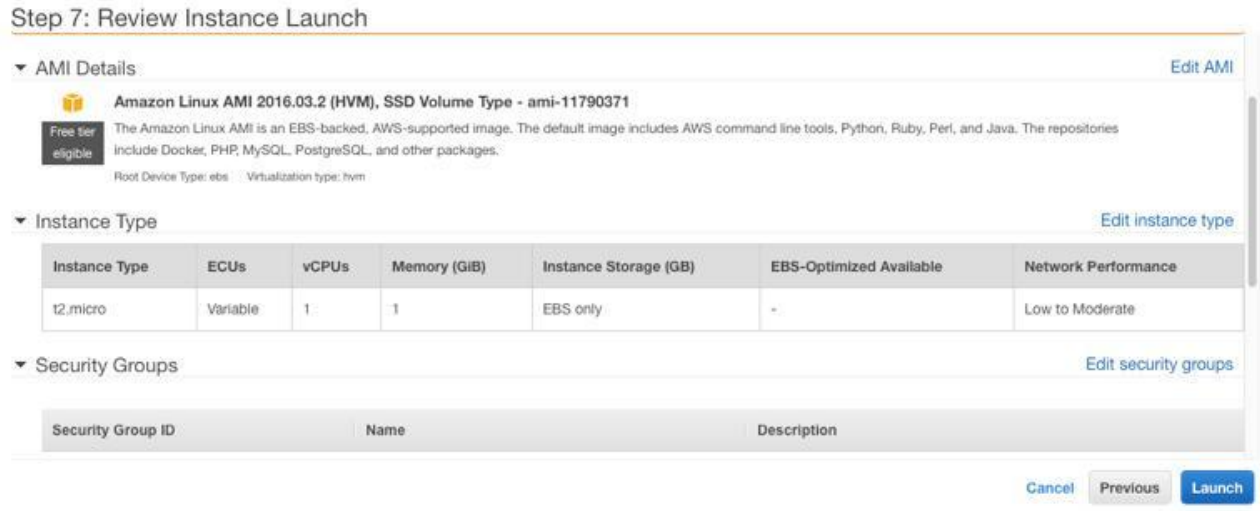
→ By default, AWS creates a rule that allows Secure Shell (SSH) access from any IP address. It is highly recommended that you restrict terminal access to the ranges of IP addresses (e.g., IPs assigned to machines within your company) that have a legitimate business need to administer to your EC2 instance.

18. Click Add Rule to open a new port.
19. In the Type drop-down list, click HTTP.

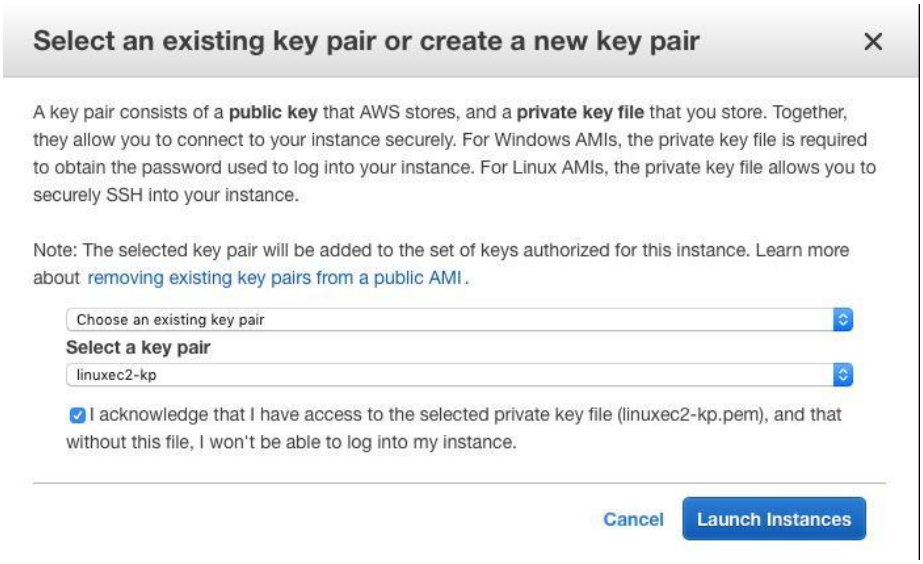
→ This will add a default handler for HTTP that will allow requests from anywhere on the internet. Since you want this web server to be accessible to the general public, you can leave this rule as is without any further configuration.



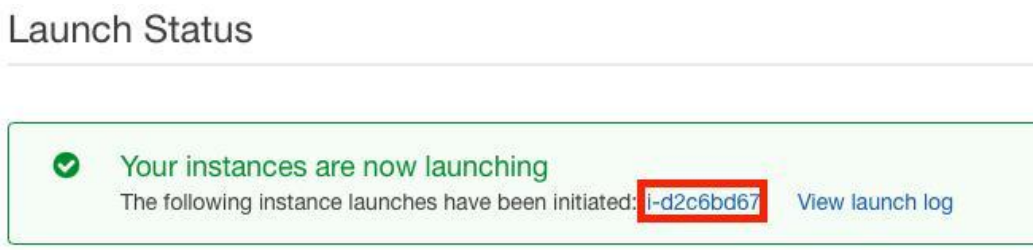
20. Click Review and Launch.
21. Review your choices, and then click Launch.



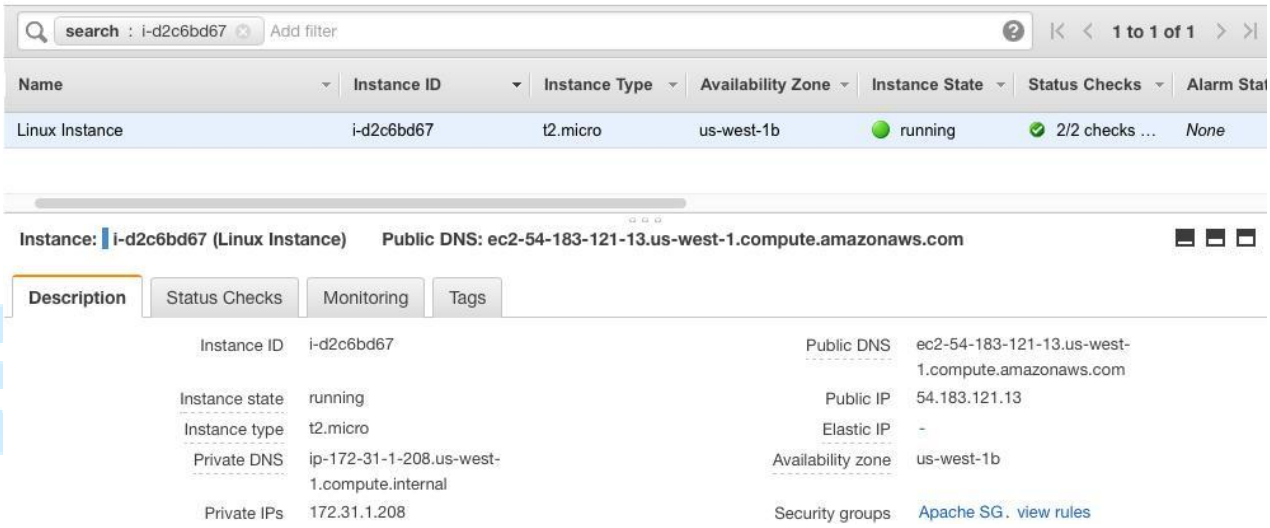
22. Choose an existing key pair and select the acknowledgement check box.



23. Click Launch Instances.
24. On the status page, which notifies you that your instances have been initiated, click on instance ID.



25. Select your instance to display a list of details and status update in the lower pane.



Instructions for Windows Users: Connecting to EC2 instance via SSH

→ In this section, you will use the PuTTY Secure Shell (SSH) client and your server's public DNS address to connect to your server.

→ All EC2 instances are assigned two IP addresses at launch: a private IP address (RFC 1918) and a public IP address that are directly mapped to each other through Network Address Translation (NAT). Private IP addresses are only reachable form within Amazon EC2 network. Public IP addresses are reachable from the internet.

→ EC2 also provides an internal DNS name and public DNS name that map to the private and public IP addresses, respectively. The internal DNS name can only be resolved within Amazon EC2. The public DNS name resolves to the public IP address outside the EC2 network, and to the private IP address within the EC2 network.

Converting Your Private Key Using PuTTYgen

→ PuTTY does not natively support the private key format (.pem) generated by Amazon EC2. PuTTY has a tool named PuTTYgen, which can convert keys to the required PuTTY format (.ppk). You must convert your private key into this format (.ppk) before attempting to connect to your instance using PuTTY.

26. Start PuTTYgen (for example, from the Start menu, click All Programs > PuTTY > PuTTYgen).

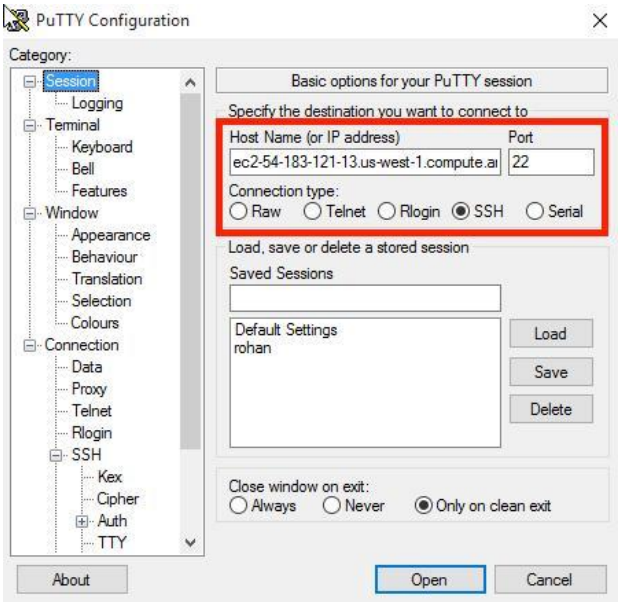
27. Under Type of key to generate, select SSH-2 RSA.

28. Click Load. By default, PuTTYgen displays only files with the extension .ppk. To locate your .pem file, select the option to display files of all types.

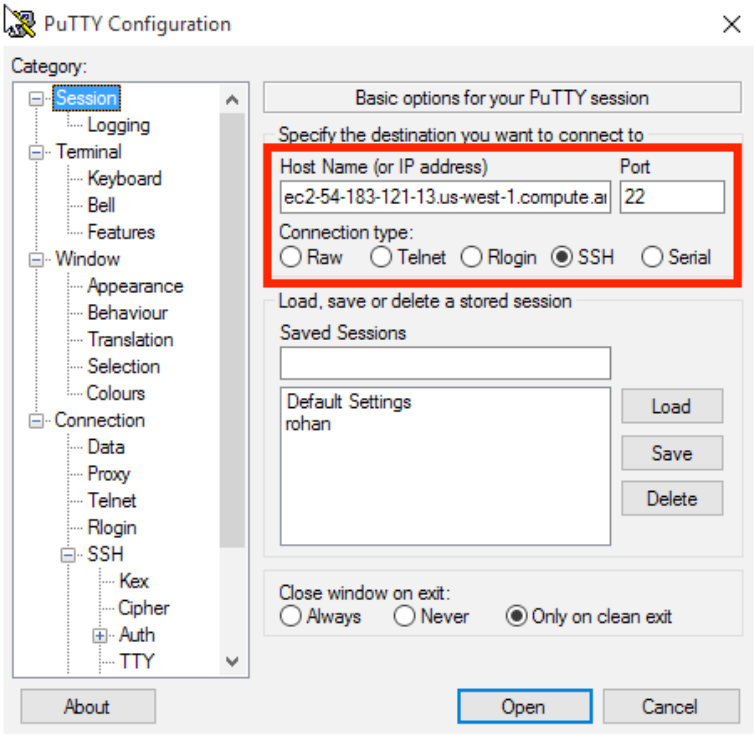
29. Select your.pem file for the key pair that you specified when you launch your instance, and then click Open. Click OK to dismiss the confirmation dialog box.
30. Click Save private key to save the key in the format that PuTTY can use. PuTTYgen displays a warning about saving the key without a passphrase. Click Yes.
31. Specify the same name for the key that you used for the key pair (for example, my-key-pair). PuTTY automatically adds the. ppk file extension.

Connect to EC2 instance using SSH and PuTTY

32. Open PuTTY.exe
33. In the Host Name box, enter either Public DNS or Public IP of your instance.



34. In the Category list, expand SSH.
35. Click Auth (don't expand it).
36. In the Private Key file for authentication box, browse to the PPK file that you downloaded and double-click it.
37. Click Open.



38. Click Yes when prompted to allow a first connection to this remote SSH server. Because you are using a key pair for authentication, you will not be prompted for a password.
39. Type in ec2-user when prompted for login ID.

```
login as: ec2-user
Authenticating with public key "imported-openssh-key"
Last login: Tue Jun 28 07:15:24 2016 from 122.162.216.136

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       _|  (     /   Amazon Linux AMI
      ___|\___|___|

https://aws.amazon.com/amazon-linux-ami/2016.03-release-notes/
1 package(s) needed for security, out of 3 available
Run "sudo yum update" to apply all updates.
[ec2-user@ip-172-31-1-208 ~]$
```

Connect to EC2 instance using OpenSSH CLI client

40. Open the Terminal application.
41. Enter the following commands.

chmod 400 *<private key file>*
ssh –i <private key file> ec2-user@*<public IP address>*

```
Rohans-MacBook-Pro:~ rohanarora$ cd Documents
Rohans-MacBook-Pro:Documents rohanarora$ chmod 400 linuxec2-kp.pem
Rohans-MacBook-Pro:Documents rohanarora$ ssh -i linuxec2-kp.pem ec2-user@54.183.
121.13
The authenticity of host '54.183.121.13 (54.183.121.13)' can't be established.
ECDSA key fingerprint is SHA256:f0g3aIfYT7DQdnb5Qy5lHvjv75A8vUMsC0OQhkMRZEc.
Are you sure you want to continue connecting (yes/no)? yes
```

Create a PHP Web Page on Your Linux Web Server

→ The AMI has already been customized with the installation of Apache and PHP from the script you entered as user data when the instance was launched. Modify the web server by adding an index.php file.

42. Copy the following commands into PuTTY. This will create an index.php file at the root of your HTTP web server's HTML document directory.

cd /var/www/html

sudo nano index.php

43. Copy the following code and paste to Nano:

```
<?php
 $url = "http://169.254.169.254/latest/meta-data/instance-id";
 $instance_id = file_get_contents($url);
 echo "Instance ID: <b>" . $instance_id . "</b><br/>";
 $url = "http://169.254.169.254/latest/meta-data/placement/availability-zone";
 $zone = file_get_contents($url);
 echo "Zone: <b>" . $zone . "</b><br/>";
?>
```

```
  GNU nano 2.5.3                File: index.php

<?php
  $url = "http://169.254.169.254/latest/meta-data/instance-id";
  $instance_id = file_get_contents($url);
  echo "Instance ID: <b>" . $instance_id . "</b><br/>";
  $url = "http://169.254.169.254/latest/meta-data/placement/availability-zone";
  $zone = file_get_contents($url);
  echo "Zone: <b>" . $zone . "</b><br/>";
?>

                        [ Read 9 lines ]
^G Get Help  ^O Write Out ^W Where Is  ^K Cut Text  ^J Justify   ^C Cur Pos
^X Exit      ^R Read File ^\ Replace   ^U Uncut Text^T To Spell  ^_ Go To Line
```

44. Press CTRL+O, ENTER to save your document as index.php.
45. Press CRTL+X to exit the Nano editor.
46. Close your PuTTY or Terminal window.

View Your Website

→ In this section, you will navigate to your new website and see the content of the page that you just created.

47. Return to AWS Management Console.
48. In your list of running EC2 instances, select the instance to display the instance details.
49. Copy and paste either the Public IP or Public DNS name in your browser. Your instance ID and Availability Zone should be displayed in the browser.

Conclusion

Congratulations! You have now successfully:

→ Learned about basic concepts and terminology of the Amazon Elastic Compute Cloud (EC2) service.

→ Created your own EC2 server instance running Linux in the AWS cloud.

→ Modified it to run a web server with a page that displays machine-specific information.