



Training and
Certification

Creating Amazon EC2 Instances With Windows Self-Paced Lab Guide Version 2.0

self-paced-lab-40-03192014

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Lab Title

Overview

This lab leads you through the steps to launch and configure your first Windows virtual machine in the Amazon cloud. You will learn about using Windows Amazon Machine Images to launch Amazon EC2 Instances, bootstrapping using Powershell, creating Key Pairs for authentication, securing network access to Amazon EC2 Instances with Security Groups and attaching Elastic IPs to Amazon EC2 Instances to provide static internet addresses. At the end of this lab you will have deployed a simple web server and will view the metadata of your Amazon EC2 instance.

Topics Covered

By the end of this lab, you will be able to:

- Create a new Amazon EC2 server instance from an existing server template.
- Create a security group to restrict access to the server's resources.
- Launch the instance.
- Access the instance.
- Associate an Elastic IP address with your Amazon EC2 instance.

Technical Knowledge Prerequisites

To successfully complete this lab, you should be familiar with basic Windows server administration and comfortable using the Windows PowerShell.

Download PuTTY

If you do not already have the PuTTY client installed on your machine, you can download and then launch it from here:

<http://the.earth.li/~sgtatham/putty/latest/x86/putty.exe>

Amazon Elastic Compute Cloud (Amazon EC2)

What is Amazon EC2?

Amazon Elastic Compute Cloud (Amazon EC2) is a web service that provides resizable compute capacity in the cloud. It is designed to make web-scale computing easier for developers.

Amazon EC2's simple web service interface allows you to obtain and configure capacity with minimal friction. It provides you with complete control of your computing resources and lets you run on Amazon's proven computing environment. Amazon EC2 reduces the time required to obtain and boot new server instances to minutes, allowing you to quickly scale capacity, both up and down, as your computing requirements change. Amazon EC2 changes the economics of computing by allowing you to pay only for capacity that you actually use.

Amazon EC2 enables you to increase or decrease capacity within minutes, not hours or days. You can commission one, hundreds or even thousands of server instances simultaneously. Of

course, because this is all controlled with web service APIs, your application can automatically scale itself up and down depending on its needs.

You have complete control of your instances. You have root access to each one, and you can interact with them as you would any machine. You can stop your instance while retaining the data on your boot partition and then subsequently restart the same instance using web service APIs. Instances can be rebooted remotely using web service APIs. You also have access to console output of your instances.

You have the choice of multiple instance types, operating systems, and software packages. Amazon EC2 allows you to select a configuration of memory, CPU, instance storage, and the boot partition size that is optimal for your choice of operating system and application. For example, your choice of operating systems includes numerous Linux distributions, and Microsoft Windows Server.

Amazon EC2 works in conjunction with Amazon Simple Storage Service (Amazon S3), Amazon Relational Database Service (Amazon RDS), Amazon SimpleDB and Amazon Simple Queue Service (Amazon SQS) to provide a complete solution for computing, query processing and storage across a wide range of applications.

Amazon EC2 offers a highly reliable environment where replacement instances can be rapidly and predictably commissioned. The service runs within Amazon's proven network infrastructure and datacenters. The Amazon EC2 Service Level Agreement commitment is 99.95% availability for each Amazon EC2 Region.

Amazon EC2 works in conjunction with Amazon Virtual Private Cloud (VPC) to provide security and robust networking functionality for your compute resources.

Amazon EC2 passes on to you the financial benefits of Amazon's scale. You pay a very low rate for the compute capacity you actually consume.

This lab guide explains basic concepts of AWS in a step by step fashion. However, it can only give a brief overview of Amazon EC2 concepts. For further information, please refer to the official Amazon Web Services Documentation for Amazon EC2 at:

<https://aws.amazon.com/documentation/ec2/>

Login to the AWS Management Console

Using qwikLABS to login to the AWS Management Console

Welcome to this self-paced lab! The first step is for you to login to Amazon Web Services.

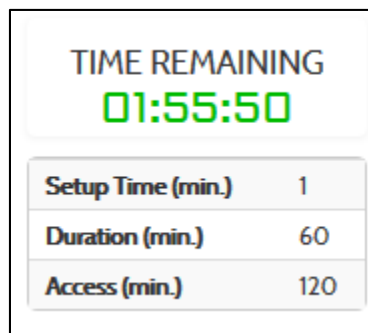
1. To the right of the lab title, click the **Start Lab** button to launch your qwikLABS. If you are prompted for a token, use the one distributed to you (or the token you purchased).



Note: A status bar shows the progress of the lab environment creation process. The AWS Management Console is accessible during lab resource creation, but your AWS resources may not be fully available until the process is complete.



2. On the lab details page, notice the lab properties.
 - a. **Setup Time** - The estimated time to set up the lab environment.
 - b. **Duration** - The time the lab will run before automatically shutting down.



3. In the AWS Management Console section of the qwikLABS page, copy the **Password** to the clipboard.



AWS Management Console

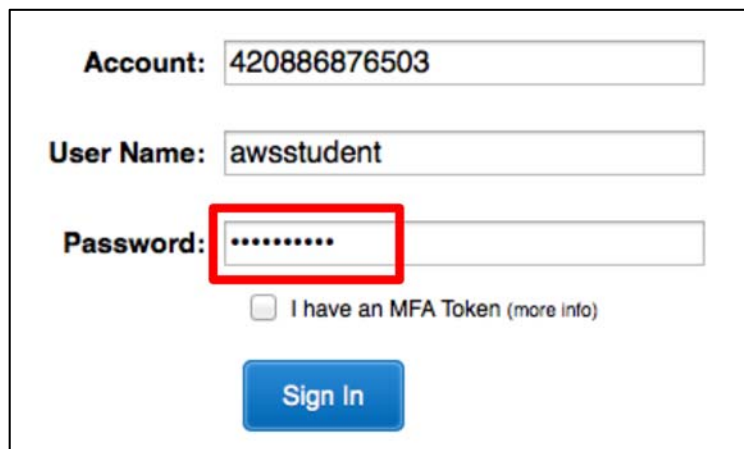
User Name:

Password:

4. Click the **Open Console** button:



5. Log into the AWS Management Console using the following steps.
 - a. In the **User Name** field type **awsstudent**.
 - b. In the **Password** field, paste the password copied from the lab details page.
 - c. Click **Sign in**.



Account:

User Name:

Password:

☐ I have an MFA Token (more info)

Note: The AWS account is automatically generated by qwikLABS. Also, the login credentials for the **awsstudent** account are provisioned by qwikLABS using AWS Identity Access Management.

Verify Your Region in the AWS Management Console

You are now logged into the Management Console. Before proceeding, we need to verify the AWS region in which we are going to create our server.

Amazon EC2 provides the ability to place instances in multiple locations. Amazon EC2 locations are composed of Availability Zones and Regions. Regions are dispersed and located in separate geographic areas (US, EU, etc.). Availability Zones are distinct locations within a Region that are engineered to be isolated from failures in other Availability Zones and provide inexpensive, low latency network connectivity to other Availability Zones in the same Region.

By launching instances in separate Regions, you can design your application to be closer to specific customers or to meet legal or other requirements. By launching instances in separate Availability Zones, you can protect your applications from localized regional failures.

6. From the home page of Management Console, select **EC2** from the left hand navigation bar.
7. Look in the upper right corner of the Management Console and make a note of the AWS Region Name that your lab is configured for. The AWS Region was set for your lab on the qwikLAB launch page.
8. Use the chart below to determine the **Region Code**. You will normally use the code (ie. us-west-2) instead of the Region Name (i.e. "US West (Oregon) Region") whenever your labs ask you to specify your region.

Region Name	Region Code
US East (Northern Virginia) Region	us-east-1
US West (Northern California) Region	us-west-1
US West (Oregon) Region	us-west-2
Asia Pacific (Tokyo) Region	ap-northeast-1
Asia Pacific (Singapore) Region	ap-southeast-1
Asia Pacific (Sydney) Region	ap-southeast-2
EU (Ireland) Region	eu-west-1
South America (Sao Paulo) Region	sa-east-1

More on Regions can be found here:

<http://docs.aws.amazon.com/general/latest/gr/rande.html>.

Using the Commands and Scripts in this Lab

IMPORTANT NOTE

If you want to copy and paste ANY code or scripts from this lab guide into an SSH session instead of manually typing them in, please make sure that you first copy and paste it to a text file and THEN copy and paste into the SSH session.

Copying text from Word documents or PDF file frequently introduces line breaks or extra (sometimes hidden) characters when you paste into SSH. We've seen more labs fail because student pasted directly from PDF into their SSH session and the commands didn't execute properly. Please use your text editor for all code and script copy and paste operations.

While we encourage students to type many of the commands themselves to help encourage learning of the core concepts, for many labs, you may find a .txt document containing the commands required for the labs on one of the "Instructions" tabs on the QwikLab lab overview page. This text file is intended to you by listed commands required for the lab so you can easily copy and paste the commands into the appropriate places during the lab. If you choose to use this text file, please download it to your computer, open it in a text editor, and read the instructions located at the beginning of the text file.

Create a New Amazon EC2 Server Instance

In this example we will launch a default Windows Server 2012 Base Instance and bootstrap (auto-install) IIS 8.0 using PowerShell script on initialization.

Application Machine Images (AMIs) and Instances

Amazon EC2 provides templates known as *Amazon Machine Images (AMIs)* that contain a software configuration (for example, an operating system, an application server, and applications). You use these templates to launch an *instance*, which is a copy of the AMI running as a virtual server in the cloud.

You can launch different types of instances from a single AMI. An *instance type* essentially determines the hardware capabilities of the virtual host computer for your instance. Each instance type offers different compute and memory capabilities. Select an instance type based on the amount of memory and computing power that you need for the application or software that you plan to run on the instance. You can launch multiple instances from an AMI.

Your instance keeps running until you stop or terminate it, or until it fails. If an instance fails, you can launch a new one from the AMI.

Launch a Windows Instance

9. In the AWS Management Console Click **EC2** to access the EC2 Dashboard.
10. Click the **Launch Instance** button in the middle of the dashboard.
11. You first need to select an AMI. As we require a Windows Server 2012 Base instance, scroll down and find the instance named "**Microsoft Windows Server 2012 Base.**"
12. Click **Select**.

When you create an instance, AWS will ask you which instance *family* you want to use. The family you choose determines how much throughput and processing cycles are available to your instance.

13. On the **Choose an Instance Type** screen, the Micro instance type, which is the smallest and lowest-cost option, should be automatically selected.
14. Click **Next: Configure Instance Details** to go to Step 3.
15. On the **Configure Instance Details** screen, scroll down and expand the **Advanced Details** section.
16. In the **Configure Instance Details** page, scroll down if required and expand the **Advanced Details** section.
17. Create a new text document with a text editor like NotePad.

IMPORTANT: As mentioned earlier, we highly recommend that you either type command from this lab into your SSH session by hand, or copy and paste them to a text file before copying and pasting them into your SSH session. Copying from Word documents or PDF files occasionally creates unwanted line breaks or inserts extra characters that will cause your lab to fail.

18. Copy & paste the following initialization script (you may need to type this into a text editor and copy & paste the results) into your text document.

```
<powershell>Install-WindowsFeature Web-Server -IncludeManagementTools -
IncludeAllSubFeature</powershell>
```

19. Copy the script from your text file.
20. Return to the AWS Management Console screen and paste the script into the **User Data** field. This script will automatically install and start Web Server features on launch.
21. Click **Next: Add Storage**.
22. Accept the default settings and click **Next: Tag Instance**.

23. Next, type a “friendly name” for your instance into the **Value** field. This name, more correctly known as a tag, will appear in the console once the instance launches. It makes it easy to keep track of running machines in a complex environment. We named ours “**Self-Paced_Lab_1**”.

24. Click **Next: Security Group**.

25. In the **Configure Security Group** page, ensure that **Create a new Security Group** radio button is selected.

26. Provide a name for your Security Group (i.e. **Self-Paced_Lab_1**).

27. The RDP port should already appear with a port of 3389.

28. Click **Add Rule**.

29. From the drop down list, choose **HTTP**. This should default to port 80.

30. Click **Add Rule**.

31. From the drop down list, choose **HTTPS**. This should default to port 443.

32. Click **Review and Launch**.

Note: You may see a warning on this screen that “Your security group ... is open to the world.” This is a result of not restricting SSH access to our machine, as described above. For the purposes of this lab only, you may ignore this warning.

33. Review your choices, and then click **Launch**.

34. You will receive a popup window to select a key pair or create a new one.

35. Check the acknowledgment box, and click **Launch Instances**.

36. Next you will see a status page, notifying you that your instances are launching. Click the **View Instances** button to continue.

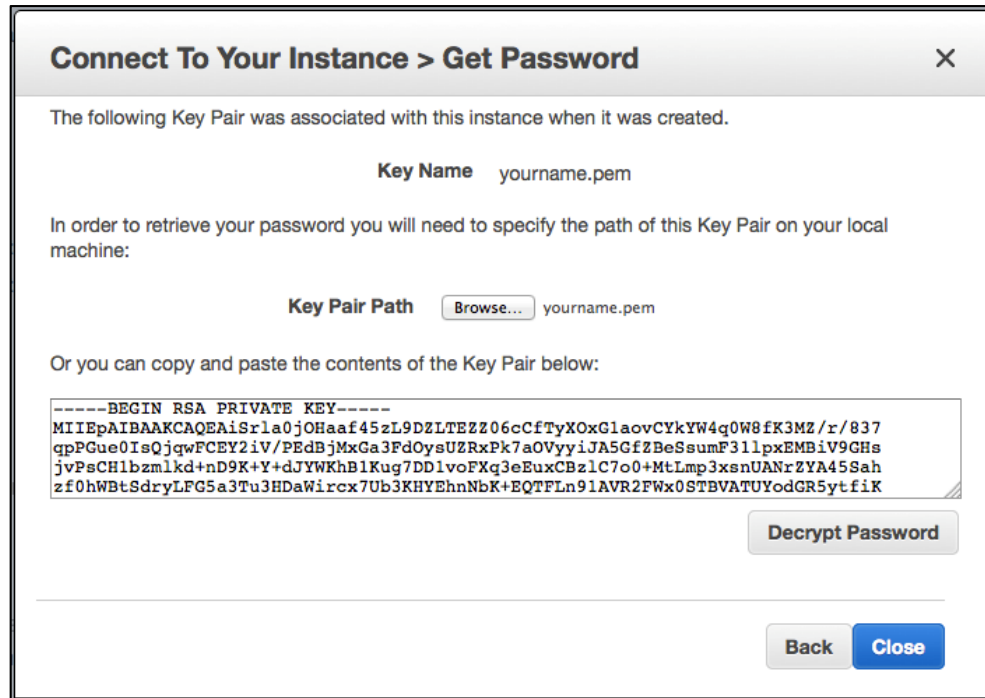
You will now be taken to the Instances tab of the Amazon EC2 Dashboard, which displays the list of all running Amazon EC2 instances in the currently selected region. You can see the status of your instance here.

Note: You may click on the newly generated unique Instance ID on the Launch Status page to monitor the progress. You can click refresh in the event the instance’s status is not updated in the console.

37. Once your instance is up and running, select the small square to the left of your instance. You should see a list of details and status update for your instance in the bottom pane of the console.

38. Select the newly launched instance and click the **Connect** button.

39. On the **Connect to Your Instance** window, click **Get Password** button.
40. Once your password is successfully created, you will see a screen similar to the one below.



41. Click **Browse**.
42. **Select the PEM Key Pair** that your downloaded earlier. The PEM file name should match the Key Name value displayed here.
43. Click **Decrypt Password**. This will display the Administrator password.
44. Make note of the password.
45. Click the **Download Remote Desktop File** button.
46. Save the RDP file to your computer.
47. Click **Close**.

Use Remote Desktop Connection to launch the downloaded RDP file and connect using the Administrator account and the password noted earlier. Remote Desktop Connection should be already installed on most recent versions of the Windows Operating System. If you are on a Mac and do not have Remote Desktop Connection installed, you can download and install it from one of the links below:

- a. Remote Desktop Connection Client for Mac - <http://www.microsoft.com/mac/remote-desktop-client>
- b. CoRD for Mac - <http://cord.sourceforge.net/>

48. Open the RDP file that you downloaded. This should automatically launch the session.

If you receive any security prompts, click Connect or Accept.

49. When prompted, enter the password that you decrypted.

50. If you are prompted with a security warning, allow the connection.

Configure the Windows Instance

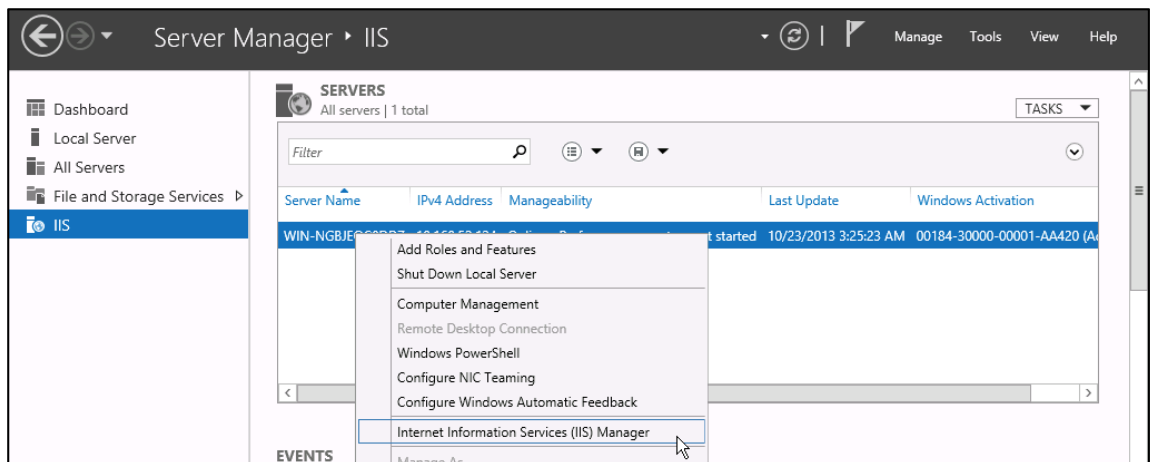
The AMI has already been customized with the installation of IIS from the PowerShell script you entered as User Data when the instance was launched.

Once the session is fully up and running, modify the web server by adding the following index file.

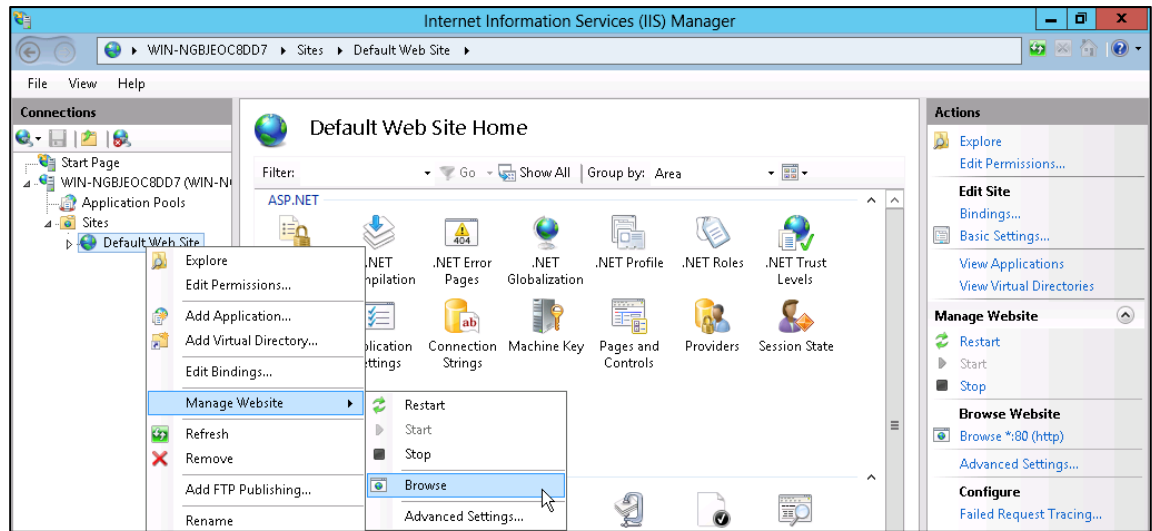
51. Launch Server Manager from the taskbar. Note: you may need to expand your session window to see the taskbar.



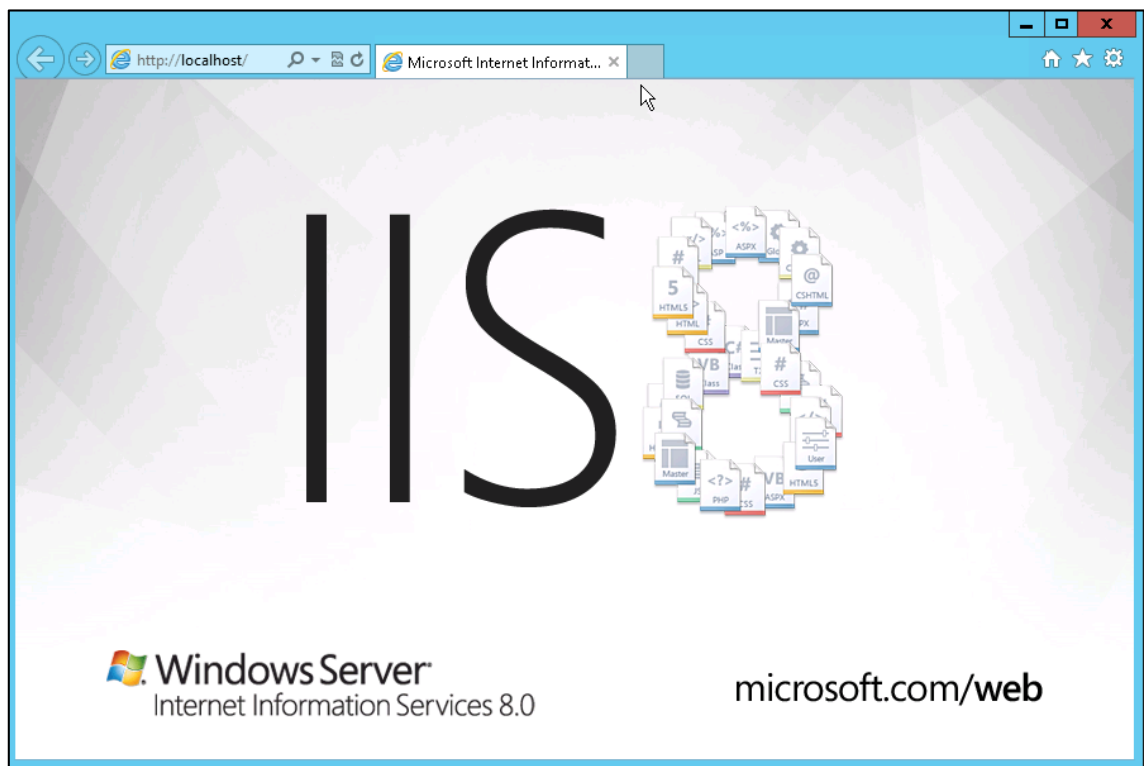
52. Launch Internet Information Services (IIS) Manager by navigating as shown below. If you don't see IIS listed in the left column, click the circular "refresh" icon on the top toolbar.



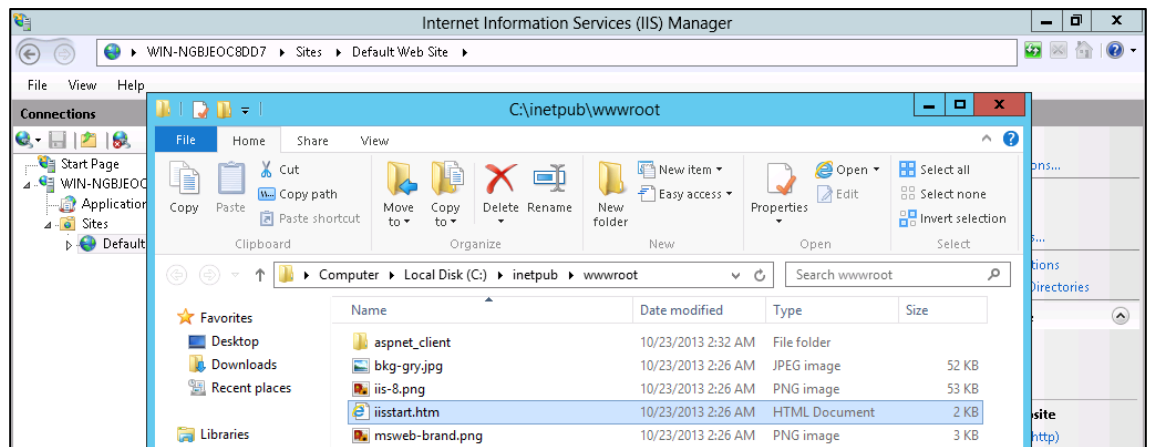
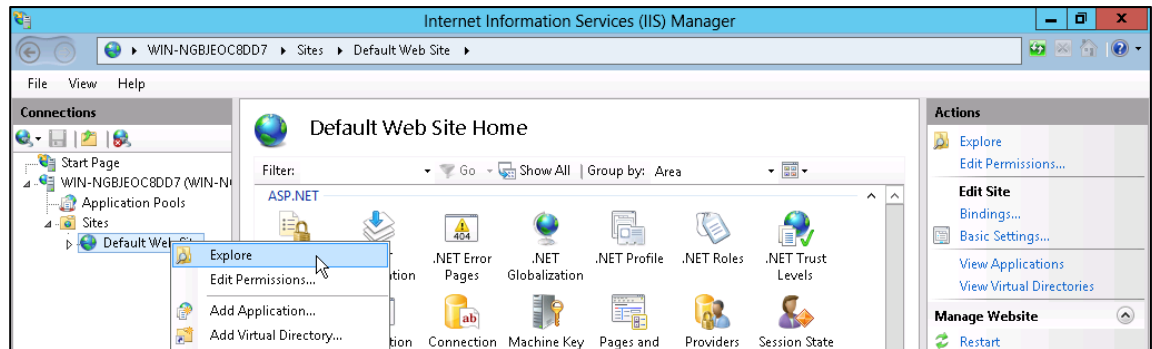
53. Browse the Default Web Site by navigating as shown below.



54. The browser launches and connects to the Default Web Site.

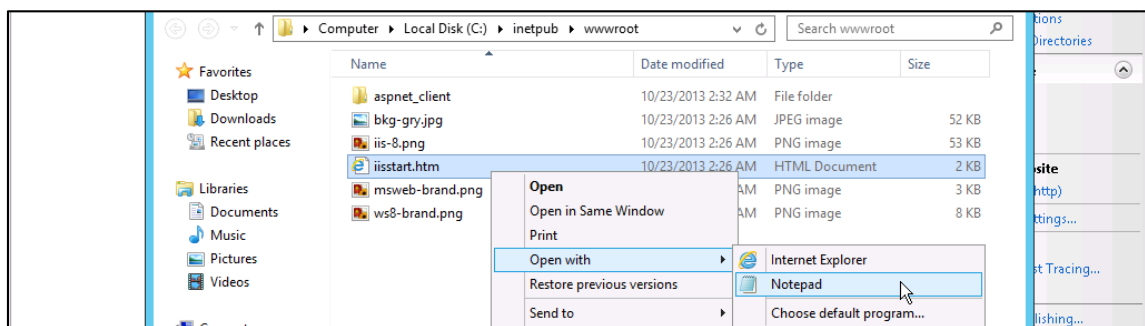


55. Close the browser. From the IIS Manager, open the directory where the web assets are stored (C:\inetpub\wwwroot). You may navigate as shown below.

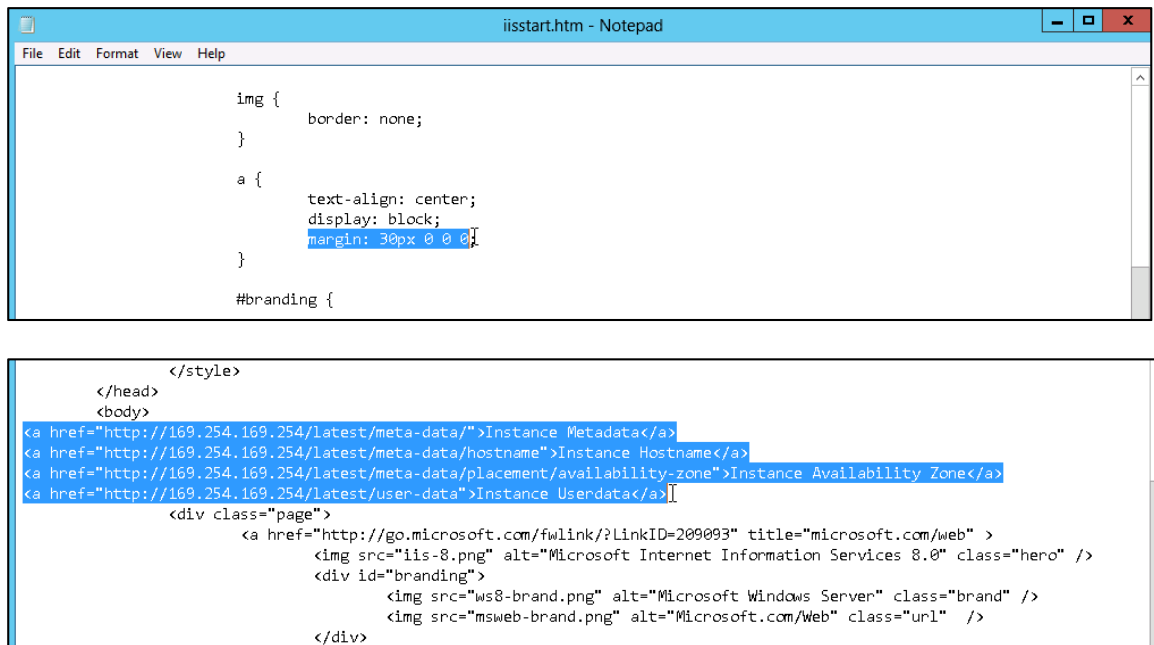


56. Edit the iisstart.htm using a notepad and paste the following text in the body section and change margin settings as shown below.

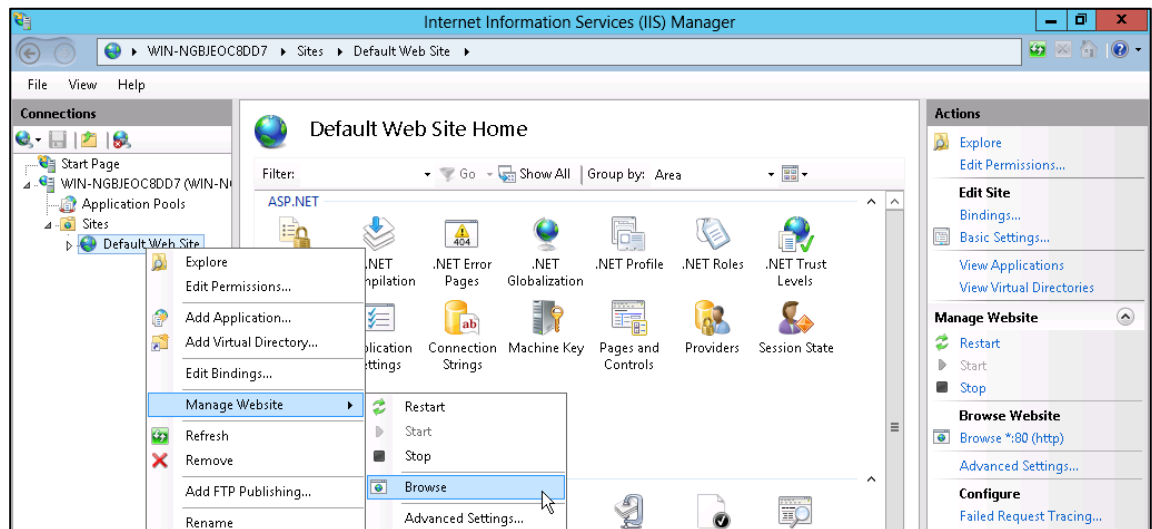
```
<a href="http://169.254.169.254/latest/meta-data/">Instance Metadata</a>
<a href="http://169.254.169.254/latest/meta-data/hostname">Instance
Hostname</a>
<a href="http://169.254.169.254/latest/meta-data/placement/availability-
zone">Instance Availability Zone</a>
<a href="http://169.254.169.254/latest/user-data">Instance Userdata</a>
```



57. Change the margin from 100px to 30px.



58. Save and close the text file. Browse the Default Web Site by navigating as shown below.

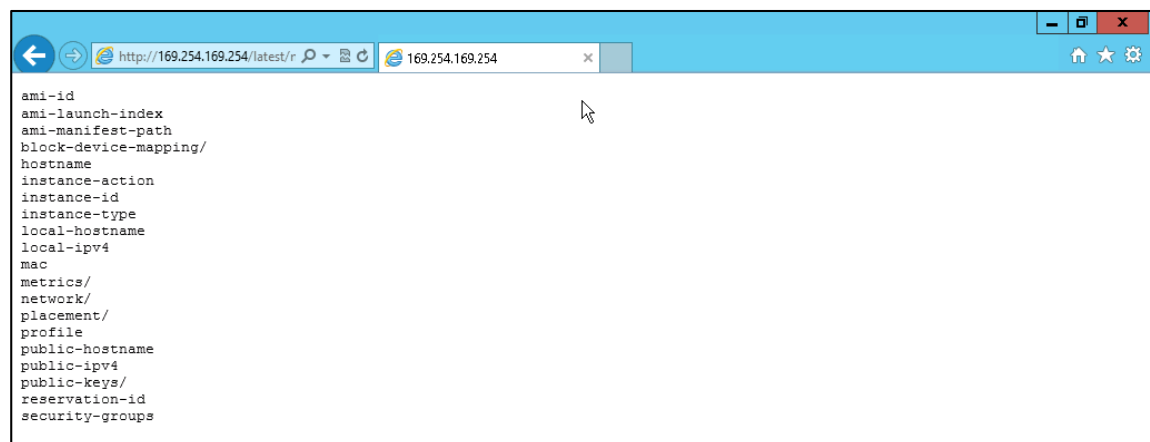


The browser launches and connects to the Default Web Site.

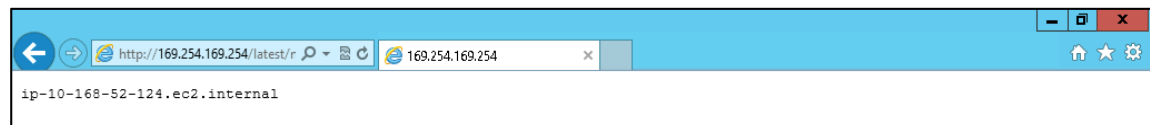


59. Click on the URLs to view instance metadata and User Data that was passed during launch.

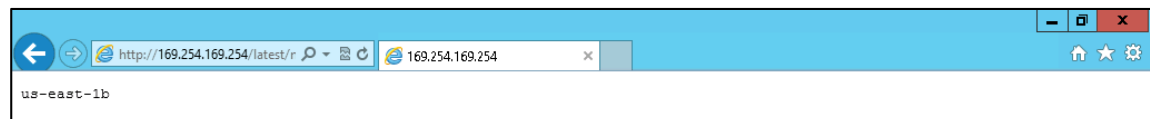
Instance Metadata



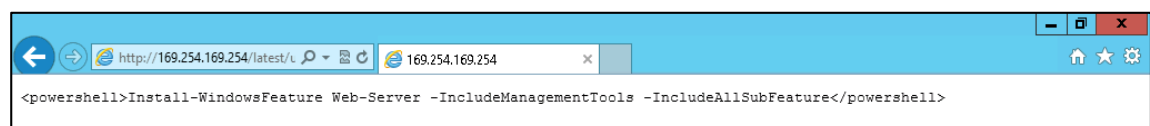
Instance Hostname (the result will vary)



Instance Availability Zone (the result will vary based on the region and availability zone used)



Instance User Data



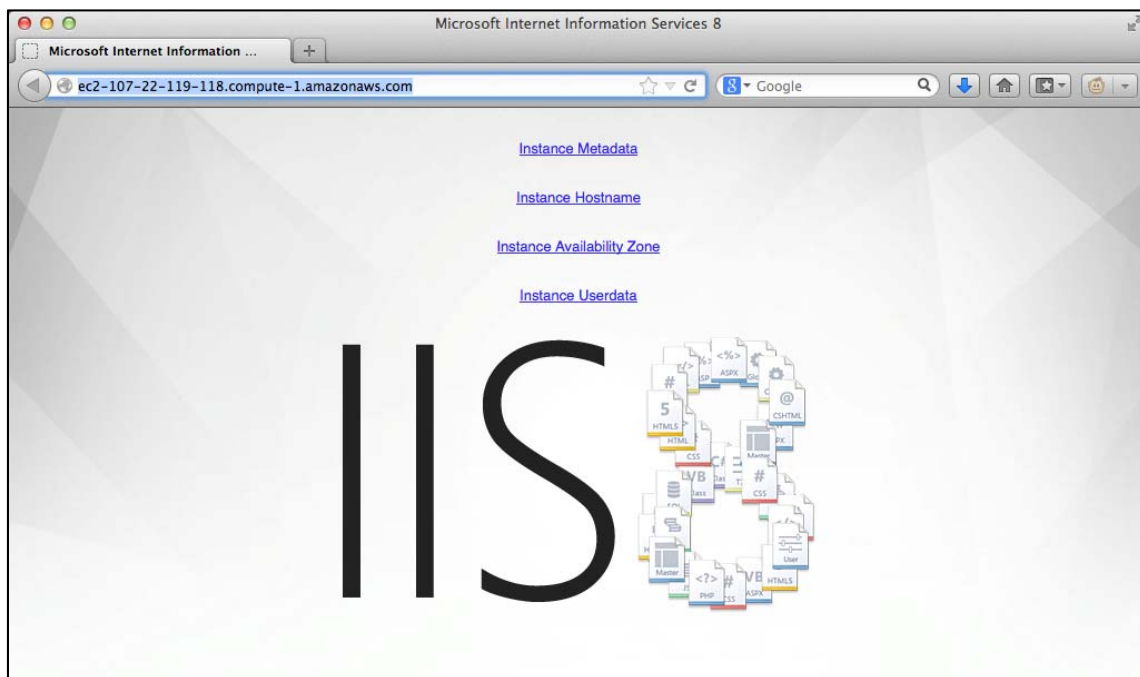
60. Close the remote desktop session.

Connect to the web server

61. Find the DNS name of your instance from the EC2 Console. It will look similar to **ec2-54-186-200-130.us-west-2.compute.amazonaws.com**.

62. Enter the DNS name of your instance into your browser and connect to the server.

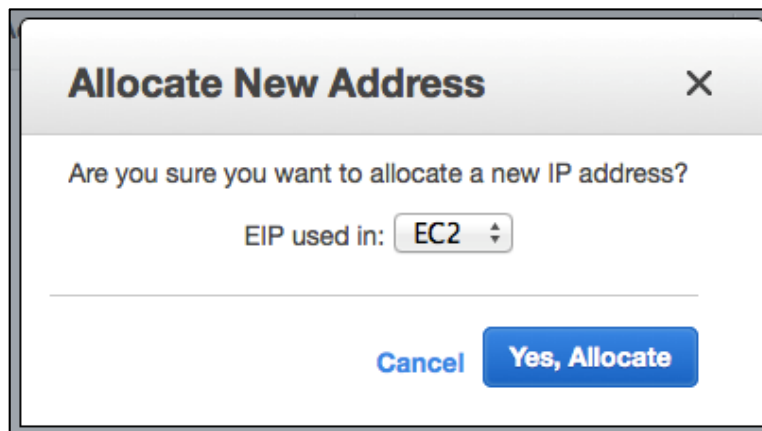
If successful, you will see your Default Web Site appear:



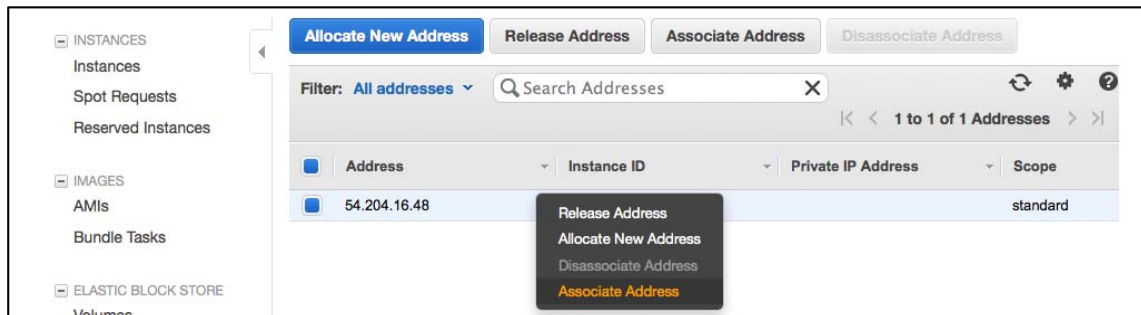
Assign a Fixed IP Address

AWS offers Elastic IP Addresses (EIPs), which are actually NAT addresses that operate at a regional level. That is, an Elastic IP Address works across Availability Zones, within a single region. Let's assign an EIP to your instance.

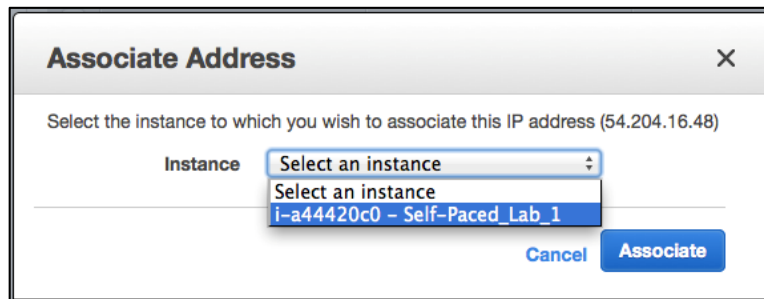
63. Click on the **Elastic IPs** link in the EC2 Console.
64. Click on **Allocate New Address**.
65. You'll see a confirmation prompt. Click **Yes, Allocate**



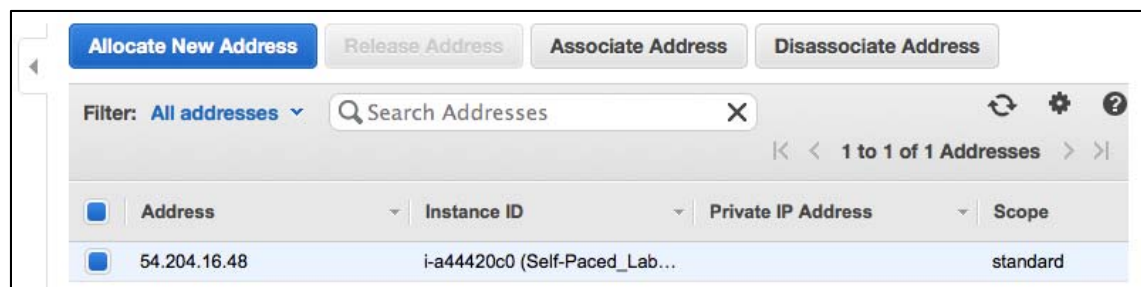
66. After confirmation, you'll see your newly allocated EIP. Right-click on it and choose **Associate Address** from the pop-up menu.



67. A popup will allow you to associate the EIP with one of your running instances. Choose the instance that you just launched and click **Associate**. (the instance id may vary).



Now your Elastic IP address is associated to your instance.



Your instance should now report its new IP address in the console:

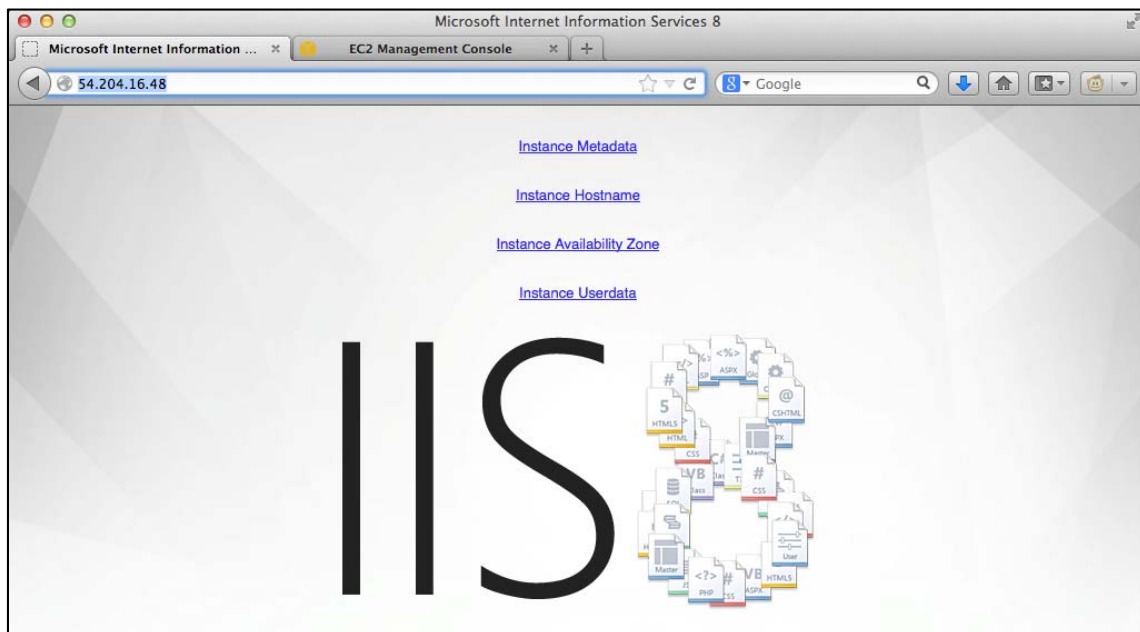
Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks
Self-Paced_...	i-a44420c0	t1.micro	us-east-1b	running	2/2 checks..

Instance: i-a44420c0	Elastic IP: 54.204.16.48	
----------------------	--------------------------	--

Description	Status Checks	Monitoring	Tags
-------------	---------------	------------	------

Instance ID	i-a44420c0	Public DNS	ec2-54-204-16-48.c 1.amazonaws.com
Instance state	running	Elastic IP	54.204.16.48

68. Enter the new IP address of your web server in a browser. If successful, you will see your Default Web Site appear:



Conclusion

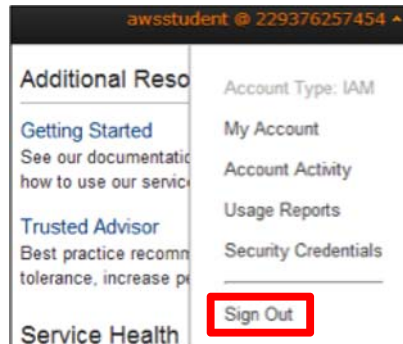
Congratulations! You now have successfully:

- Learned about the basic concepts and terminology of the Amazon Elastic Compute Cloud (EC2) service.
- Created your own Amazon EC2 server instance running Windows in the AWS cloud.
- Modified it to run a web server with a page that displays machine-specific information.
- Assigned a fixed public IP address (Elastic IP) to your instance.

End Your Lab

69. Return to the AWS Management Console.

70. From the menu on the upper right of the screen, click **awsstudent @ [YourAccountNumber]** and choose **Sign out** (where [YourAccountNumber] is the AWS account generated by qwikLABS):



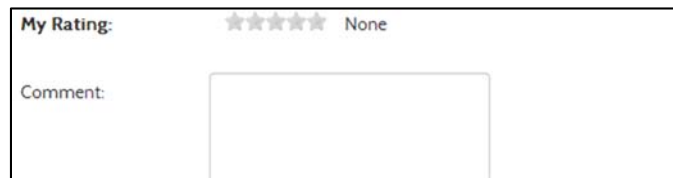
71. Close any active SSH client sessions or remote desktop sessions.

72. Click the **End Lab** button on the qwikLABS lab details page.



73. When prompted for confirmation, click **OK**.

74. For **My Rating**, rate the lab (using the applicable number of stars), optionally type a **Comment**, and click **Submit**.



Note: The number of stars indicates the following:

- 1 star = Very dissatisfied
- 2 stars = Dissatisfied
- 3 stars = Neutral
- 4 stars = Satisfied
- 5 stars = Very satisfied.

You may close the dialog if you do not wish to provide feedback.

What Should I Do Next?

The following labs will help you understand how to leverage other features of AWS that add additional functionality to your AWS implementation.

To learn how to:

- Create and attach additional storage to your Amazon EC2 instance:
 - Amazon Elastic Block Store (EBS)
<https://run.qwiklabs.com/focuses/preview/949>
- Use AWS Elastic Load Balancer (ELB) to balance Web traffic between two or more instances:
 - Elastic Load Balancing (ELB)
<https://run.qwiklabs.com/focuses/preview/950>
- Create a new server instance by bidding on instance pricing:
 - Launching Amazon EC2 Spot Instances
<https://run.qwiklabs.com/focuses/preview/955>
- Add a relational database to your Virtual Private Cloud:
 - Using Amazon RDS for Applications
<https://run.qwiklabs.com/focuses/preview/1002>

Additional Resources

- For more information about Amazon Training and Certification, visit
<http://aws.amazon.com/training/>

For feedback, suggestions, or corrections, please email: aws-course-feedback@amazon.com