



## *Getting Started with Linux on Amazon EC2*

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**July 2018**

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## Overview

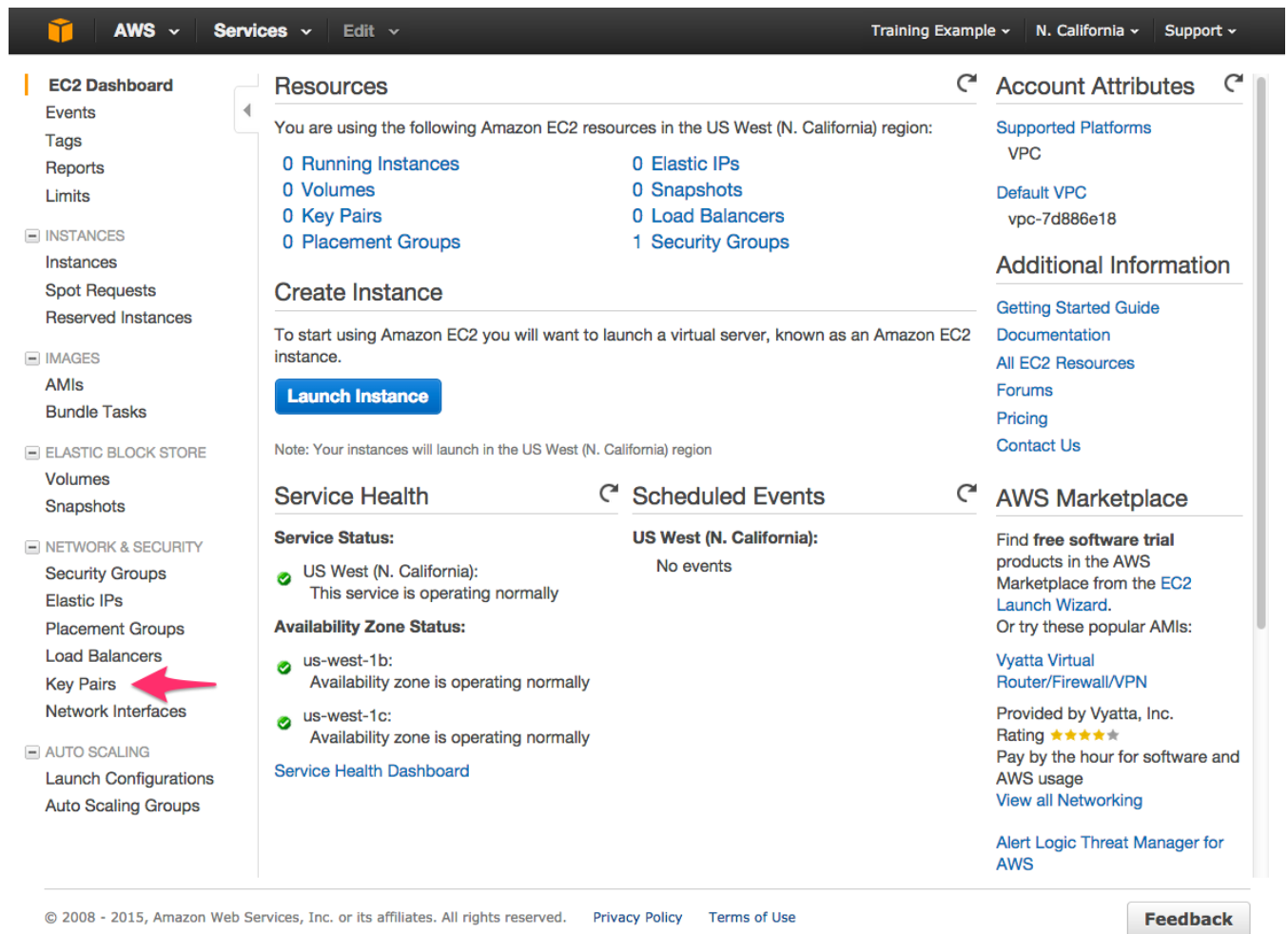
Amazon Elastic Compute Cloud (Amazon EC2) is a web service that provides resizable compute capacity in the cloud. Amazon EC2's simple web service interface allows you to obtain and configure capacity with minimal friction. Amazon EC2 reduces the time required to obtain and boot new server instances to 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.

This lab will walk you through launching, configuring, and customizing an EC2 virtual machine to run a web server. It will walk you through successfully provisioning and starting an EC2 instance using the AWS Management Console.

## Create a new Key Pair

In this lab, you will need to create an EC2 instance using an SSH keypair. The following steps outline creating a unique SSH keypair for you to use in this lab.

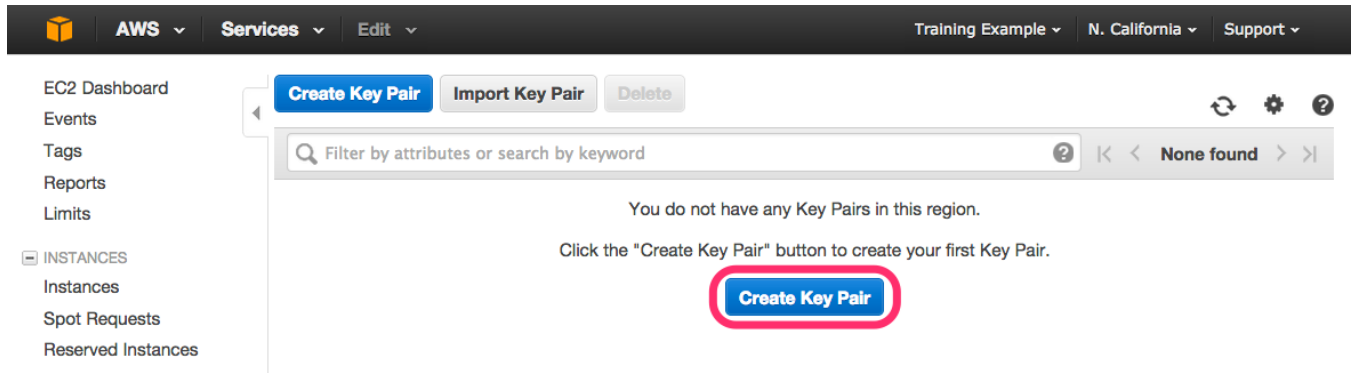
1. Sign into the AWS Management Console and open the Amazon EC2 console at <https://console.aws.amazon.com/ec2>.
2. In the upper-right corner of the AWS Management Console, confirm you are in the desired AWS region (e.g., Oregon).
3. Click on **Key Pairs** in the NETWORK & SECURITY section near the bottom of the leftmost menu. This will display a page to manage your SSH key pairs.



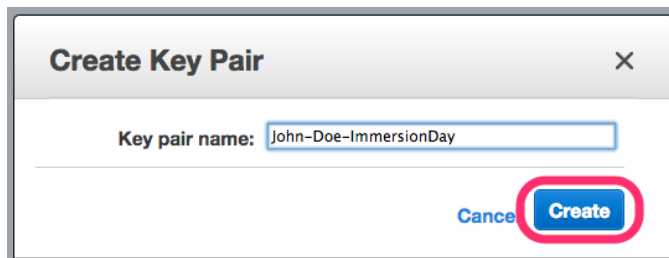
The screenshot shows the AWS Management Console interface. The top navigation bar includes the AWS logo, 'AWS' dropdown, 'Services' dropdown, 'Edit' dropdown, 'Training Example' dropdown, 'N. California' dropdown, and 'Support' dropdown. The left-hand navigation menu is expanded, showing sections like EC2 Dashboard, INSTANCES, IMAGES, ELASTIC BLOCK STORE, NETWORK & SECURITY, and AUTO SCALING. A red arrow points to 'Key Pairs' under the NETWORK & SECURITY section. The main content area displays 'Resources' for the US West (N. California) region, including counts for Running Instances, Volumes, Key Pairs, Placement Groups, Elastic IPs, Snapshots, Load Balancers, and Security Groups. Below this is a 'Create Instance' section with a 'Launch Instance' button. The 'Service Health' section shows the status of the US West (N. California) region and its availability zones. The 'AWS Marketplace' section lists various software products available for purchase.

4. To create a new SSH key pair, click the **Create Key Pair** button at the top of the browser window.

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5. In the resulting pop up window, type *[First Name]-[Last Name]-ImmersionDay* into the **Key Pair Name:** text box and click **Create**.



6. The page will download the file "*[Your-Name]-ImmersionDay.pem*" to the local drive. Follow the browser instructions to save the file to the default download location.
7. Remember the full path to the file .pem file you just downloaded.



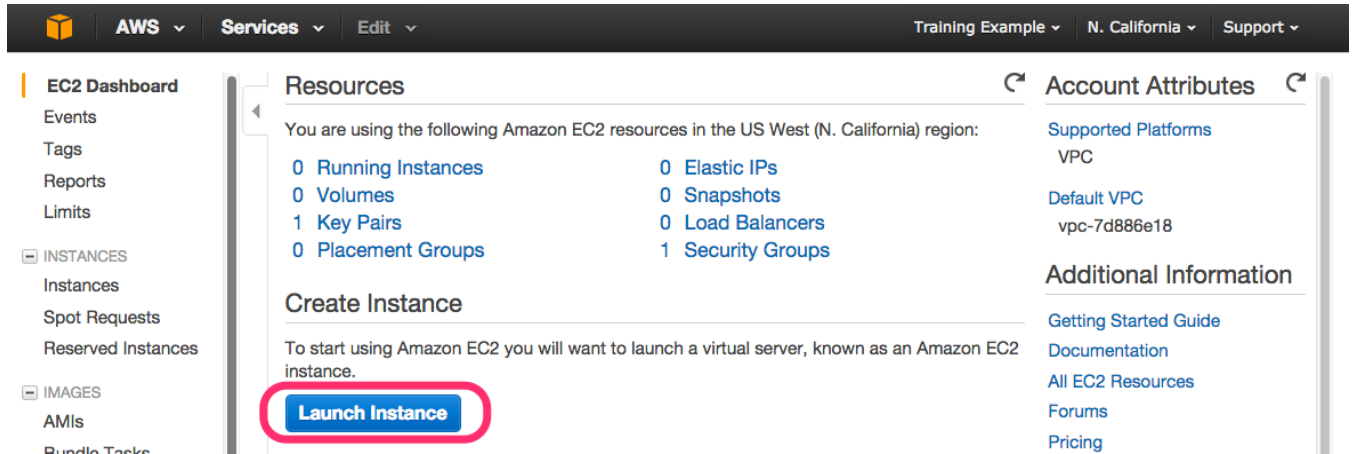
You will use the Key Pair you just created to manage your EC2 instances for the rest of the lab.

## Launch a Web Server Instance

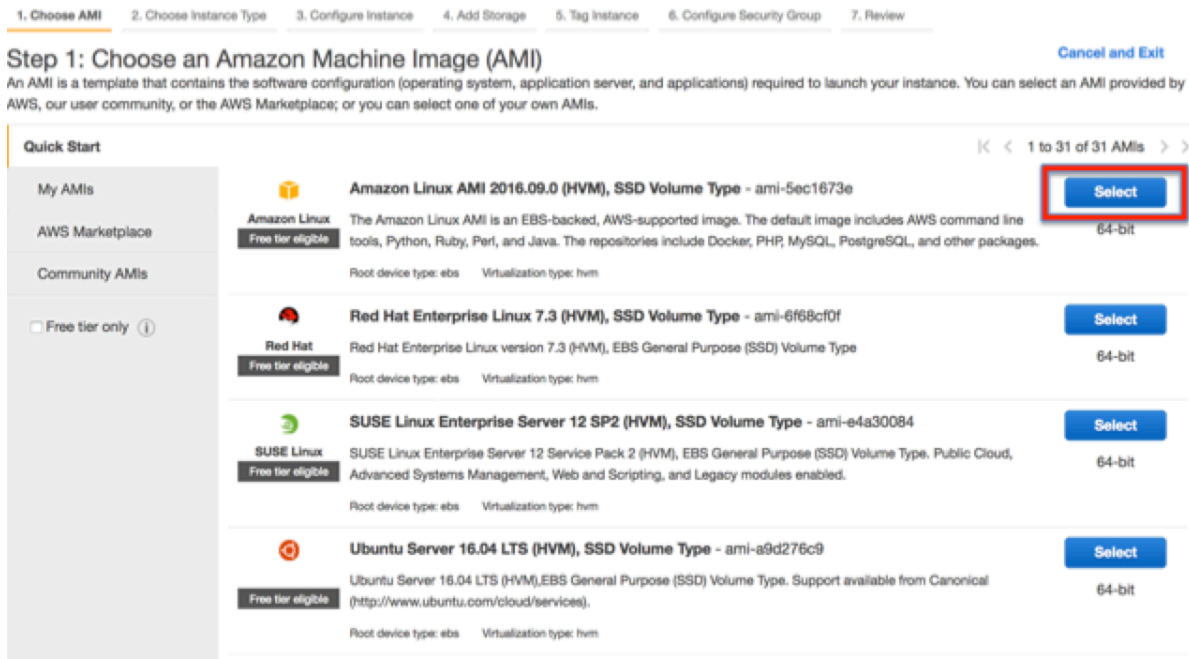
In this example we will launch a default Amazon Linux Instance with an Apache/PHP web server installed on initialization.

8. Click **EC2 Dashboard** towards the top of the left menu.

9. Click on **Launch Instance**




10. In the **Quick Start** section, select the first Amazon Linux AMI and click **Select**



11. Select the General purpose t2.micro instance type and click **Next: Configure Instance Details**

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 **AWS** ▾ **Services** ▾ Edit ▾ Training Example ▾ N. California ▾ Support ▾

1. Choose AMI 2. Choose Instance Type 3. Configure Instance 4. Add Storage 5. Tag Instance 6. Configure Security Group 7. Review

### Step 2: Choose an Instance Type

Amazon EC2 provides a wide selection of instance types optimized to fit different use cases. Instances are virtual servers that can run applications. They have varying combinations of CPU, memory, storage, and networking capacity, and give you the flexibility to choose the appropriate mix of resources for your applications. [Learn more](#) about instance types and how they can meet your computing needs.

Filter by: **All instance types** ▾ **Current generation** ▾ [Show/Hide Columns](#)

**Currently selected:** t2.micro (Variable ECUs, 1 vCPUs, 2.5 GHz, Intel Xeon Family, 1 GiB memory, EBS only)

	Family ▾	Type ▾	vCPUs ⓘ ▾	Memory (GiB) ▾	Instance Storage (GB) ⓘ ▾	EBS-Optimized Available ⓘ ▾	Network Performance ⓘ ▾
<input checked="" type="checkbox"/>	General purpose	t2.micro <b>Free tier eligible</b>	1	1	EBS only	-	Low to Moderate
<input type="checkbox"/>	General purpose	t2.small	1	2	EBS only	-	Low to Moderate
<input type="checkbox"/>	General purpose	t2.medium	2	4	EBS only	-	Low to Moderate
<input type="checkbox"/>	General purpose	m3.medium	1	3.75	1 x 4 (SSD)	-	Moderate
<input type="checkbox"/>	General purpose	m3.large	2	7.5	1 x 32 (SSD)	-	Moderate
<input type="checkbox"/>	General purpose	m3.xlarge	4	15	2 x 40 (SSD)	Yes	High
<input type="checkbox"/>	General purpose	m3.2xlarge	8	30	2 x 80 (SSD)	Yes	High


[Cancel](#) [Previous](#) [Review and Launch](#) **Next: Configure Instance Details**

12. On the **Configure Instance Details** page, expand the **Advanced Details** section at the bottom of the page, and type the following initialization script information (*you can use Shift-Enter to create the necessary line break, or alternatively you could type this into Notepad and copy & paste the results*) into the User Data field (this will automatically install and start the Apache web server on launch) and click **Next: Add Storage**:

**#include**

**<https://s3.amazonaws.com/immersionday-labs/bootstrap.sh>**

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AWS

Services

Edit

Training Example

N. California

Support

1. Choose AMI2. Choose Instance Type3. Configure Instance4. Add Storage5. Tag Instance6. Configure Security Group7. Review

### Step 3: Configure Instance Details

Network

vpc-7d886e18 (172.31.0.0/16) (default)

Create new VPC

Subnet

No preference (default subnet in any Availabilit

Create new subnet

Auto-assign Public IP

Use subnet setting (Enable)

IAM role

None

Shutdown behavior

Stop

Enable termination protection

☐ Protect against accidental termination

Monitoring

☐ Enable CloudWatch detailed monitoring

Additional charges apply.

Tenancy

Shared tenancy (multi-tenant hardware)

Additional charges will apply for dedicated tenancy.

Advanced Details

User data

☒ As text ☐ As file ☐ Input is already base64 encoded

#include  
https://awstechbootcamp.s3.amazonaws.com/bootstrap.sh

CancelPreviousReview and LaunchNext: Add Storage

13. Click **Next: Tag Instance** to accept the default Storage Device Configuration.



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The screenshot shows the 'Add Storage' step in the AWS Management Console. At the top, there's a navigation bar with 'AWS', 'Services', and 'Edit'. Below it, a progress bar shows steps 1 through 7, with '4. Add Storage' highlighted. The main heading is 'Step 4: Add Storage', followed by a paragraph explaining storage options. Below this is a table with columns: Type, Device, Snapshot, Size (GiB), Volume Type, IOPS, Delete on Termination, and Encrypted. The first row shows the 'Root' volume with device '/dev/xvda', snapshot 'snap-14cff4d5', size '8', volume type 'General Purpose', IOPS '24 / 3000', 'Delete on Termination' checked, and 'Not Encrypted'. There's an 'Add New Volume' button. A blue box contains a message about free tier eligibility. At the bottom right, navigation buttons include 'Cancel', 'Previous', 'Review and Launch', and 'Next: Tag Instance' (which is highlighted with a red circle).

Type	Device	Snapshot	Size (GiB)	Volume Type	IOPS	Delete on Termination	Encrypted
Root	/dev/xvda	snap-14cff4d5	8	General Purpose	24 / 3000	<input checked="" type="checkbox"/>	Not Encrypted

[Learn more](#) about free usage tier eligibility and usage restrictions.

[Next: Tag Instance](#)

Next, choose a “friendly name” for your instance. 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. Name yours according to this format: “[Your Name] Web Server.”

Then click **Next: Configure Security Group**.

### Step 5: Tag Instance

A tag consists of a case-sensitive key-value pair. For example, you could define a tag with key = Name and value = Webserver. [Learn more](#) about tagging your Amazon EC2 resources.

The screenshot shows the 'Tag Instance' step. It has two input fields: 'Key' (127 characters maximum) and 'Value' (255 characters maximum). The 'Key' field contains 'Name' and the 'Value' field contains 'John Doe Web Server' (highlighted with a red circle). Below these fields is a 'Create Tag' button and a note '(Up to 10 tags maximum)'. At the bottom right, navigation buttons include 'Cancel', 'Previous', 'Review and Launch', and 'Next: Configure Security Group' (highlighted with a red circle).

Key	Value
Name	John Doe Web Server

[Next: Configure Security Group](#)

14. You will be prompted to create a new security group, which will be your firewall rules. On the assumption that we are building out a Web server, name your new security group “[Your Name] Web Tier”, and confirm an existing SSH rule exists which allows TCP port 22

from anywhere. Click **Add Rule.**

15. Select HTTP from the Type dropdown menu, and confirm TCP port 80 is allowed form anywhere. Click **Add Rule.**

16. Click the **Review and Launch** button after configuring the security group.

**Step 6: Configure Security Group**

A security group is a set of firewall rules that control the traffic for your instance. On this page, you can add rules to allow specific traffic to reach your instance. For example, if you want to set up a web server and allow Internet traffic to reach your instance, add rules that allow unrestricted access to the HTTP and HTTPS ports. You can create a new security group or select from an existing one below. [Learn more](#) about Amazon EC2 security groups.

**Assign a security group:** ☒ Create a new security group ☐ Select an **existing** security group

**Security group name:** John-Doe-WebTier

**Description:** launch-wizard-1 created 2015-01-16T14:59:21.209-05:00

Type	Protocol	Port Range	Source
SSH	TCP	22	Anywhere 0.0.0.0/0
HTTP	TCP	80	Anywhere 0.0.0.0/0

**Add Rule**

**Warning**  
Rules with source of 0.0.0.0/0 allow all IP addresses to access your instance. We recommend setting security group rules to allow access from known IP addresses only.

[Cancel](#) [Previous](#) **Review and Launch**

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

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**Step 7: Review Instance Launch**

Please review your instance launch details. You can go back to edit changes for each section. Click **Launch** to assign a key pair to your instance and complete the launch process.

**Improve your instances' security. Your security group, John-Doe-WebTier, is open to the world.**

Your instances may be accessible from any IP address. We recommend that you update your security group rules to allow access from known IP addresses only. You can also open additional ports in your security group to facilitate access to the application or service you're running, e.g., HTTP (80) for web servers. [Edit security groups](#)

**AMI Details** [Edit AMI](#)

**Amazon Linux AMI 2014.09.1 (HVM) - ami-4b6f650e**

The Amazon Linux AMI is an EBS backed image. It includes the 3.14 kernel, Ruby 2.1, PHP 5.5, PostgreSQL 9.3, Docker 1.2, the AWS command line tools, and repository access to many other packages.

Root Device Type: ebs Virtualization type: hvm

**Instance Type** [Edit instance type](#)

Instance Type	ECUs	vCPUs	Memory (GiB)	Instance Storage (GB)	EBS-Optimized Available	Network Performance
t2.micro	Variable	1	1	EBS only	-	Low to Moderate

**Security Groups** [Edit security groups](#)

Security group name: John-Doe-WebTier

[Cancel](#) [Previous](#) [Launch](#)

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18. Select the *[YourName]-ImmersionDay* key pair that you created in the beginning of this lab from the drop and check the "I acknowledge" checkbox. Then click the **Launch Instances** button.

**Select an existing key pair or create a new key pair**

A key pair consists of a **public key** that AWS stores, and a **private key file** that you store. Together, they allow you to connect to your instance securely. For Windows AMIs, the private key file is required to obtain the password used to log into your instance. For Linux AMIs, the private key file allows you to securely SSH into your instance.

Note: The selected key pair will be added to the set of keys authorized for this instance. Learn more about [removing existing key pairs from a public AMI](#).

Choose an existing key pair

Select a key pair

John-Doe-ImmersionDay

☒ I acknowledge that I have access to the selected private key file (John-Doe-ImmersionDay.pem), and that without this file, I won't be able to log into my instance.

[Cancel](#) [Launch Instances](#)

19. Click the **View Instances** button in the lower righthand portion of the screen to view the list of EC2 instances. Once your instance has launched, you will see your web Server as well as the Availability Zone the instance is in and the publicly routable DNS name.

20. Click the checkbox next to your web server name to view details about this EC2 instance.

The screenshot shows the AWS Management Console interface. On the left is a navigation menu with categories like INSTANCES, IMAGES, ELASTIC BLOCK STORE, NETWORK & SECURITY, and AUTO SCALING. The main area displays a table of EC2 instances. One instance, 'John Doe Web Server', is selected and highlighted with a red circle. Below the table, the details for this instance are shown, also highlighted with a red circle. The details include the instance ID, state (running), type (t2.micro), and public DNS information.

Name	Instance ID	Instance Type	Availability Zone
John Doe Web Server	i-664070ae	t2.micro	us-west-1

Instance: i-664070ae (John Doe Web Server)		Public DNS: ec2-54-183-155-199.us-west-1.compute.amazonaws.com	
Instance ID	i-664070ae	Public DNS	ec2-54-183-155-199.us-west-1.compute.amazonaws.com
Instance state	running	Public IP	54.183.155.199
Instance type	t2.micro	Elastic IP	-
Private DNS	ip-172-31-16-33.us-west-1.compute.internal	Availability zone	us-west-1c

## Browse the Web Server

1. Wait for the instance to pass the Status Checks to finish loading.

<input type="checkbox"/>	Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks
<input type="checkbox"/>	John Doe Web Server	i-664070ae	t2.micro	us-west-1c	<span style="color: green;">●</span> running	Initializing

Finished initializing

<input type="checkbox"/>	Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks
<input type="checkbox"/>	John Doe Web Server	i-664070ae	t2.micro	us-west-1c	<span style="color: green;">●</span> running	<span style="color: green;">✔</span> 2/2 checks passed

2. Open a new browser tab and browse the Web Server by entering the EC2 instance's Public DNS name into the browser. The EC2 instance's Public DNS name can be found in the console by reviewing the "Public DNS" name line highlighted above.

You should see a website that looks like the following:



LOAD TEST

RDS

Meta-Data	Value
InstanceId	<i>i-664070ae</i>
Availability Zone	<i>us-west-1c</i>

Current CPU Load: **0%**

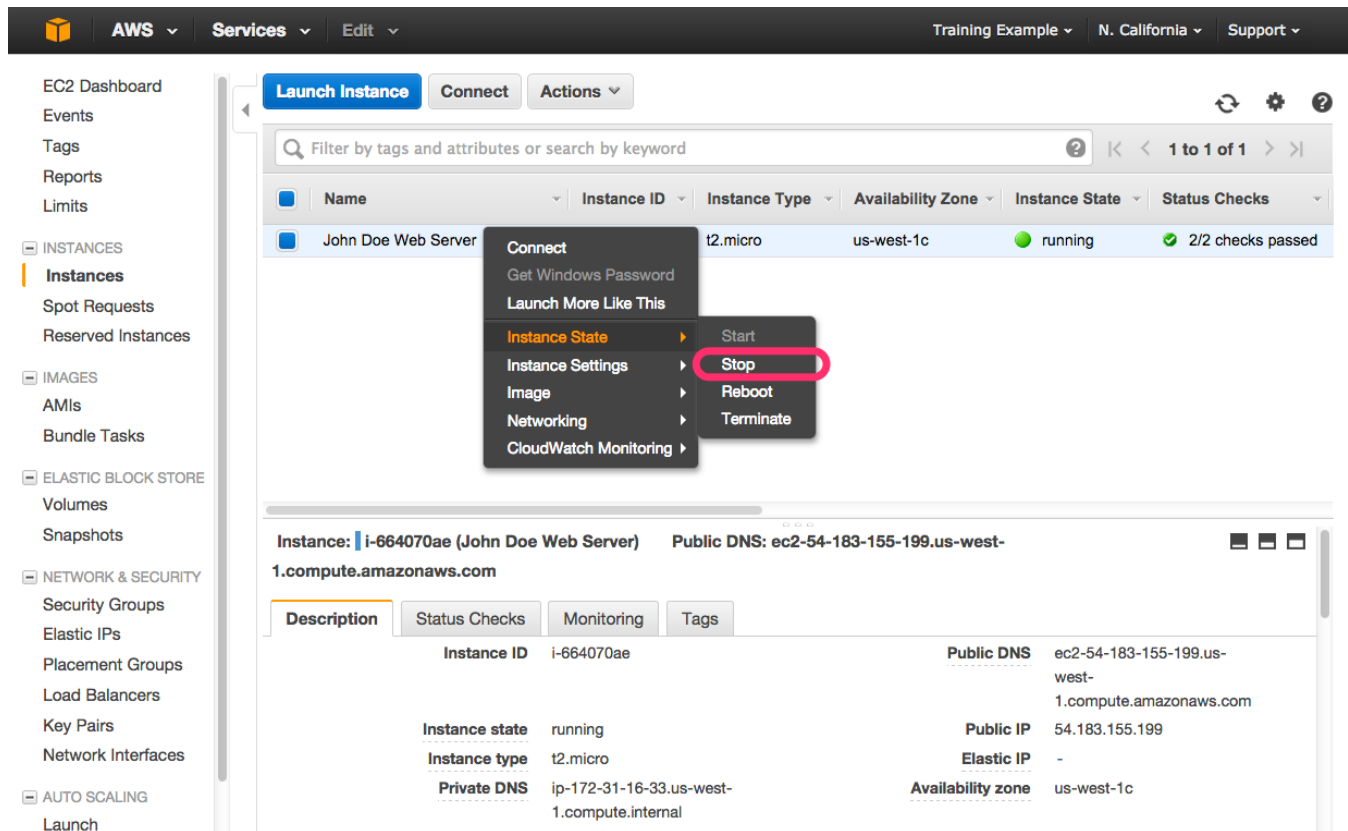
Great Job! You have deployed a server and launched a web site in a matter of minutes!!

## Appendix – Additional EC2 Concepts

### Change the Instance Type

Did you know that you can change the instance type that an AMI is running on? This only works with EBS-backed instances (what we're running here). There is no particular reason to change the instance type in this lab, but the following steps outline how easy it is to do in AWS.

In the AWS Console, select your lab instance, then right-click on it and hover over “Instance State” and select “Stop” (not “Terminate”). Confirm you would like to stop the instance by selecting “Yes, Stop”.



The screenshot shows the AWS Management Console interface. On the left is a navigation sidebar with categories like INSTANCES, IMAGES, ELASTIC BLOCK STORE, NETWORK & SECURITY, and AUTO SCALING. The main area displays a table of EC2 instances. One instance, 'John Doe Web Server' (ID: i-664070ae), is highlighted. A context menu is open over this instance, showing options like 'Connect', 'Instance State', 'Instance Settings', etc. The 'Instance State' sub-menu is open, and the 'Stop' option is circled in red. Below the table, the details for the selected instance are shown, including its ID, state (running), type (t2.micro), and DNS information.

Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks
John Doe Web Server	i-664070ae	t2.micro	us-west-1c	running	2/2 checks passed

Instance: i-664070ae (John Doe Web Server)		Public DNS: ec2-54-183-155-199.us-west-1.compute.amazonaws.com	
Instance ID	i-664070ae	Public DNS	ec2-54-183-155-199.us-west-1.compute.amazonaws.com
Instance state	running	Public IP	54.183.155.199
Instance type	t2.micro	Elastic IP	-
Private DNS	ip-172-31-16-33.us-west-1.compute.internal	Availability zone	us-west-1c

After it has stopped, right-click on it again, hover over “Instance Settings,” and select “Change Instance Type.” Select t2.small, and click Apply.

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The screenshot shows the AWS Management Console interface for the EC2 service. The top navigation bar includes the AWS logo, 'Services', 'Edit', and regional information (Training Example, N. California, Support). The left sidebar contains a navigation menu with categories like INSTANCES, IMAGES, ELASTIC BLOCK STORE, NETWORK & SECURITY, and AUTO SCALING. The main content area displays a table of EC2 instances. The instance 'John Doe Web Server' is selected, and a context menu is open, showing various actions. The 'Change Instance Type' option is highlighted with a red circle. Below the table, the instance details for 'i-664070ae (John Doe Web Server)' are shown, including its state (stopped), type (t2.micro), and various IP addresses.

Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks
John Doe Web Server	i-664070ae	t2.micro	us-west-1c	stopped	

Instance: i-664070ae (John Doe Web Server) Private IP: 172.31.16.33

Description	Status Checks	Monitoring	Tags
Instance ID	i-664070ae	Public DNS	-
Instance state	stopped	Public IP	-
Instance type	t2.micro	Elastic IP	-
Private DNS	ip-172-31-16-33.us-west-1.compute.internal	Availability zone	us-west-1c
Private IPs	172.31.16.33	Security groups	John-Doe-WebTier . view rules
Secondary private IPs		Scheduled events	-

Right-click your instance type again, and click “Start.” Confirm by clicking, “Yes, Start.”

## Elastic IPs

How do you set up practical DNS names for your web server? Using an address such as <http://ec2-75-101-197-112.compute-1.amazonaws.com/> is not likely to win the day with your customers. Setting up a DNS record that points to <http://www.yourdomain.com> is easy enough – until you reboot the server and the underlying DNS name and IP address both change.

AWS offers Elastic IP Addresses, 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.

Assign one to your application as follows:

- Click on the Elastic IPs link in the AWS Console
- Click “Allocate New Address.”
- Click the checkbox next to your new Elastic IP address, and click “Associate Address” under the Actions menu.
- In the Instance field, select your new web server in the dropdown menu that appears.
- Click Associate.
- Optionally, if you have a DNS server, create an “A” record resolving to your new Elastic IP address.
- You can now access your web site via this Elastic IP address or optionally via its friendly web site name, if you created a record in DNS.

### Two Important Notes:



1. As long as an Elastic IP address is associated with a running instance, there is no charge for it. However, an address that is not associated with a running instance costs \$0.01/hour. This prevents address hoarding; however, it also means that you need to delete any addresses you create, or you will incur an ongoing charge.
2. Load balancing (covered in the next section) requires CNAME records instead of “A” records. Therefore, Elastic IP is not required for load-balanced applications.



## Black Belt Booting

There are a number of advanced techniques that offer additional power and flexibility when booting Linux instances. For example, some organizations maintain a series of generic instances, and customize the images upon launch.

Common techniques include:

- Automatically check for updates upon each boot.
- Look in a well-known location, such as in a S3 bucket, for data or a script to tell the instance which packages to load.
- Pass **user data** to the instance to accomplish each of the above, or possibly instead of the other approaches.

## How to Pass User Data

The general format looks like this from the command line:

```
aws ec2 run-instances --image-id [ami id] --user-data "user data up  
to 2048 bytes" ...other params...
```

You can also paste user data into a text field via the AWS Console; however this is usually a form of automation – thus the command line example.

## Security Concerns

All of the methods except the final one require that your AMIs have security keys embedded in the image (unless you are using IAM Roles for EC2 instances). That is a serious security concern, and we do not recommend storing the keys on your instance.

By passing user data, the keys can be stored locally on a master control server. There is some risk that the keys will be compromised; however it's a much lower risk than storing keys on the AMI. However, there is still risk, because User Data cannot be encrypted. It does, however, arrive at the control plane encrypted via https.

## Appendix B – SSH to EC2 instances using MindTerm

Mac users should ignore this Appendix and instead use the native Terminal app or other preferred SSH application.

In this example, we will connect to an EC2 instance that has been configured for the lab. These instructions require Java to launch the MindTerm SSH client through the console.

1. Navigate to the EC2 section of the AWS Console by clicking on the **EC2** shortcut.

The screenshot shows the AWS Management Console interface. At the top, the navigation bar includes the AWS logo, a dropdown menu for 'Services', and the 'EC2' shortcut, which is highlighted with a red circle. To the right of the navigation bar, there are links for 'Training Example', 'N. California', and 'Support'. The main content area is titled 'Amazon Web Services' and is divided into several columns of service tiles. The 'Compute' column includes EC2 (Virtual Servers in the Cloud), Lambda (Run Code in Response to Events), and Storage & Content Delivery (S3, Storage Gateway, Glacier, CloudFront). The 'Database' column includes RDS, DynamoDB, ElastiCache, and Redshift. The 'Networking' column includes VPC, Direct Connect, and Route 53. The 'Administration & Security' column includes Directory Service, Identity & Access Management, Trusted Advisor, CloudTrail, Config, and CloudWatch. The 'Deployment & Management' column includes Elastic Beanstalk, OpsWorks, CloudFormation, and CodeDeploy. The 'Analytics' column includes EMR, Kinesis, and Data Pipeline. The 'Application Services' column includes SQS, SWF, AppStream, Elastic Transcoder, SES, and CloudSearch. The 'Mobile Services' column includes Cognito, Mobile Analytics, and SNS. The 'Enterprise Applications' column includes WorkSpaces and Zocalo. On the right side of the console, there are sections for 'Additional Resources' (Getting Started, AWS Console Mobile App, AWS Marketplace), 'Service Health' (All services operating normally), and 'Set Start Page' (Console Home).

2. Click on **Instances** in the left menu.

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The screenshot shows the AWS Management Console for the EC2 service. The left-hand navigation pane has 'Instances' circled in red. The main content area displays the 'Resources' section for the US West (N. California) region, showing counts for Running Instances, Volumes, Key Pairs, Placement Groups, Elastic IPs, Snapshots, Load Balancers, and Security Groups. Below this is the 'Create Instance' section with a 'Launch Instance' button. The 'Service Health' section shows that the service is operating normally in the US West (N. California) region.

3. Verify that the Instance is running and **click** on the instance and select **Connect** on the toolbar.

The screenshot shows the instance toolbar with the 'Connect' button circled in red. Below the toolbar is a table listing the instance details:

Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks
John Doe Web Server	i-664070ae	t2.micro	us-west-1c	running	2/2 checks passed

4. Make sure the User name is **ec2-user**, provide the location to your private key (confirm the Private Key Path value in your Workshop Configuration Details sheet, and make sure the Private Key Path includes the name of pem key file), and **check** the option to **save the key location** (not the key itself) in browser cache so you will not have to retype this location in every time you connect to EC2 instances. Then click on **Launch SSH Client**.

## Connect To Your Instance

I would like to connect with

☐ A standalone SSH client  
☒ A Java SSH Client directly from my browser (Java required)

Enter the required information in the fields below to connect to your instance. AWS automatically detects the key pair name, and Public IP for your instance. You need to enter the location and name of the .pem file containing your private key.

Public IP

54.67.104.170

User name

ec2-user

Key name

John-Doe-ImmersionDay.pem

Private key path

/Users/jdoe/John-Doe-ImmersionDa

Save key location

☐ Store in browser cache

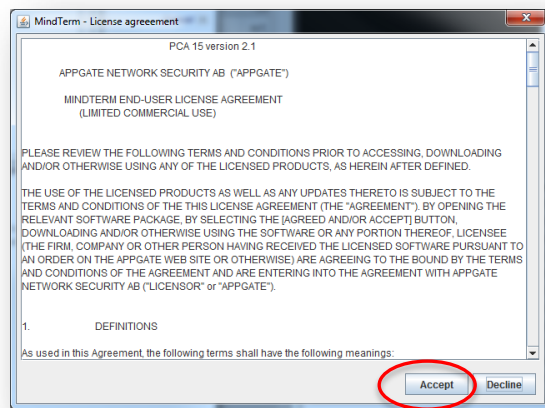
Launch SSH Client

Close

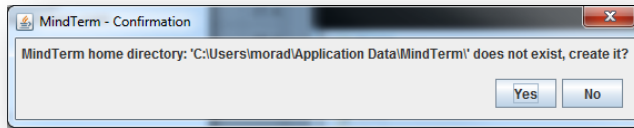
It can take some time for the MindTerm applet to download and run. If you do not have Java installed on your computer, or cannot launch the Java applet from your browser, please see **Appendix B** for instructions on using a 3<sup>rd</sup> party SSH client to connect to your EC2 instance.

If this is the first time you have used MindTerm, you will be prompted to accept the MindTerm EULA. **Click Accept:**

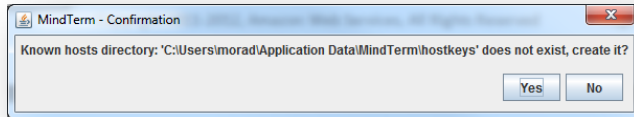
## Getting Started with Linux on Amazon EC2



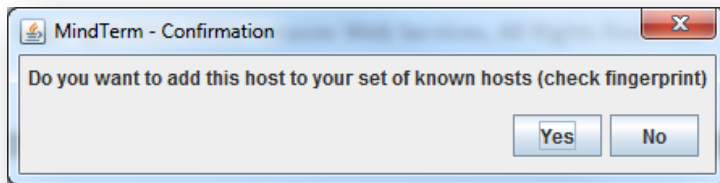
You will be asked to create a directory for MindTerm. Click Yes:



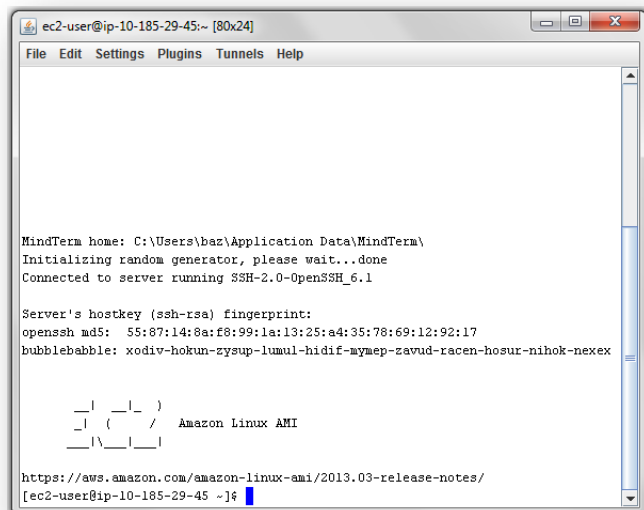
Next you will be asked to create a directory for MindTerm to use to store host keys. Click Yes:



And finally you will be asked if you want to store the host key for your Instance. At this point you have the option to verify the host key MindTerm is seeing with the host key provided by the AWS console to verify that you are connecting directly to your EC2 instance and not some third-party in the middle. Click Yes:



You should be logged into your Instance:



5. Launch the AWS CLI help manual from the terminal command line  
Type the following AWS CLI command:

```
$ aws help
```

Continue to press the **SPACE** key to scroll through the manual until you reach the end.  
Press the **Q** key to return back to the command line.

```
ec2-user@ip-172-31-24-127:~ [80x24]
File Edit Settings Plugins Tunnels Help

MindTerm home: C:\Users\baz\Application Data\MindTerm\
Initializing random generator, please wait...done
Connected to server running SSH-2.0-OpenSSH_6.1

Server's hostkey (ssh-rsa) fingerprint:
openssh md5: 60:2e:68:67:66:d2:60:76:51:b3:46:0a:29:3b:63:16
bubblebabble: xofen-siman-bokeh-kemor-kocof-gerib-cetap-kyhil-kykem-vitoh-puxax

Last login: Sat Sep 28 14:08:34 2013 from 87-238-80-64.amazon.com

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

https://aws.amazon.com/amazon-linux-ami/2013.03-release-notes/
[ec2-user@ip-172-31-24-127 ~]$ aws help
```

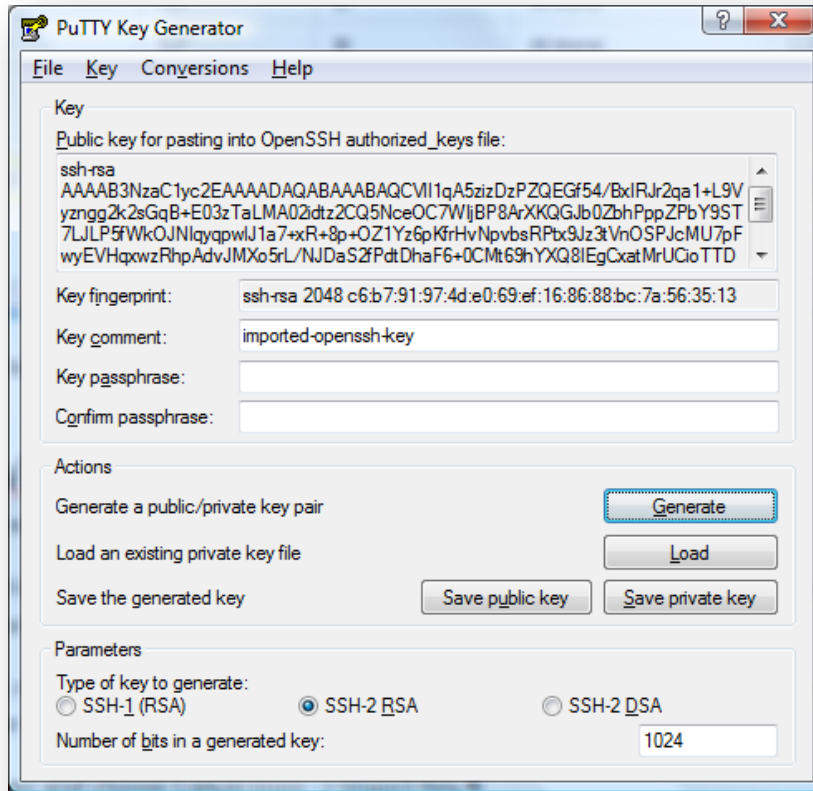
## Appendix C – Using a 3<sup>rd</sup> Party SSH Client

### Windows (PuTTY)

This is a Windows-only step, because other operating systems have SSH built in.  
Download and install Putty. The single word “putty” in Google will return a list of download sites. Be certain that you install both Putty and PuttyGen

Launch PuttyGen and choose Conversions -> Import Key.

Browse for **Bootcamp.pem** and import the key. The result will look similar to this:



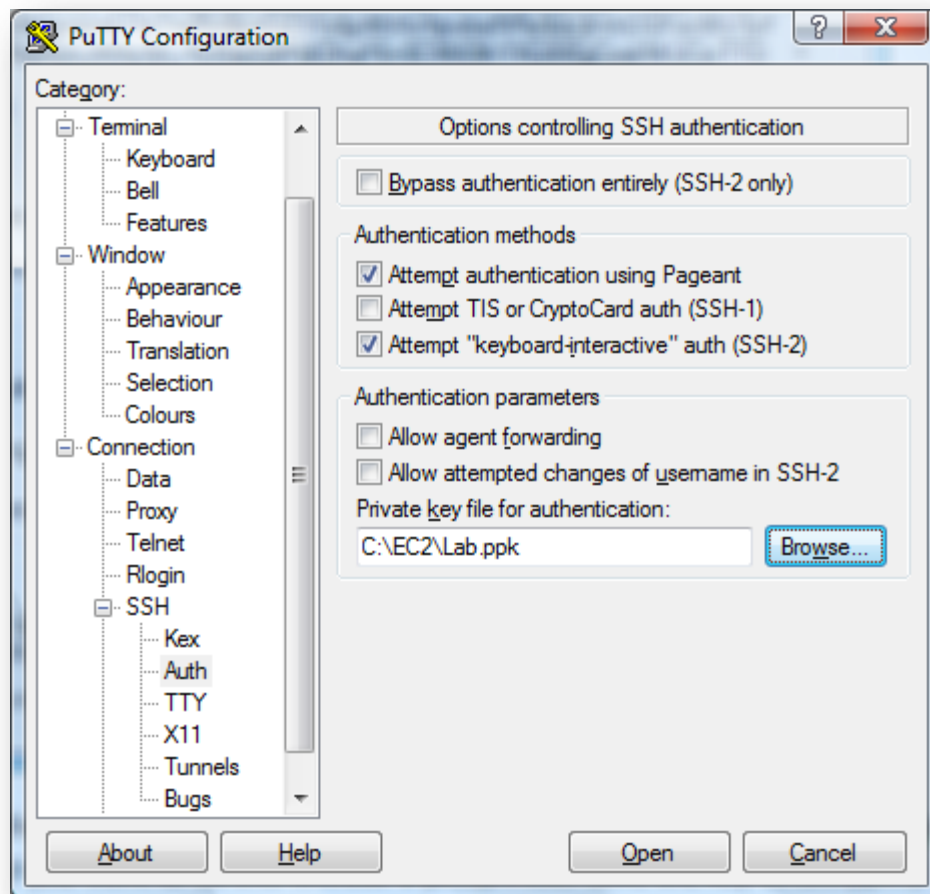
Save the key as the same file name with a .ppk extension (for the rest of these instructions, we will use the name Lab.ppk). Click on File -> Save as Private Key. Ignore the dialog that asks if you want to do this without a passphrase. Save the key as Lab.ppk.

Close PuttyGen.

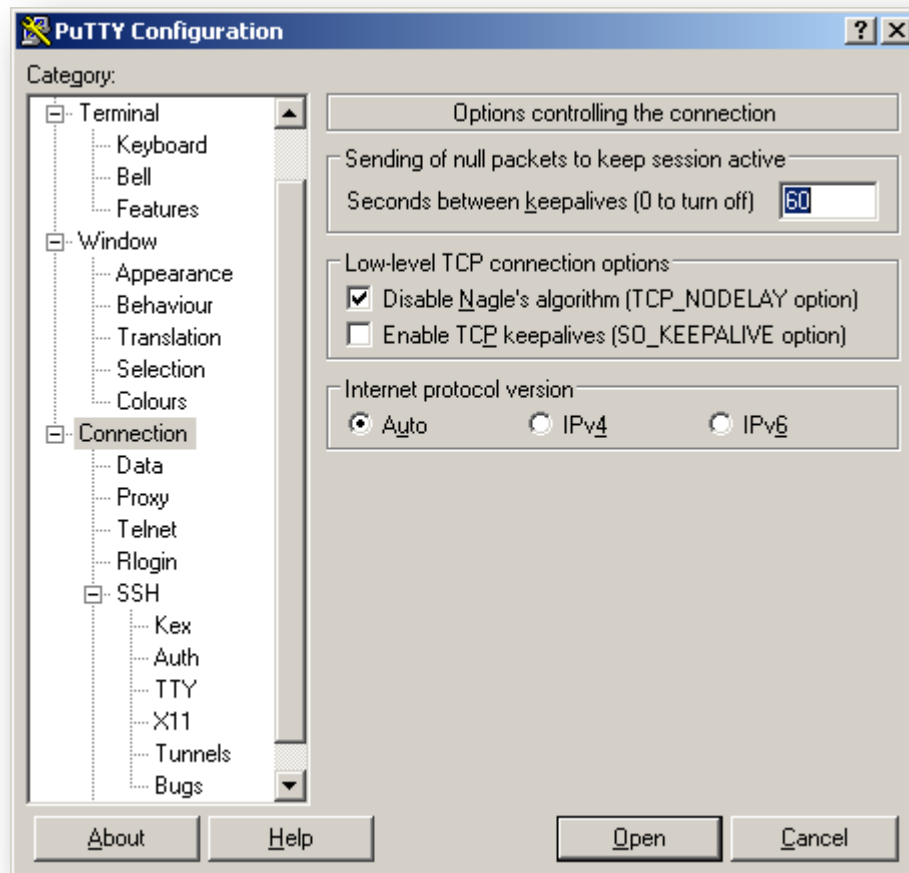
Using Putty, login in via SSH as follows:



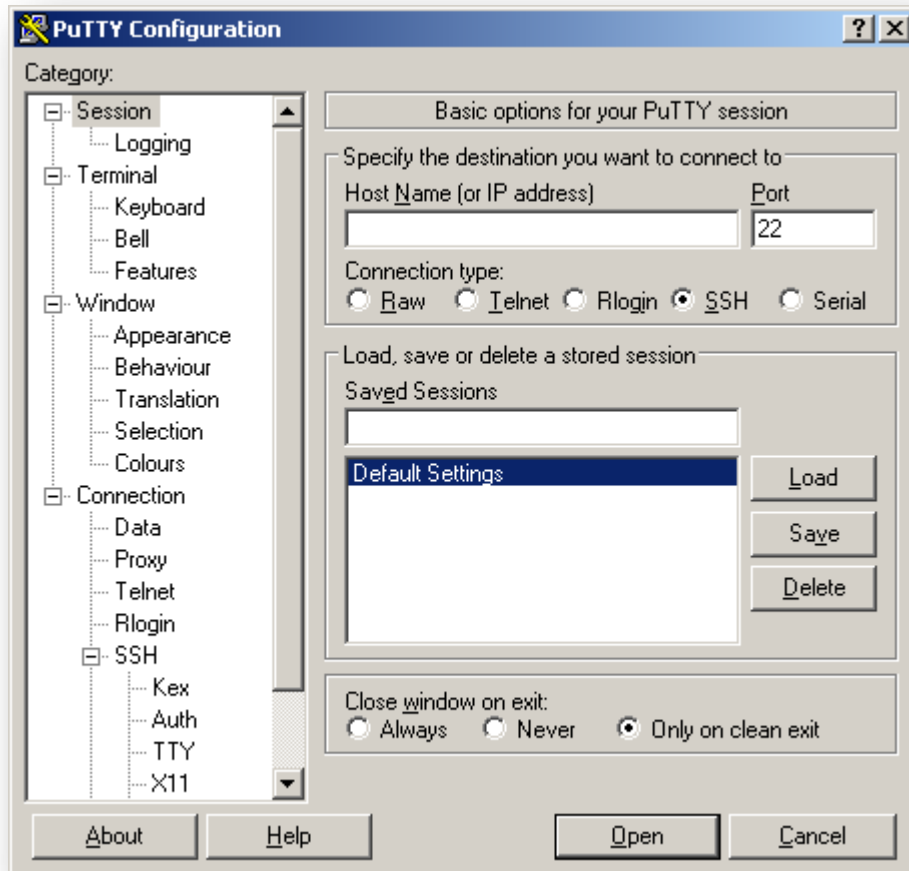
Launch Putty, then expand the SSH node and select the Auth sub-node. Enter Lab.ppk as the key name (shown below).



Make certain that *keepalive* has a value greater than zero. Otherwise your session will time out, which is annoying.



At this point (before entering the host address in the next step), it's a good time to save the settings. You can either highlight *Default* and update the settings, or pick a new name such as *Lab*.



If you are not certain how to find the DNS name of the server, click on the running instance and look at the lower pane.

The screenshot shows the AWS Management Console for the EC2 service. The left sidebar contains navigation links for EC2 Dashboard, Events, Tags, Reports, Limits, INSTANCES, IMAGES, ELASTIC BLOCK STORE, NETWORK & SECURITY, and AUTO SCALING. The 'INSTANCES' section is expanded, and 'Instances' is selected. The main pane displays a table of instances. The first instance, 'John Doe Web Server', is highlighted with a red box. Below the table, the details for this instance are shown. The 'Public DNS' is highlighted with a red box and is 'ec2-54-67-104-170.us-west-1.compute.amazonaws.com'.

Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks
John Doe Web Server	i-664070ae	t2.micro	us-west-1c	running	2/2 checks passed

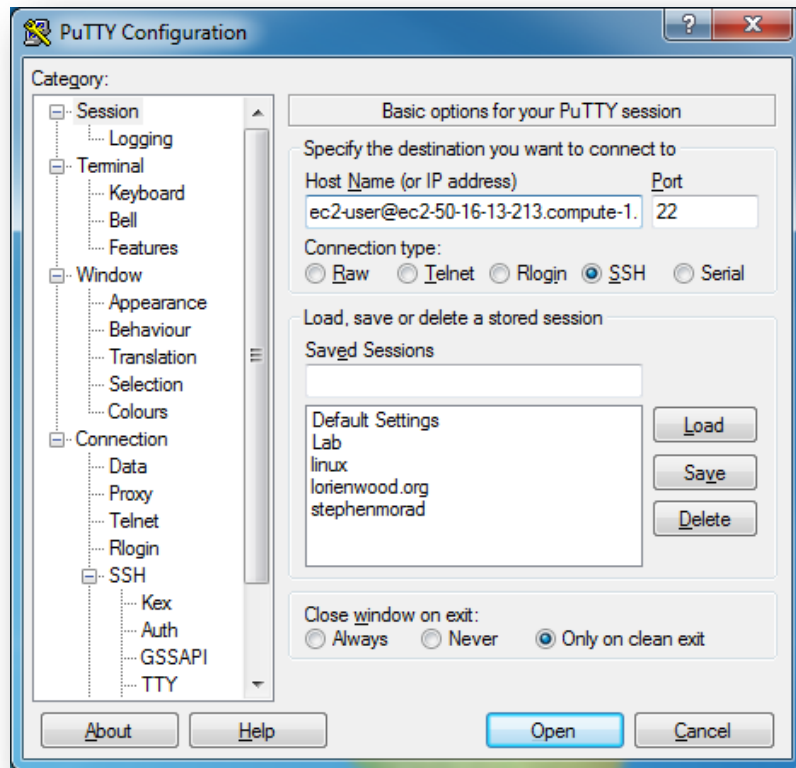
  

Instance: i-664070ae (John Doe Web Server) Public DNS: ec2-54-67-104-170.us-west-1.compute.amazonaws.com

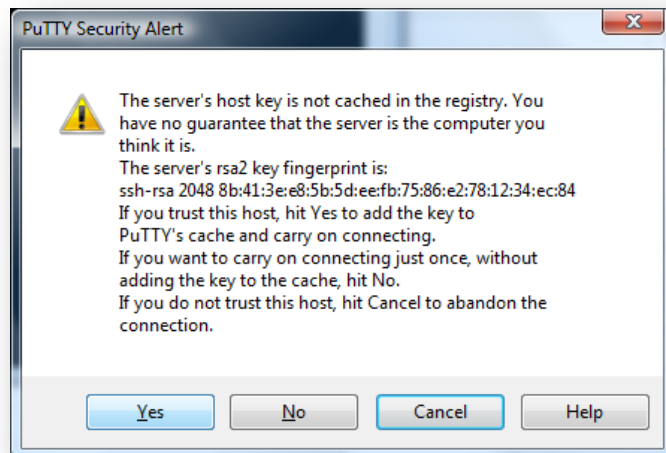
Description		Status Checks		Monitoring		Tags	
Instance ID	i-664070ae	Public DNS	ec2-54-67-104-170.us-west-1.compute.amazonaws.com	Public IP	54.67.104.170	Elastic IP	-
Instance state	running	Availability zone	us-west-1c	Security groups	John-Doe-WebTier . view		
Instance type	t2.micro						
Private DNS	ip-172-31-16-33.us-west-1.compute.internal						
Private IPs	172.31.16.33						

Find the Session node (top one in the list) and enter `ec2-user@` followed by the DNS name of the running instance (you must initially login as “**ec2-user**” to Amazon Linux instances). Then

click “Open” to connect. For example: `ec2-user@ec2-50-16-13-213.compute-1.amazonaws.com`

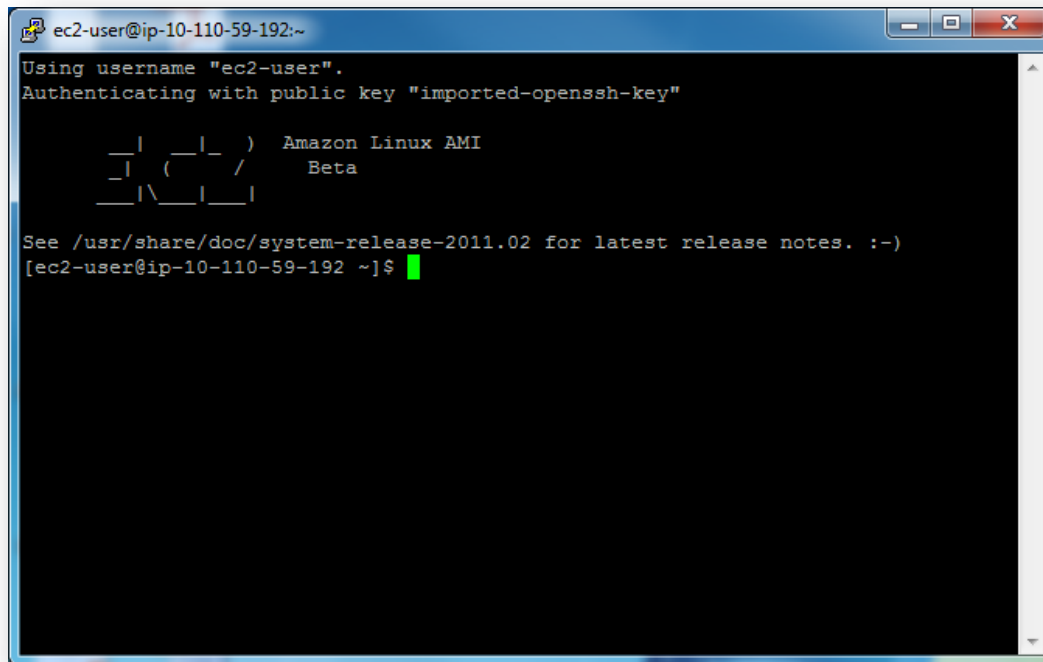


Click “Yes” to confirm that the fingerprint is OK.



**Security Tip:** The SSH fingerprint will eventually show up in the System Log and you can take that and compare it to protect against a Man in the middle attack.

You used the username “ec2-user”. The file Lab.ppk contains your password, so there is no need to enter one.



```
ec2-user@ip-10-110-59-192:~  
Using username "ec2-user".  
Authenticating with public key "imported-openssh-key"  
  
  _| _|_ ) Amazon Linux AMI  
  _| ( _| / Beta  
  __| \__|__|  
  
See /usr/share/doc/system-release-2011.02 for latest release notes. :-)  
[ec2-user@ip-10-110-59-192 ~]$
```

### Mac OS X or Linux (OpenSSH)

By default, both Mac OS X and Linux operating systems ship with an SSH client that you can use to connect to your EC2 Linux instances. To use the SSH client with the key you created, a few steps are required.

1. Ideally, put the private key you downloaded while launching your EC2 instance (generic-qwiklab.pem) into the .ssh directory in your home directory. For example:

```
Prompt> mv qwiklab-l14-701.pem ~/.ssh
```

2. Make sure your private key is only readable and writable by you (this assumes your private key was copied into your .ssh directory as described above):

```
Prompt> chmod 600 ~/.ssh/qwiklab-l14-701.pem
```

3. Use your private key when connecting to the instance. The format of the ssh client is as follows: `ssh -i <private_key> <user name>@<host name>`

Therefore connecting to your Amazon Linux instance will require a command similar to the following:

```
Prompt> ssh -i qwiklab-l14-701.pem ec2-user@<EC2 Host  
Name or EIP>
```