

# **Enterprise Standards and Best Practices for IT Infrastructure**

**Lab 01 and 02-Lab Report**

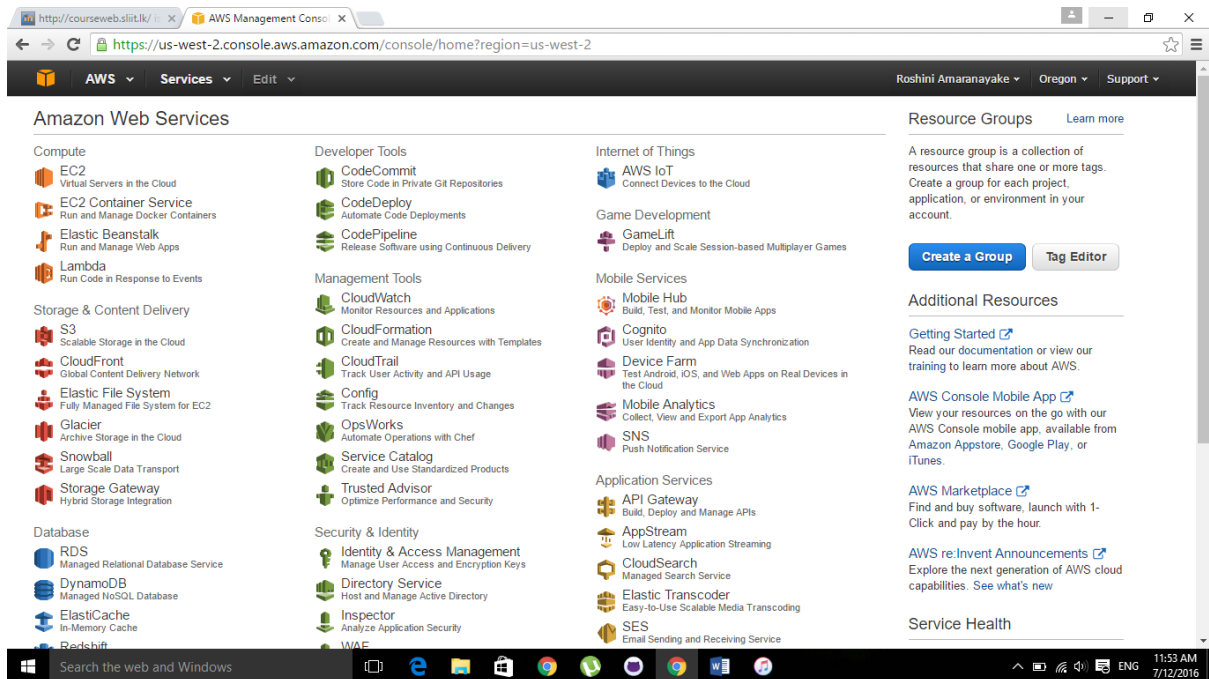
**Amaranayake R.E. - IT13069728**

**Software Requirements Specification**

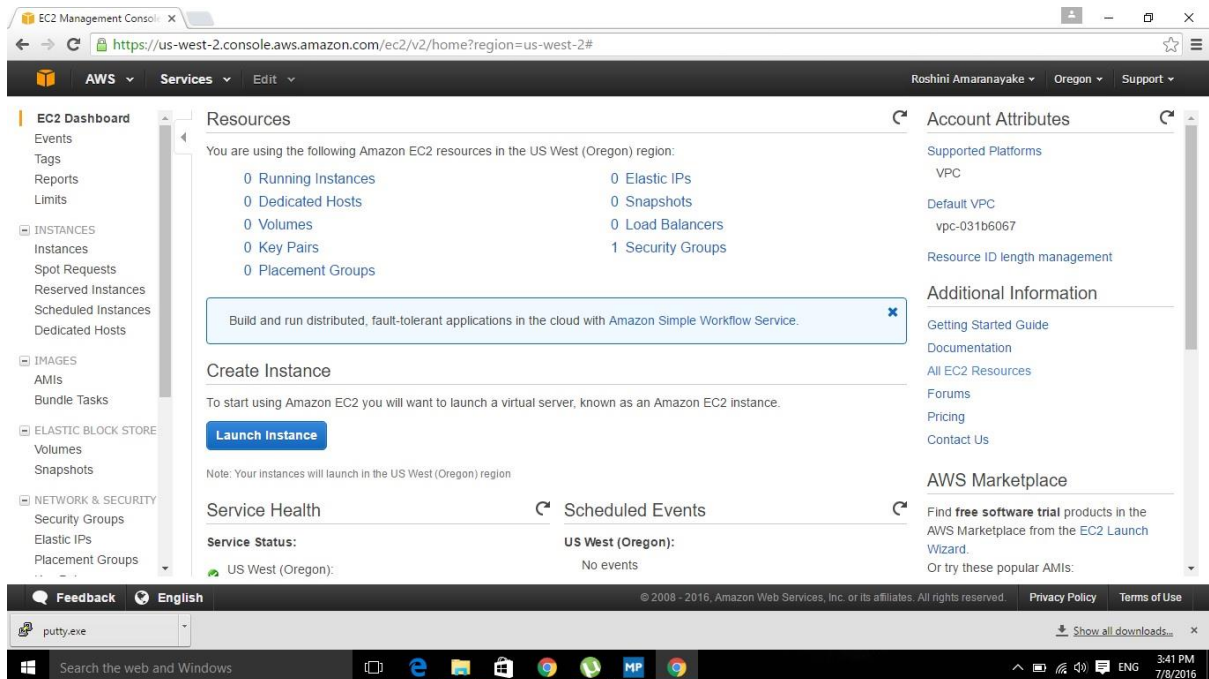
**Sri Lanka Institute of Information Technology  
B.Sc. Special (Honors) Degree in Information Technology  
Specialized in Information Technology**

# Creating an Amazon EBS-Backed Windows AMI

Step 01: Select EC2 web service (virtual server in cloud) from Amazon web servers.



Step 02: Select Launch Instance under Create Instance in main interface.



## Step 03: Choose an Amazon Machine image (AMI).

(Select Microsoft windows Server 2012 R2 Base)

The screenshot shows the AWS Management Console interface for the 'Launch Instance Wizard'. The first step, 'Choose an Amazon Machine Image (AMI)', is active. It displays a list of AMIs. The selected AMI is 'Microsoft Windows Server 2012 R2 Base' with ID 'ami-8d0acfed'. Below the list, there is a banner for Amazon RDS with the text 'Are you launching a database instance? Try Amazon RDS.' and a 'Launch a database using RDS' button. The console also shows a task bar at the bottom with various application icons and a system clock.

Family	Type	vCPUs	Memory (GiB)	Instance Storage (GB)	EBS-Optimized Available	Network Performance
General purpose	t2.nano	1	0.5	EBS only	-	Low to Moderate
General purpose	t2.micro	1	1	EBS only	-	Low to Moderate
General purpose	t2.small	1	2	EBS only	-	Low to Moderate
General purpose	t2.medium	2	4	EBS only	-	Low to Moderate
General purpose	t2.large	2	8	EBS only	-	Low to Moderate

## Step 04: Choose an Instance type.

The screenshot shows the AWS Management Console interface for the 'Launch Instance Wizard'. The second step, 'Choose an Instance Type', is active. It displays a table of instance types. The selected instance type is 't2.micro'. The table includes columns for Family, Type, vCPUs, Memory, Instance Storage, EBS-Optimized Available, and Network Performance. Below the table, there are buttons for 'Cancel', 'Previous', 'Review and Launch', and 'Next: Configure Instance Details'.

Family	Type	vCPUs	Memory (GiB)	Instance Storage (GB)	EBS-Optimized Available	Network Performance
General purpose	t2.nano	1	0.5	EBS only	-	Low to Moderate
General purpose	t2.micro	1	1	EBS only	-	Low to Moderate
General purpose	t2.small	1	2	EBS only	-	Low to Moderate
General purpose	t2.medium	2	4	EBS only	-	Low to Moderate
General purpose	t2.large	2	8	EBS only	-	Low to Moderate

## Step 05: Review Instance Launch.

EC2 Management Console

https://us-west-2.console.aws.amazon.com/ec2/v2/home?region=us-west-2#LaunchInstanceWizard:

AWS Services Edit

Roshini Amaranayake Oregon Support

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

### 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, `launch-wizard-1`, 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](#)

**Microsoft Windows Server 2012 R2 Base - ami-8d0acfed**

Free tier eligible Microsoft Windows 2012 R2 Standard edition with 64-bit architecture. [English]  
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

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

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Step 06: After launch there is popup box which is to select an existing key pair or create new key pair. Select new key pair and download the key pair. After downloading the key pair click Launch Instance.

EC2 Management Console

https://us-west-2.console.aws.amazon.com/ec2/v2/home?region=us-west-2#LaunchInstanceWizard:

AWS Services Edit

Roshini Amaranayake Oregon Support

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

### Step 7: Review Instance Launch

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AMI Details [Edit AMI](#)

**Microsoft Windows Server 2012 R2 Base - ami-8d0acfed**

Free tier eligible Microsoft Windows 2012 R2 Standard edition with 64-bit architecture. [English]  
Root Device Type: ebs Virtualization type: hvm

Instance Type [Edit instance type](#)

Instance Type	ECUs
t2.micro	Variable

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

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#### 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.

Create a new key pair

Key pair name  
KeyPair01

[Download Key Pair](#)

You have to download the **private key file** (\*.pem file) before you can continue. Store it in a secure and accessible location. You will not be able to download the file again after it's created.

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

## Step 07: View instance after launching.

The screenshot shows the AWS Management Console 'Launch Status' page. At the top, a green banner states 'Your instances are now launching' with the instance ID 'i-04b27187dff6bab99' and a link to 'View launch log'. Below this, a blue banner prompts the user to 'Get notified of estimated charges'. The main content area explains how to connect to instances and lists helpful resources like the 'Amazon EC2: User Guide' and 'Amazon EC2: Microsoft Windows Guide'. The bottom of the console shows a Windows taskbar with a search bar and various application icons.

**Launch Status**

✓ **Your instances are now launching**  
The following instance launches have been initiated: i-04b27187dff6bab99 [View launch log](#)

ℹ **Get notified of estimated charges**  
Create billing alerts to get an email notification when estimated charges on your AWS bill exceed an amount you define (for example, if you exceed the free usage tier).

**How to connect to your instances**

Your instances are launching, and it may take a few minutes until they are in the **running** state, when they will be ready for you to use. Usage hours on your new instances will start immediately and continue to accrue until you stop or terminate your instances.

Click **View Instances** to monitor your instances' status. Once your instances are in the **running** state, you can **connect** to them from the Instances screen. [Find out how to connect to your instances.](#)

▼ Here are some helpful resources to get you started

- [How to connect to your Windows instance](#)
- [Learn about AWS Free Usage Tier](#)
- [Amazon EC2: User Guide](#)
- [Amazon EC2: Microsoft Windows Guide](#)
- [Amazon EC2: Discussion Forum](#)

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KeyPair01.pem putty.exe Show all downloads...

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## Step 08: Select the created instance and then connect.

The screenshot shows the AWS Management Console 'Instances' page. The instance 'i-04b27187dff6bab99' is selected, and its details are displayed in the main pane. The instance is in the 'running' state, and its public IP address is '54.213.206.216'. The console also shows a list of instances in a table format.

**Instances**

Launch Instance Connect Actions

Filter by tags and attributes or search by keyword

Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Status	Public DNS	Public IP
	i-04b27187dff6bab99	t2.micro	us-west-2b	running	Initializing	None	ec2-54-213-206-216.us-west-2.compute.amazonaws.com	54.213.206.216

**Instance: i-04b27187dff6bab99** Public DNS: ec2-54-213-206-216.us-west-2.compute.amazonaws.com

Description Status Checks Monitoring Tags

Instance ID: i-04b27187dff6bab99 Public DNS: ec2-54-213-206-216.us-west-2.compute.amazonaws.com

Instance state: running Public IP: 54.213.206.216

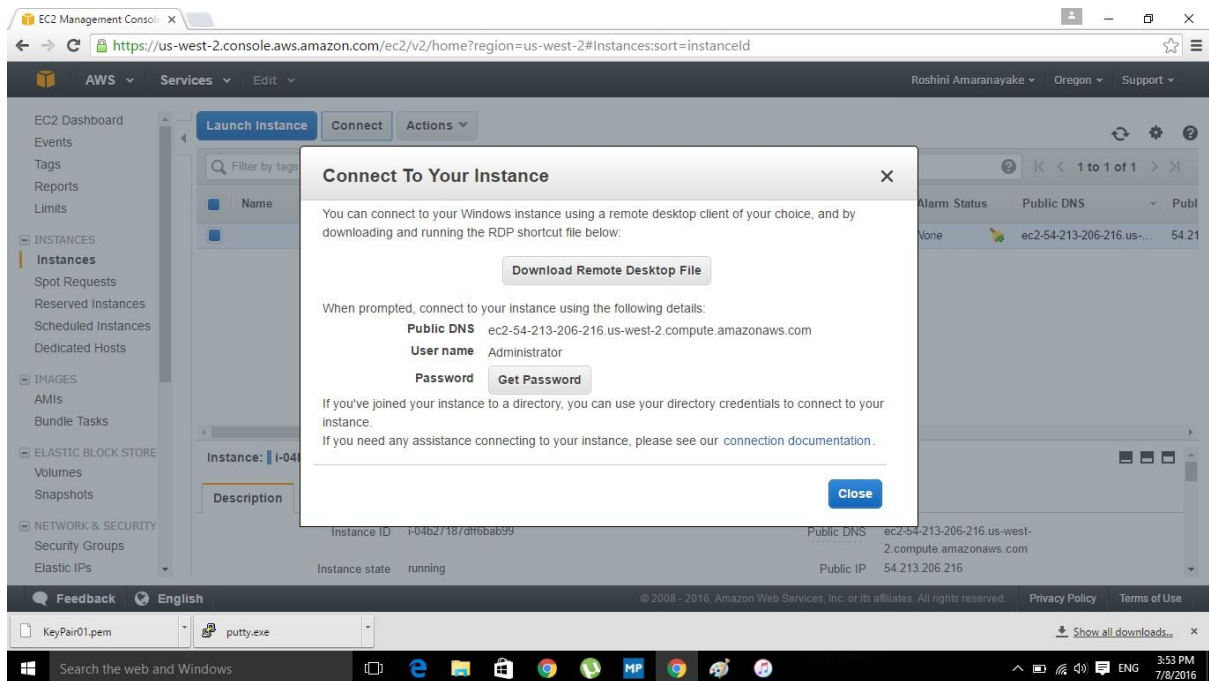
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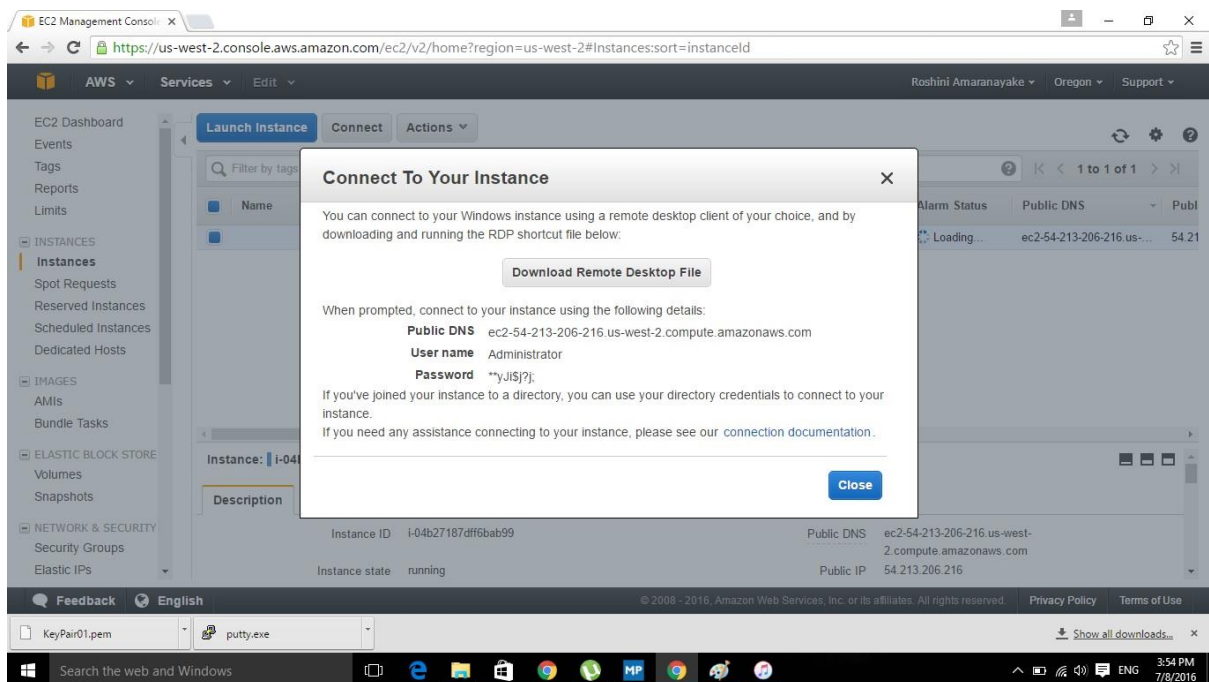
Search the web and Windows



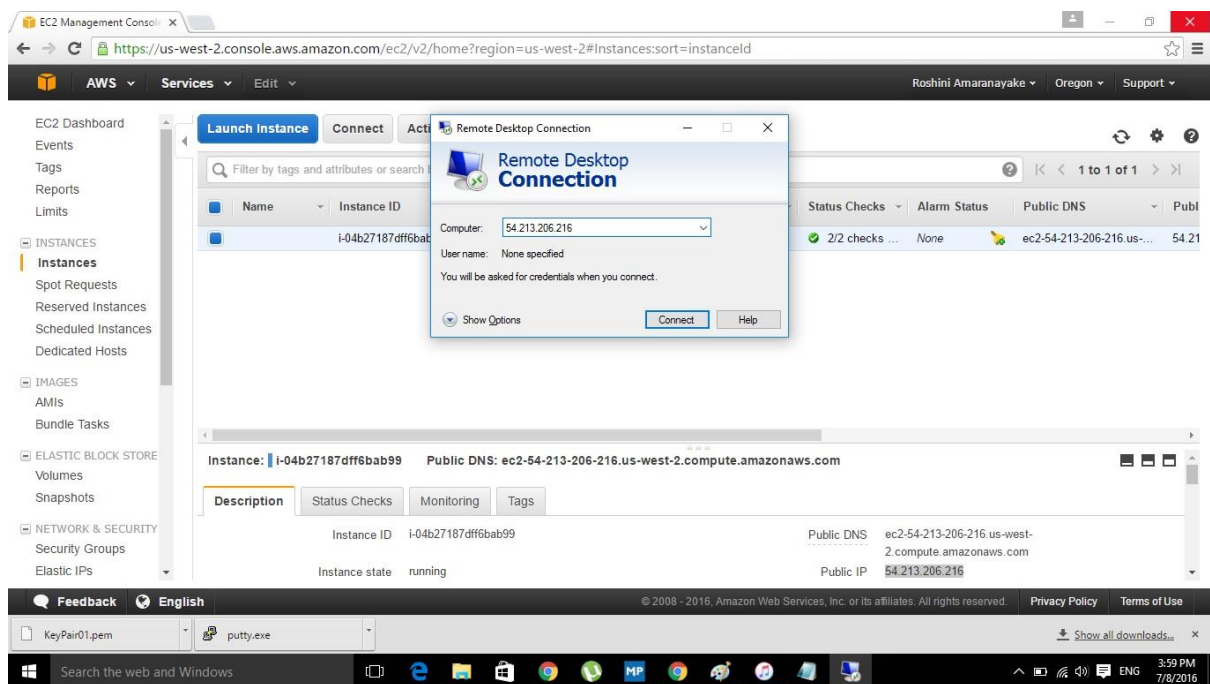
## Step 09: Get a password from Connect to Your Instance window.



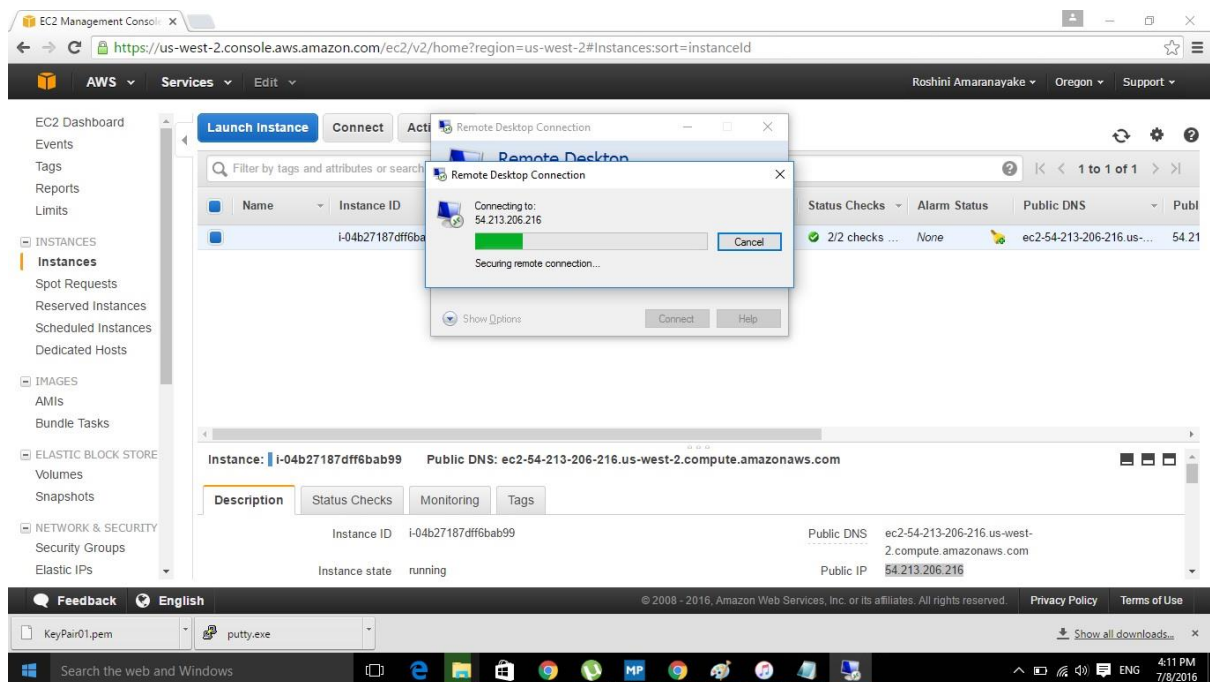
## Step 10: Decrypt the password. Note down the user name and the decrypted password.



## Step 11: Open Remote Desktop Connection. Provide the public IP of the launched instance.



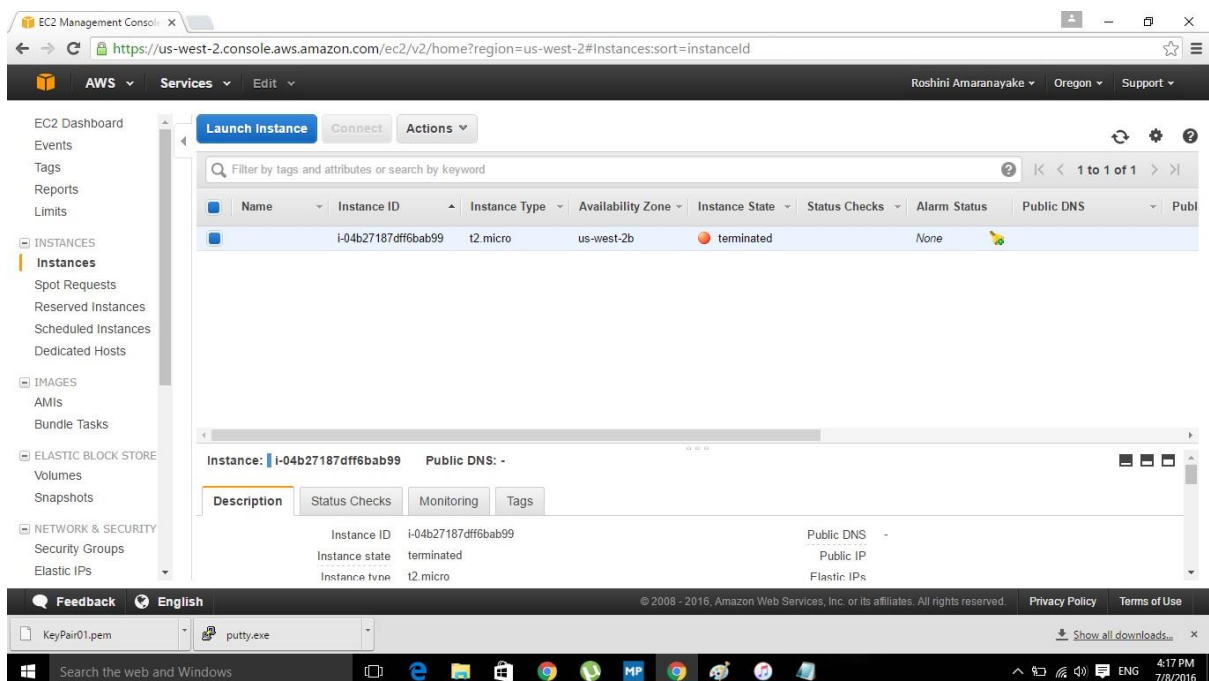
## Step 12: Connect to the created instance.



Step 13: Log in to Windows Server 2012 R2 using the given user name and the decrypted password.



Step 14: Right click on the created server instance and terminate it from the instance state. (Right click on instance -> Instance State -> Stop)





# Creating an Amazon EBS-Backed Linux AMI

## Step 01: Choose an Amazon Machine Image (AMI). Select Amazon Linux AMI 2016.03.3 (HVM), SSD Volume Type

The screenshot shows the AWS Management Console's 'Launch Instance Wizard' at Step 1: Choose an Amazon Machine Image (AMI). The console is in the 'us-west-2' region. The wizard has seven steps: 1. Choose AMI, 2. Choose Instance Type, 3. Configure Instance, 4. Add Storage, 5. Tag Instance, 6. Configure Security Group, and 7. Review. The 'Amazon Linux AMI 2016.03.3 (HVM), SSD Volume Type' (ami-7172b611) is selected. It is a 64-bit AMI, EBS-eligible, and includes Docker, PHP, MySQL, PostgreSQL, and other packages. The root device type is ebs and the virtualization type is hvm. Other AMIs like Red Hat Enterprise Linux 7.2 and SUSE Linux Enterprise Server 12 SP1 are also visible.

Step 1: Choose an Amazon Machine Image (AMI)

An AMI is a template that contains the software configuration (operating system, application server, and applications) required to launch your instance. You can select an AMI provided by AWS, our user community, or the AWS Marketplace; or you can select one of your own AMIs.

Quick Start

My AMIs

AWS Marketplace

Community AMIs

Free tier only

Amazon Linux AMI 2016.03.3 (HVM), SSD Volume Type - ami-7172b611

The Amazon Linux AMI is an EBS-backed, AWS-supported image. The default image includes AWS command line tools, Python, Ruby, Perl, and Java. The repositories include Docker, PHP, MySQL, PostgreSQL, and other packages.

Root device type: ebs Virtualization type: hvm

Red Hat Enterprise Linux 7.2 (HVM), SSD Volume Type - ami-775e4f16

Red Hat Enterprise Linux version 7.2 (HVM), EBS General Purpose (SSD) Volume Type

Root device type: ebs Virtualization type: hvm

SUSE Linux Enterprise Server 12 SP1 (HVM), SSD Volume Type - ami-d2627db3

SUSE Linux Enterprise Server 12 Service Pack 1 (HVM), EBS General Purpose (SSD) Volume Type. Public Cloud, Advanced Systems Management, Web and Scripting, and Legacy modules enabled.

## Step 02: Choose an Instance Type. Then review and launch

The screenshot shows the AWS Management Console's 'Launch Instance Wizard' at Step 2: Choose an Instance Type. The wizard has seven steps: 1. Choose AMI, 2. Choose Instance Type, 3. Configure Instance, 4. Add Storage, 5. Tag Instance, 6. Configure Security Group, and 7. Review. The 't2.micro' instance type is selected. It is a General purpose instance, 1 vCPU, 1 GiB memory, and EBS-eligible. The current selection is 't2.micro (Variable ECUs, 1 vCPUs, 2.5 GHz, Intel Xeon Family, 1 GiB memory, EBS only)'. The table below shows the available instance types.

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 type="checkbox"/>	General purpose	t2.nano	1	0.5	EBS only	-	Low to Moderate
<input checked="" type="checkbox"/>	General purpose	t2.micro Free tier eligible	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	t2.large	2	8	EBS only	-	Low to Moderate

Cancel Previous Review and Launch Next: Configure Instance Details

## Step 03: Review Instance Launch.

EC2 Management Console | PuTTY Download Page

https://us-west-2.console.aws.amazon.com/ec2/v2/home?region=us-west-2#LaunchInstanceWizard:

AWS Services Edit

Roshini Amaranayake Oregon Support

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

### 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, launch-wizard-2, 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 2016.03.3 (HVM), SSD Volume Type - ami-7172b611**

**Free tier eligible**

The Amazon Linux AMI is an EBS-backed, AWS-supported image. The default image includes AWS command line tools, Python, Ruby, Perl, and Java. The repositories include Docker, PHP, MySQL, PostgreSQL, and 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

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

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## Step 04: Choose create a new key pair to download a new key pair. Then give a key pair name. Then select Launch Instance.

EC2 Management Console | PuTTY Download Page

https://us-west-2.console.aws.amazon.com/ec2/v2/home?region=us-west-2#LaunchInstanceWizard:

AWS Services Edit

Roshini Amaranayake Oregon Support

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

### 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.

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AMI Details [Edit AMI](#)

**Amazon Linux AMI 2016.03.3 (HVM), SSD Volume Type - ami-7172b611**

**Free tier eligible**

The Amazon Linux AMI is an EBS-backed, AWS-supported image. The default image includes AWS command line tools, Python, Ruby, Perl, and Java. The repositories include Docker, PHP, MySQL, PostgreSQL, and 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

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

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#### 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](#).

Create a new key pair

**Key pair name**

KeyPair02

[Download Key Pair](#)

You have to download the **private key file** (\*.pem file) before you can continue. Store it in a secure and accessible location. You will not be able to download the file again after it's created.

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

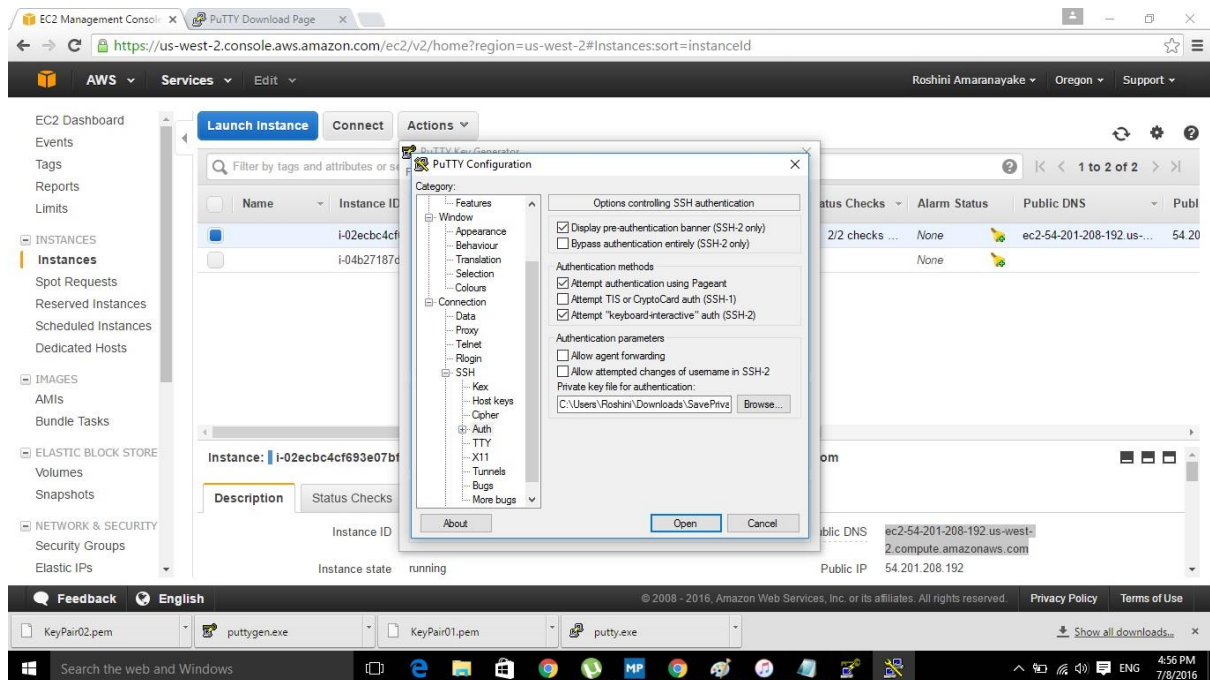
## Step 05: View Instances after launching.

The screenshot shows the AWS Management Console interface. The top navigation bar includes the AWS logo, 'Services', 'Edit', and user information 'Roshini Amaranayake' in the 'Oregon' region. The main content area is titled 'Launch Status' and contains several informational boxes. The first box, with a green checkmark, states 'Your instances are now launching' and lists the instance IDs: 'i-02ecbc4cf693e07bf'. Below this, a blue box with an information icon says 'Get notified of estimated charges'. Further down, a section titled 'How to connect to your instances' provides instructions on monitoring the 'running' state and connecting to the instances. At the bottom, there are links to helpful resources like 'How to connect to your Linux instance' and 'Amazon EC2: User Guide'. The bottom of the console shows a Windows taskbar with various application icons and a system clock indicating 4:46 PM on 7/8/2016.

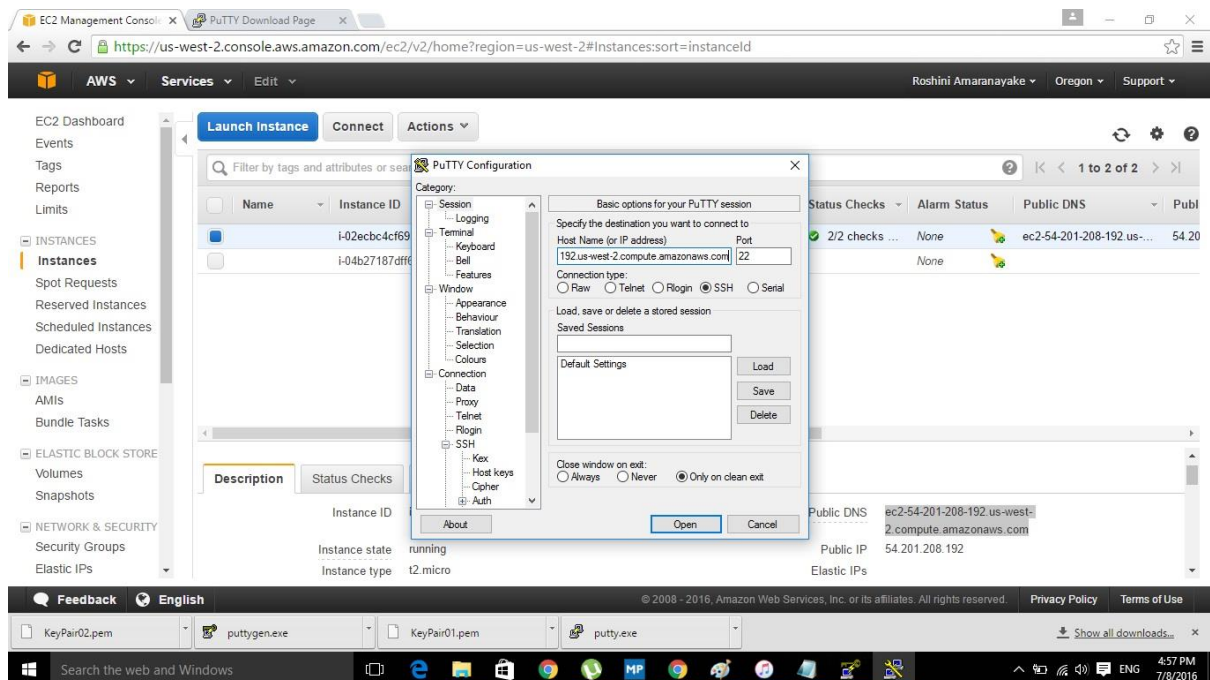
## Step 06: Open PUTTY Key Generator. Then browse and load the downloaded key pair file and save it as a private key.

This screenshot shows the AWS Management Console with the 'Instances' page selected in the left-hand navigation menu. The main area displays a list of instances. Overlaid on this is the 'PuTTY Key Generator' dialog box. The 'Key' tab is active, showing a public key for pasting into an OpenSSH authorized\_keys file. A 'PuTTYGen Notice' dialog box is also open, stating 'Successfully imported foreign key (OpenSSH SSH-2 private key (old PEM format))' and instructing the user to use the 'Save private key' command to save it in PuTTY's own format. The 'Parameters' section at the bottom of the PuTTY Key Generator shows 'Type of key to generate' set to 'RSA' and 'Number of bits in a generated key' set to '2048'. The Windows taskbar at the bottom shows the system clock at 4:48 PM on 7/8/2016.

Step 07: Open PUTTY Configuration. Go to Connection category for SSH authentication. (Connection -> SSH -> Auth) Then under authentication parameters browse saved private key and open.



Step 8: Go back to Session category in PUTTY Configuration. Copy the Public DNS of created instance and paste it under Host Name. Set Connection type to SSH and open.





Step 9: Log in to Linux by giving user name in the kernel. (ec2-user). Type some Linux commands to check. (ls -al)

The screenshot shows the AWS Management Console interface with a PuTTY terminal window open. The terminal displays the login process for the 'ec2-user' on an Amazon Linux AMI. The user successfully logs in and runs the command 'ls -al', which shows the directory structure of the home directory. The AWS console shows the details of the EC2 instance 'i-02ecbc4cf693e07bf', which is in a 'running' state.

```
login as: ec2-user
Authenticating with public key "imported-openssh-key"

Amazon Linux AMI

https://aws.amazon.com/amazon-linux-ami/2016.03-release-notes/
1 package(s) needed for security, out of 1 available
Run "sudo yum update" to apply all updates.
[ec2-user@ip-172-31-27-217 ~]$ ls -al
total 24
drwxr-xr-x 3 ec2-user ec2-user 4096 Jul  8 11:16 .
drwxr-xr-x 3 root    root      4096 Jul  8 11:16 ..
-rw-r--r-- 1 ec2-user ec2-user 18 Feb 19 20:05 .bash_logout
-rw-r--r-- 1 ec2-user ec2-user 193 Feb 19 20:05 .bash_profile
-rw-r--r-- 1 ec2-user ec2-user 124 Feb 19 20:05 .bashrc
drwxr-xr-x 2 ec2-user ec2-user 4096 Jul  8 11:16 .ssh
[ec2-user@ip-172-31-27-217 ~]$
```

Availability Zone	Instance State	Status Checks	Alarm Status	Public DNS	Public IP
us-west-2a	running	2/2 checks ...	None	ec2-54-201-208-192.us-west-2.compute.amazonaws.com	54.201.208.192
us-west-2b	terminated		None		

Step 10: Terminate or stop the instance from instance state.(Right click on instance -> Instance State -> Terminate/ Stop).

The screenshot shows the AWS Management Console interface with the EC2 instance list. The instance 'i-02ecbc4cf693e07bf' is now in a 'stopped' state. The console shows the details of the instance, including its ID, type, availability zone, and public DNS.

Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Status	Public DNS	Public IP
	i-02ecbc4cf693e07bf	t2.micro	us-west-2a	stopped		None		
	i-04b27187dff6bab99	t2.micro	us-west-2b	terminated		None		