



SRI LANKA INSTITUTE OF INFORMATION TECHNOLOGY

Enterprise Standards and Best Practices for IT Infrastructure

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Content

Creating a Windows 2012 server in AWS environment.....	1
Creating a Linux instance in AWS.....	11
Create a MySql Database using Relational Database Service option AWS.....	16

Amazon Web Services (AWS)

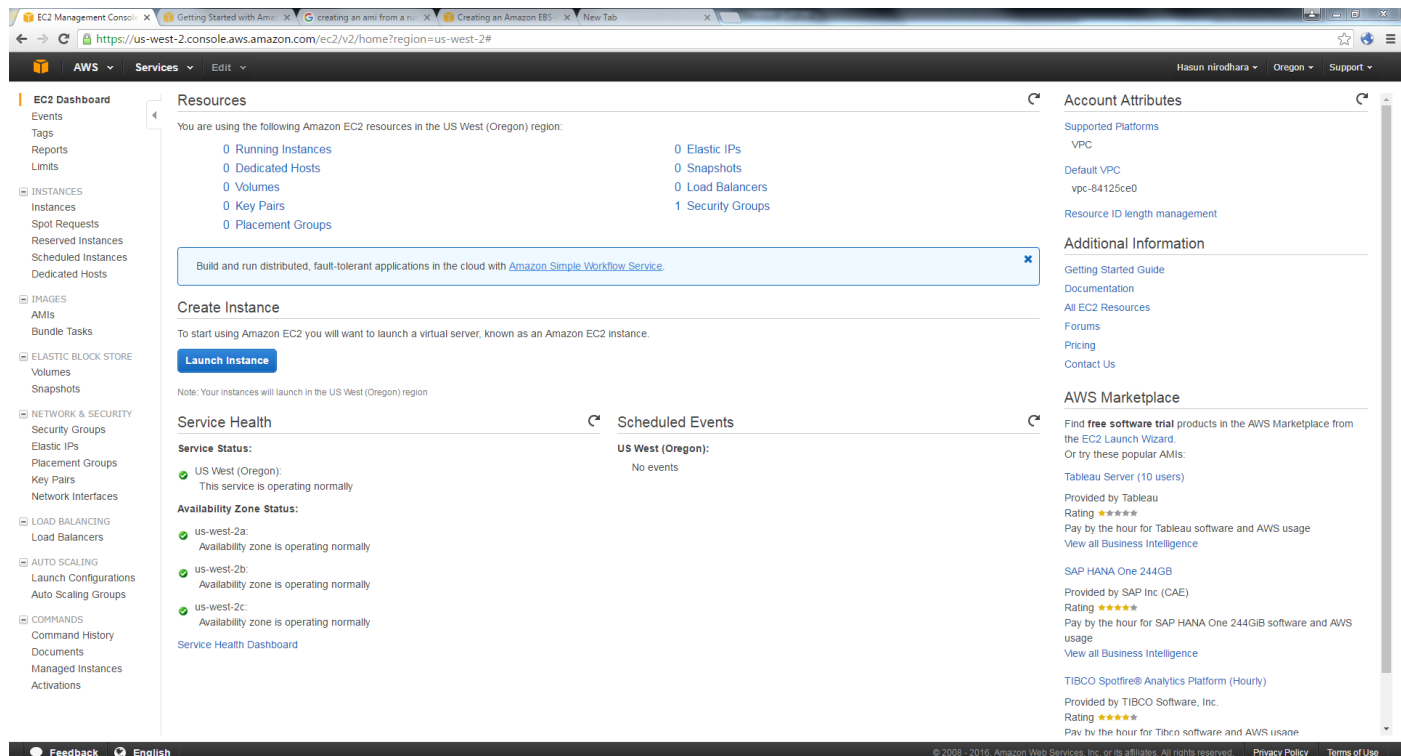
Amazon Web services (AWS) is a cloud platform which provides various on demand cloud services for the industrial and personal objectives. In terms of services AWS offers, compute, database functionalities and storage, content delivery, operating systems and other server functions to help businesses to scale and grow in their specialization.

Task 01

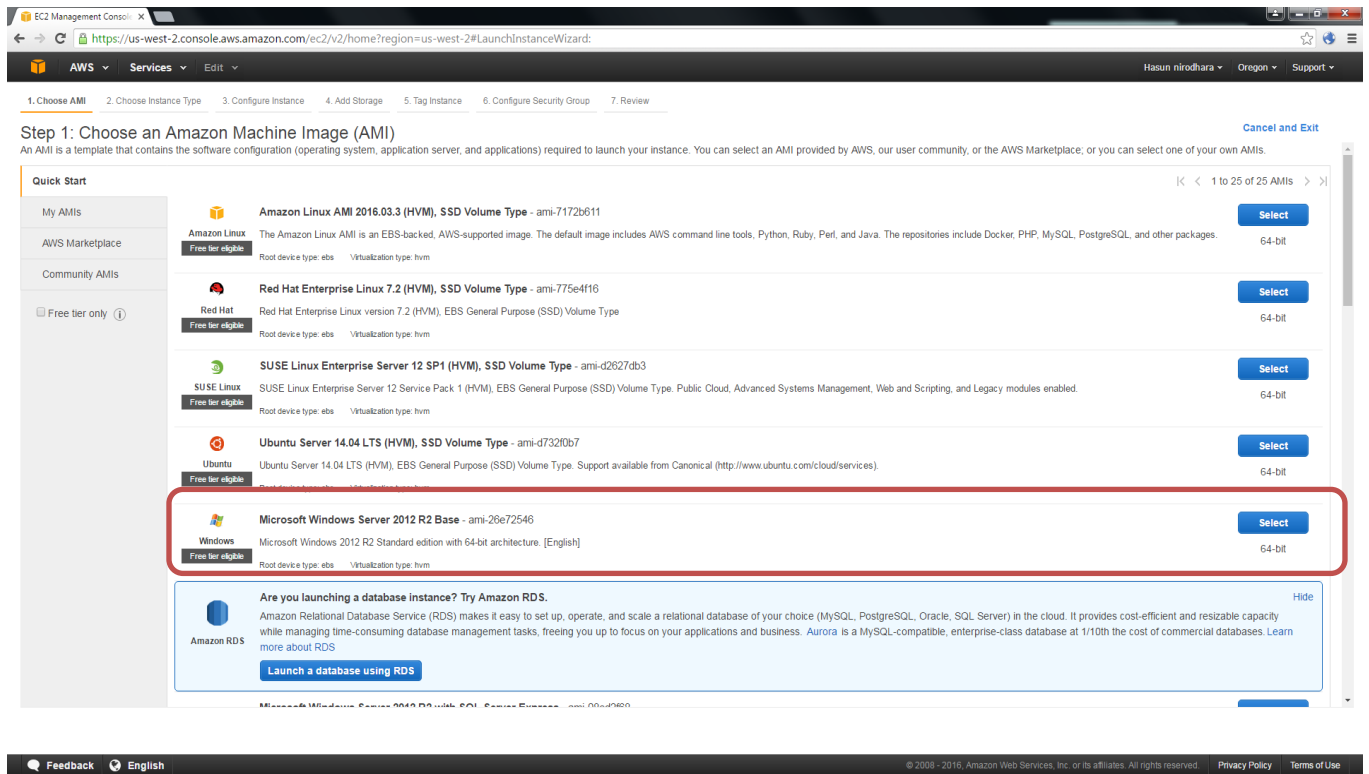
Creating a Windows 2012 server in AWS environment.

➤ Requirements

- It is required to have a AWS account with verified payment method.
- Log in to the AWS console with the AWS account credentials and select **EC2** platform . Automatically it will direct to the Instance menu. In the menu all the details of the instances will be shown.
- Select **Launch Instance** to create a new instance.



- Next window will show all the instances models this AWS platform compatible with and select **Microsoft Windows Server 2012 R2 Base** and select **Next: Configure Instance**.



- In the next window select the PC performance as per the requirement. In this case leave the selection as it is.

EC2 Management Console

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

AWS Services Edit

Hasun nirodhara 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 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 (GiB)	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 <small>Free tier eligible</small>	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
<input type="checkbox"/>	General purpose	m4.large	2	8	EBS only	Yes	Moderate
<input type="checkbox"/>	General purpose	m4.xlarge	4	16	EBS only	Yes	High
<input type="checkbox"/>	General purpose	m4.2xlarge	8	32	EBS only	Yes	High
<input type="checkbox"/>	General purpose	m4.4xlarge	16	64	EBS only	Yes	High
<input type="checkbox"/>	General purpose	m4.10xlarge	40	160	EBS only	Yes	10 Gigabit
<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

Cancel Previous **Review and Launch** Next: Configure Instance Details

Feedback English

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- Keep the all settings in the next page as default or else it can be changes as required.

EC2 Management Console

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

AWS Services Edit

Hasun nirodhara 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 3: Configure Instance Details

Configure the instance to suit your requirements. You can launch multiple instances from the same AMI, request Spot instances to take advantage of the lower pricing, assign an access management role to the instance, and more.

Number of instances: 1 Launch into Auto Scaling Group

Purchasing option: ☐ Request Spot instances

Network: vpc-84125ced (172.31.0.0/16) (default) Create new VPC

Subnet: No preference (default subnet in any Availability Zone) Create new subnet

Auto-assign Public IP: Use subnet setting (Enable)

Domain join directory: None Create new directory

IAM role: None Create new IAM role

Shutdown behavior: Stop

Enable termination protection: ☐ Protect against accidental termination

Monitoring: ☐ Enable CloudWatch detailed monitoring
Additional charges apply.

Tenancy: Shared - Run a shared hardware instance
Additional charges will apply for dedicated tenancy.

Advanced Details

Cancel Previous **Review and Launch** Next: Add Storage

Feedback English

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- In the next window we can add storage to the created server instance.

EC2 Management Console

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

AWS Services Edit

Hasun nirodhara 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 4: Add Storage

Your instance will be launched with the following storage device settings. You can attach additional EBS volumes and instance store volumes to your instance, or edit the settings of the root volume. You can also attach additional EBS volumes after launching an instance, but not instance store volumes. [Learn more](#) about storage options in Amazon EC2.

Volume Type	Device	Snapshot	Size (GiB)	Volume Type	IOPS	Throughput (MB/s)	Delete on Termination	Encrypted
Root	/dev/sda1	snap-432bd8be	30	General Purpose SSD (GP2)	100 / 3000	N/A	<input checked="" type="checkbox"/>	Not Encrypted

[Add New Volume](#)

Free tier eligible customers can get up to 30 GB of EBS General Purpose (SSD) or Magnetic storage. [Learn more](#) about free usage tier eligibility and usage restrictions.

[Cancel](#) [Previous](#) [Review and Launch](#) [Next: Tag Instance](#)

Feedback English

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- A new Key pair can be created in this window but we will create it later.

EC2 Management Console

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

AWS Services Edit

Hasun nirodhara 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 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.

Key (127 characters maximum)	Value (255 characters maximum)
Name	

[Create Tag](#) (Up to 10 tags maximum)

[Cancel](#) [Previous](#) [Review and Launch](#) [Next: Configure Security Group](#)

Feedback English

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- In this window we can create new security group which specifies the security specification who can access the instance from where it can be accessed. For now keep the default values.

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:

Description:

Type	Protocol	Port Range	Source
RDP	TCP	3389	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.

[Feedback](#) [English](#) [Cancel](#) [Previous](#) [Review and Launch](#)

- In the next window we will have to create a authentication key to generate password when connecting to the windows server. Select to create a new key pair and provide the key value.

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
Microsoft Windows Server 2012 R2 Base - ami-26e72546
Free tier eligible
Root device type: ebs
Virtualization type: hvm

Instance Type

Instance Type	ECUs	VCPUs	Memory (GiB)
t2.micro	Variable	1	1

Security Groups

Security group name	Description
launch-wizard-1	launch-wizard-1 created 2016-07-26T11:51:42.967+05:30

Instance Details

Storage

Tags

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

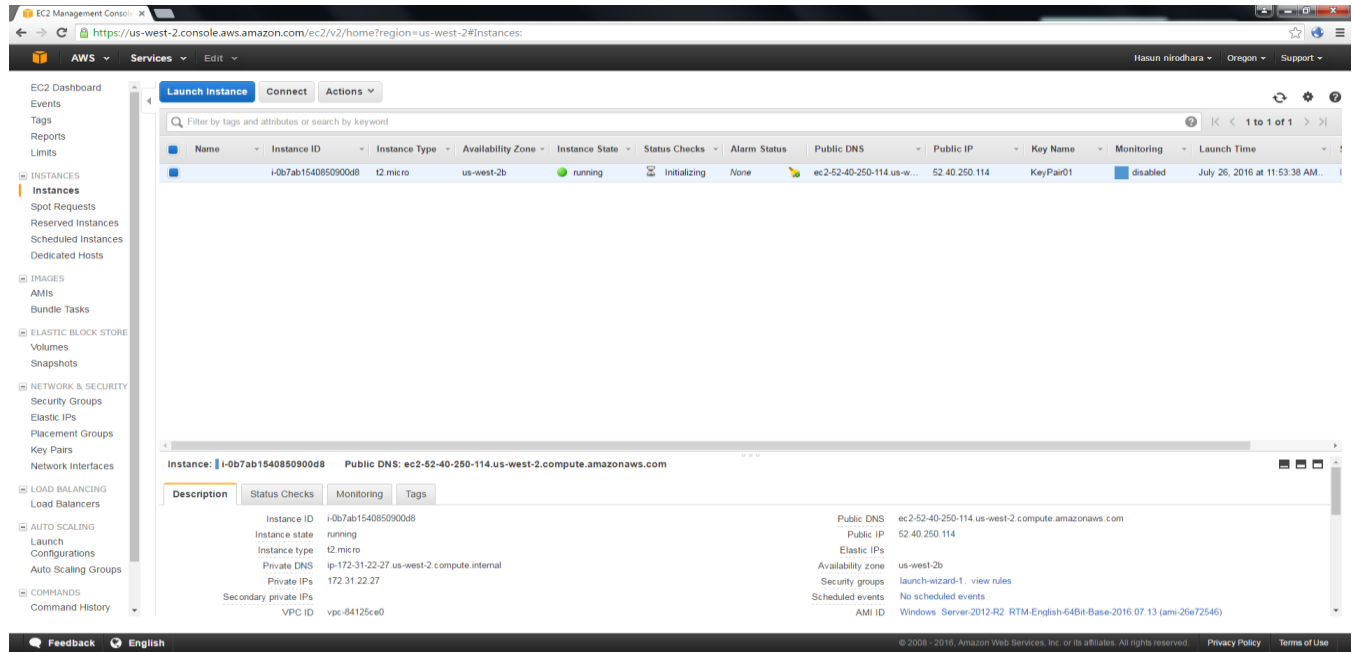
[Download Key Pair](#)

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](#)

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

- Now created instance will be shown in the instances tab.



- Now connect to the instance. Each time we are connecting to the instance we will have to obtain a password using the key pair that we created.
- Use the generated password and username as Administrator to connect to the server.

EC2 Management Console

https://us-west-2.console.aws.amazon.com/ec2/v2/home?region=us-west-2#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	Key Name	Monitoring	Launch Time
	i-0b7ab1540850900d8	t2.micro	us-west-2b	running	Initializing	None	ec2-52-40-250-114.us-w...	52.40.250.114	KeyPair01	disabled	July 26, 2016 at 11:53:38 AM

Connect To Your Instance

You can connect to your Windows instance using a remote desktop client of your choice, and by downloading and running the RDP shortcut file below:

[Download Remote Desktop File](#)

When prompted, connect to your instance using the following details:

Public DNS ec2-52-40-250-114.us-west-2.compute.amazonaws.com

User name Administrator

Password [Get Password](#)

If you've joined your instance to a directory, you can use your directory credentials to connect to your instance.

If you need any assistance connecting to your instance, please see our [connection documentation](#).

[Close](#)

Instance: i-0b7ab1540850900d8 Public DNS: ec2-52-40-250-114.us-west-2.compute.amazonaws.com

Description	Status Checks	Monitoring	Tags
Instance ID: i-0b7ab1540850900d8	Instance state: running	Public DNS: ec2-52-40-250-114.us-west-2.compute.amazonaws.com	
Instance type: t2.micro		Public IP: 52.40.250.114	
Private DNS: ip-172-31-22-27.us-west-2.compute.internal		Elastic IPs: us-west-2b	
Private IPs: 172.31.22.27		Availability zone: launch-wizard-1 view rules	
Secondary private IPs:		Security groups: No scheduled events	
VPC ID: vpc-84125ce0		AMI ID: Windows_Server-2012-R2_RTM-English-64Bit-Base-2016.07.13 (ami-26e72546)	

Feedback English

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EC2 Management Console

https://us-west-2.console.aws.amazon.com/ec2/v2/home?region=us-west-2#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	Key Name	Monitoring	Launch Time
	i-0b7ab1540850900d8	t2.micro	us-west-2b	running	Initializing	None	ec2-52-40-250-114.us-w...	52.40.250.114	KeyPair01	disabled	July 26, 2016 at 11:53:38 AM

Connect To Your Instance > Get Password

The following Key Pair was associated with this instance when it was created.

Key Name KeyPair01.pem

In order to retrieve your password you will need to specify the path of this Key Pair on your local machine:

Key Pair Path [Choose File](#) No file chosen

Or you can copy and paste the contents of the Key Pair below:

[Decrypt Password](#)

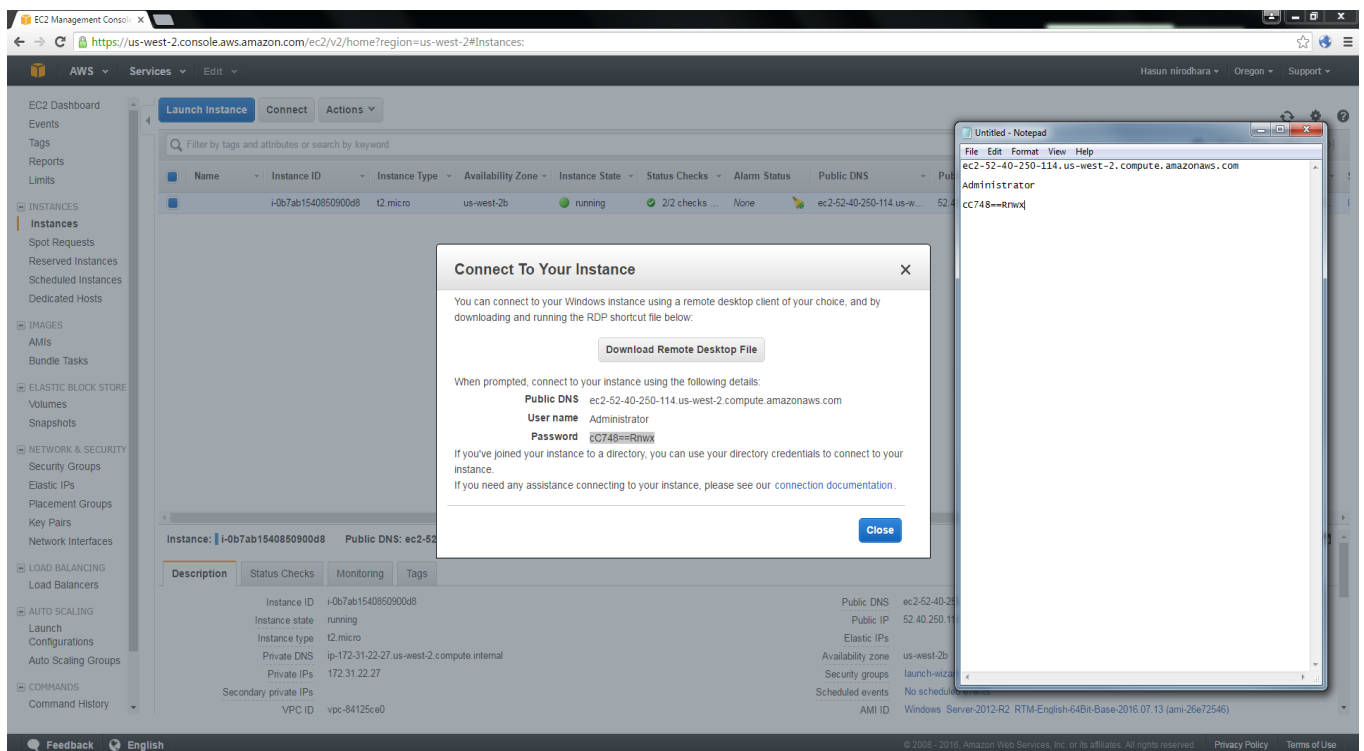
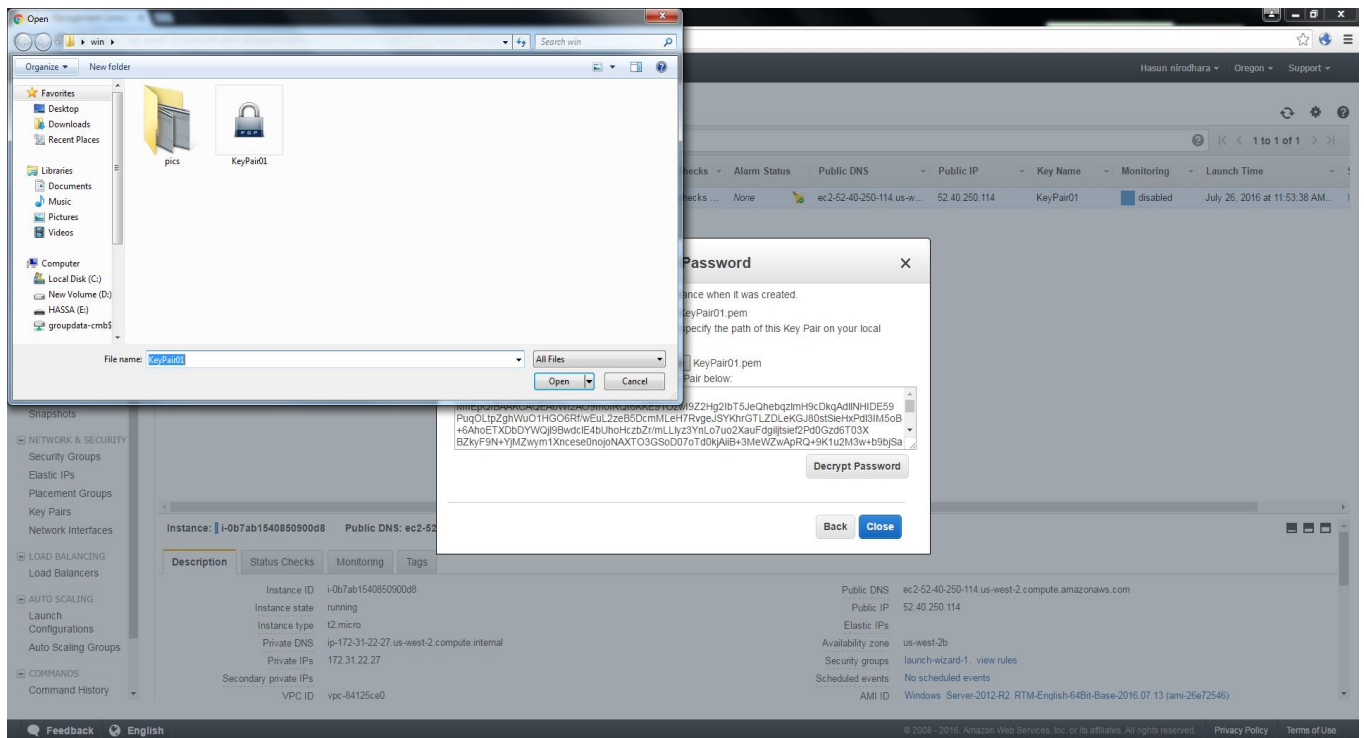
[Back](#) [Close](#)

Instance: i-0b7ab1540850900d8 Public DNS: ec2-52-40-250-114.us-west-2.compute.amazonaws.com

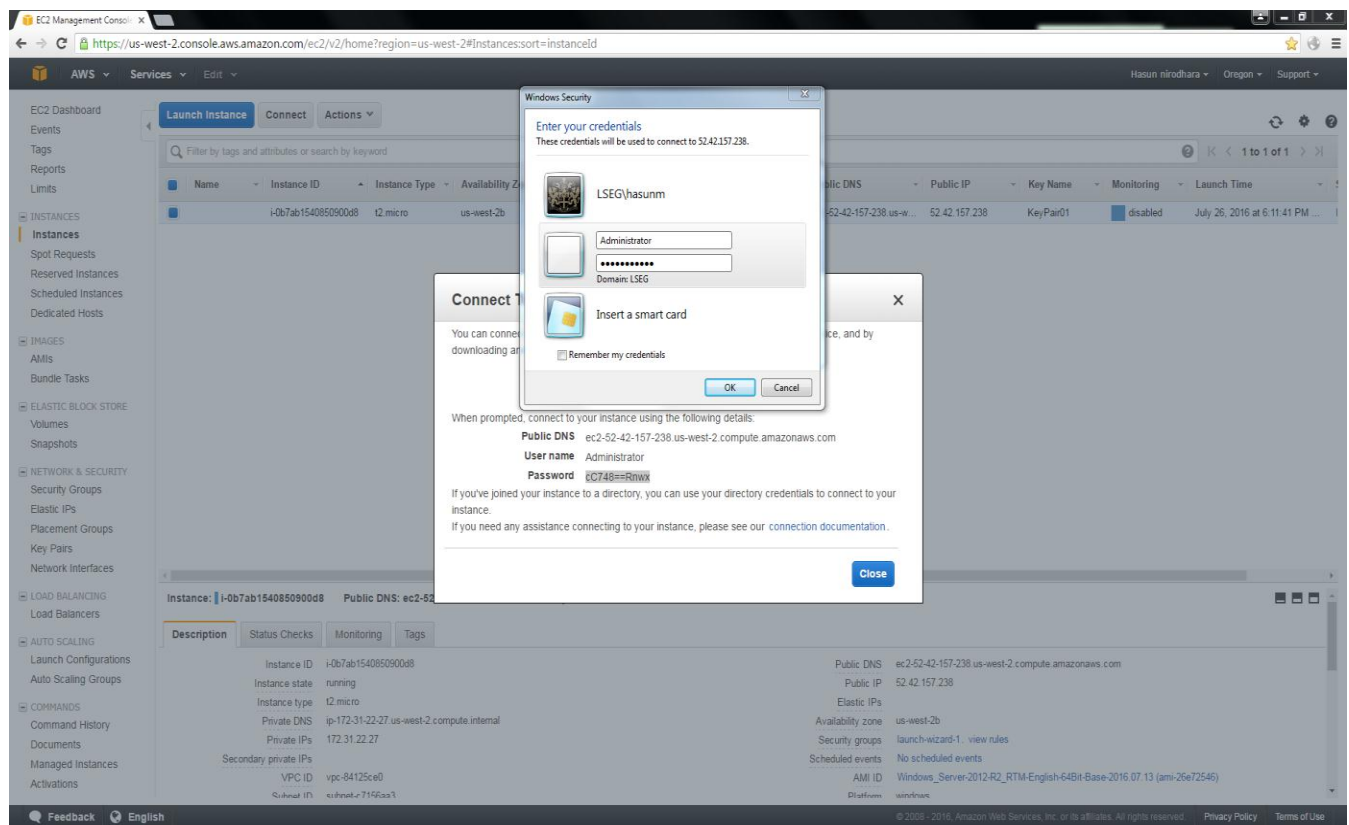
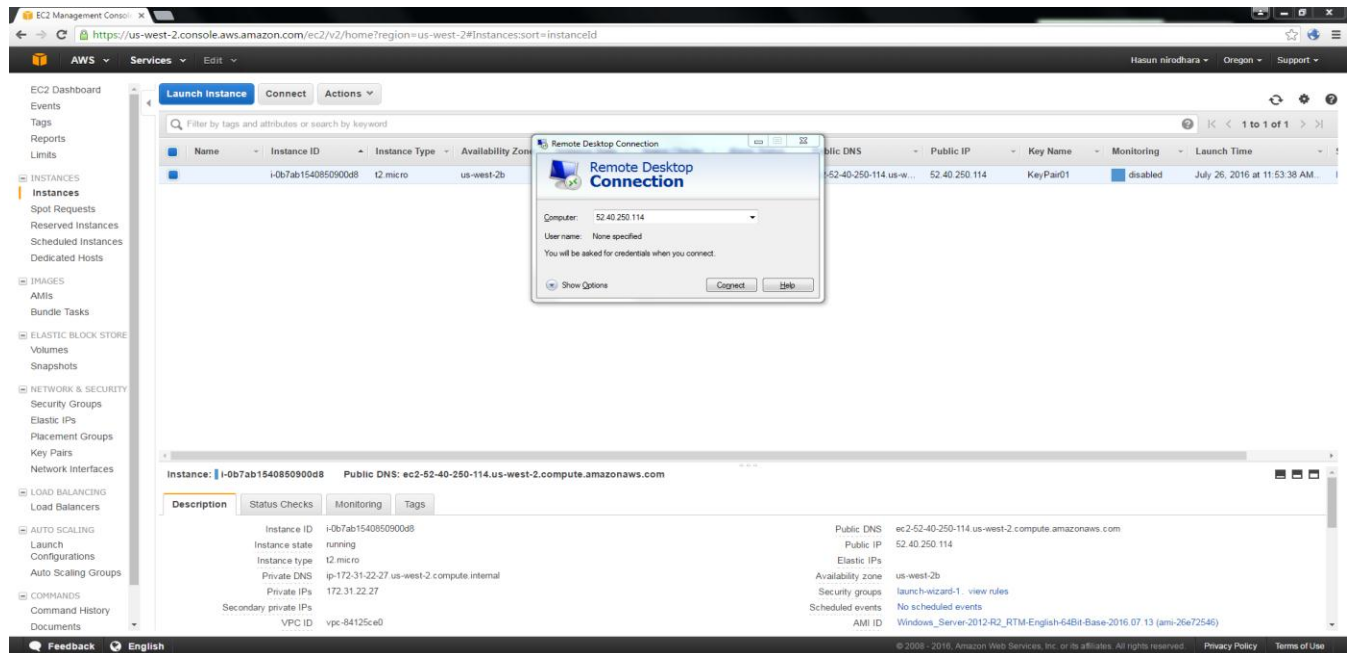
Description	Status Checks	Monitoring	Tags
Instance ID: i-0b7ab1540850900d8	Instance state: running	Public DNS: ec2-52-40-250-114.us-west-2.compute.amazonaws.com	
Instance type: t2.micro		Public IP: 52.40.250.114	
Private DNS: ip-172-31-22-27.us-west-2.compute.internal		Elastic IPs: us-west-2b	
Private IPs: 172.31.22.27		Availability zone: launch-wizard-1 view rules	
Secondary private IPs:		Security groups: No scheduled events	
VPC ID: vpc-84125ce0		AMI ID: Windows_Server-2012-R2_RTM-English-64Bit-Base-2016.07.13 (ami-26e72546)	

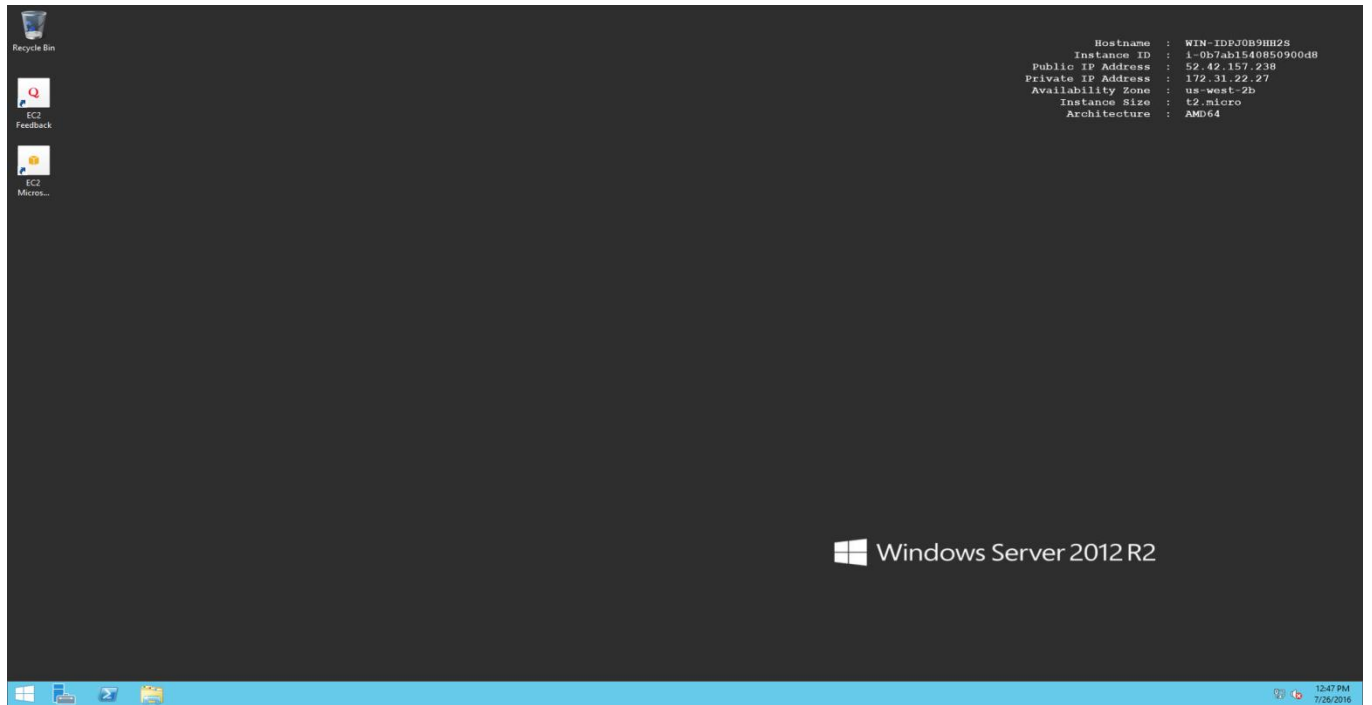
Feedback English

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- Take a remote desktop session using public IP address of the server. Provide the Username and the generated password to connect.

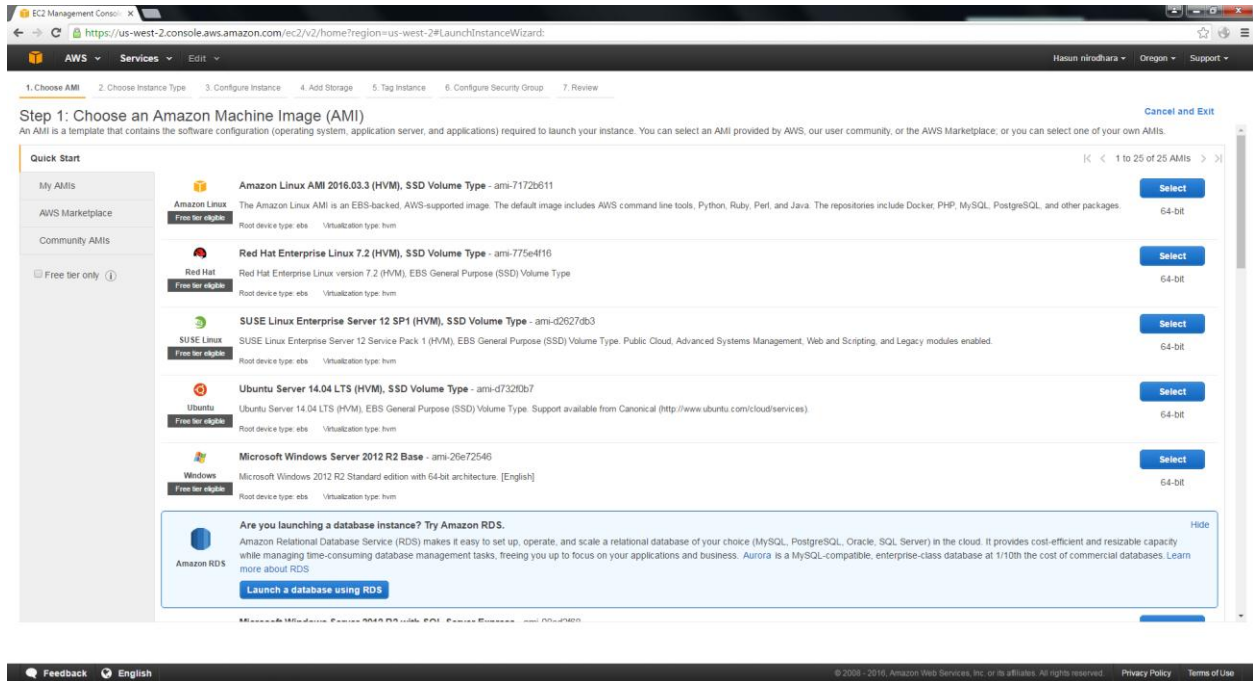




Task 02

Creating a Linux instance in AWS

- Logged in to the AWS console and in the instances tab, launch a new instance in the EC2 container.
- Select UBUNTU from the instances list.



- In the next window all the details of the instance will be displayed and we will have to create a key pair to generate a authentication key.

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](#)

Ubuntu Server 14.04 LTS (HVM), SSD Volume Type - ami-d732f0b7

Free tier eligible Ubuntu Server 14.04 LTS (HVM), EBS General Purpose (SSD) Volume Type. Support available from Canonical (<http://www.ubuntu.com/cloud/services>). Root Device Type: ebs Virtualization type: hvm

Instance Type [Edit instance type](#)

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

Security Groups [Edit security groups](#)

Security group name: launch-wizard-2
Description: launch-wizard-2 created 2016-07-26T18:25:06.251+05:30

Type	Protocol	Port Range	Source
SSH	TCP	22	0.0.0.0/0

Instance Details [Edit instance details](#)

Storage [Edit storage](#)

Tags [Edit tags](#)

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

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: hasunlinux
[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](#)

Feedback English

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hasunlinux.pem [Show all downloads](#)

- Make sure to download and keep the key pair at safer place.
- In the next window will display all the instances created.
- Connect to the linux instance and it will show the necessary steps to connect using ssh protocol.

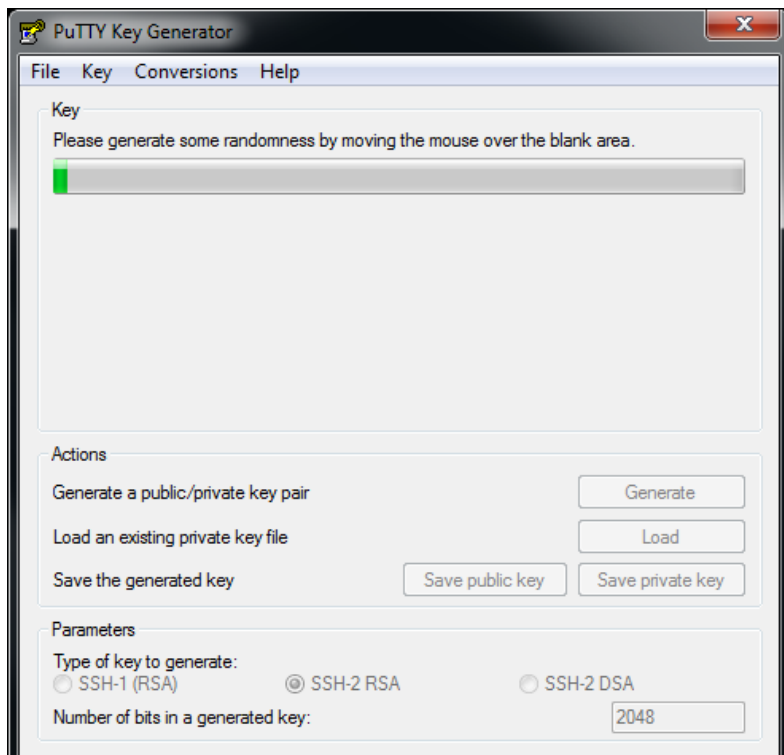
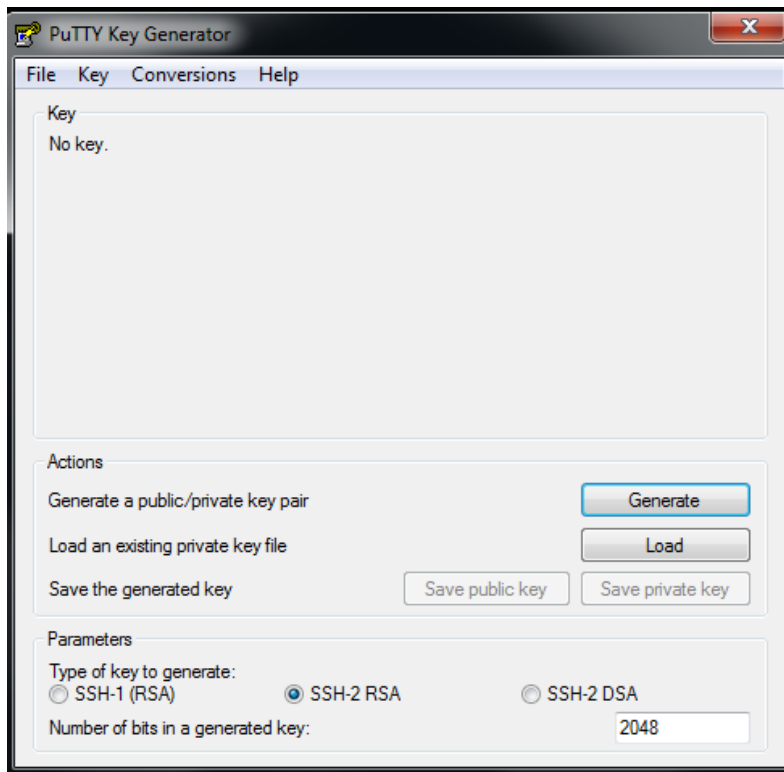
The top screenshot shows the AWS Management Console for EC2 instances in the us-west-2 region. The instance list shows two instances: one running (i-029e0e3e39f8b4f3) and one terminated (i-0b7ab1540850900d8). The details for the terminated instance are shown below the list.

Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Status	Public DNS	Public IP	Key Name	Monitoring	Launch Time
	i-029e0e3e39f8b4f3	t2.micro	us-west-2a	running	Initializing	None	ec2-52-42-233-170-us-w...	52.42.233.170	hasunlinux	disabled	July 26, 2016 at 6:30:36 PM ...
	i-0b7ab1540850900d8	t2.micro	us-west-2b	terminated	None	None			KeyPair01	disabled	July 26, 2016 at 6:11:41 PM ...

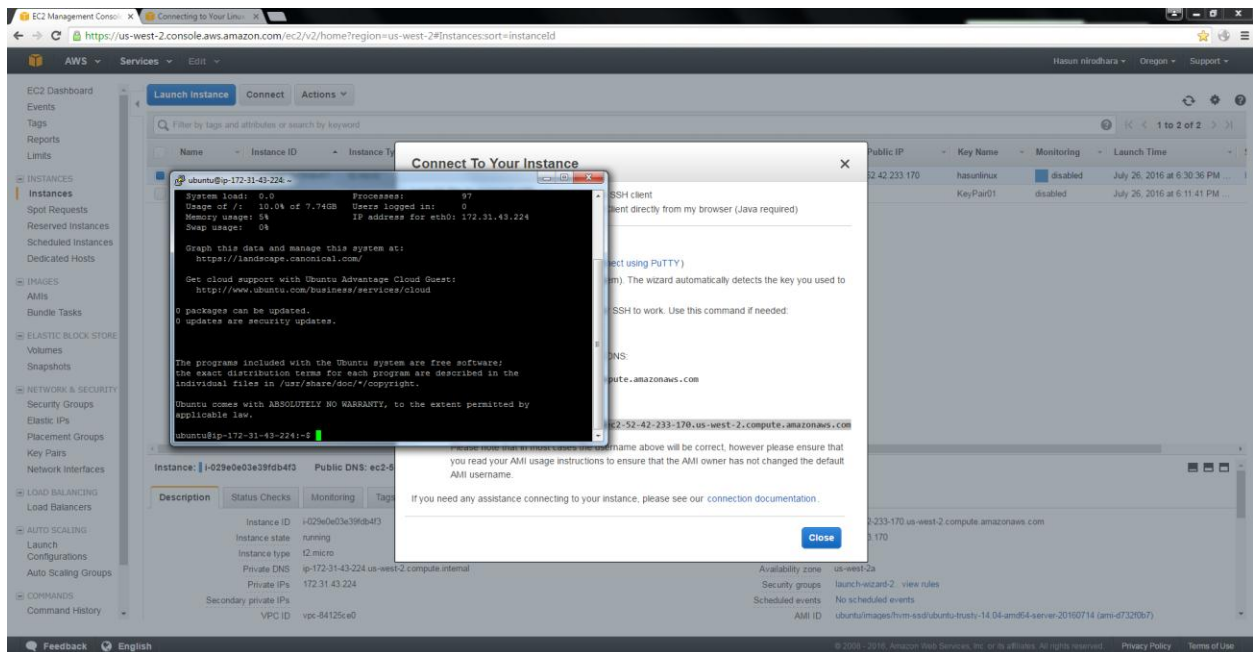
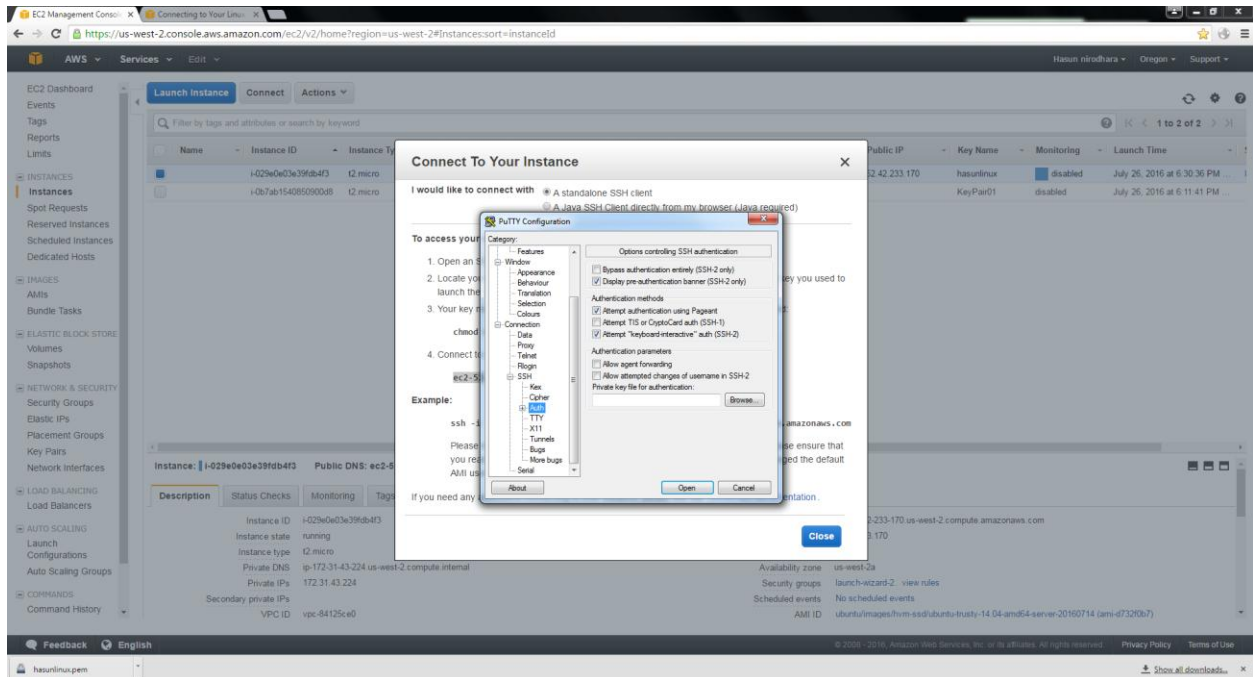
The bottom screenshot shows the 'Connect To Your Instance' dialog box. It provides instructions for connecting to the instance via SSH. The example command is:

```
ssh -i "hasunlinux.pem" ubuntu@ec2-52-42-233-170-us-west-2.compute.amazonaws.com
```

- Download *puttygen* and generate a private key using the key pair that we created earlier.
- Use that private key to connect using *ssh* in *putty*.



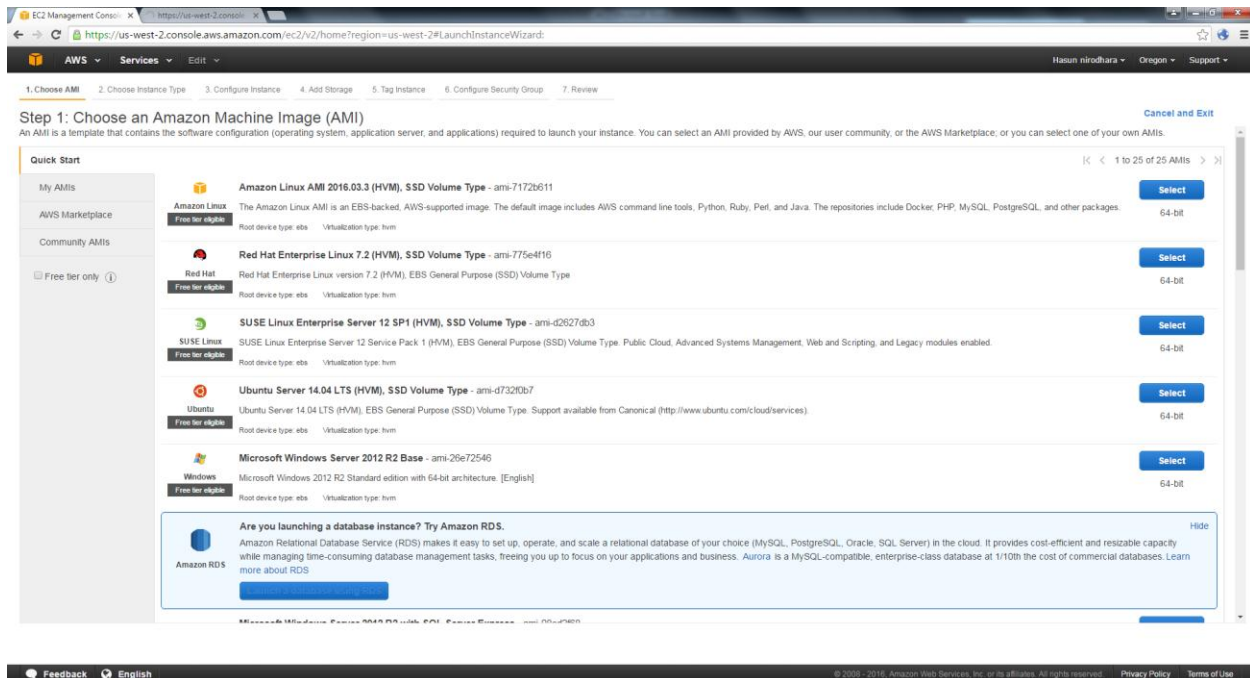
- Type the public IP address or the DNS address at the session ssh tab and browse and provide the private key at the authentication tab under ssh in putty.

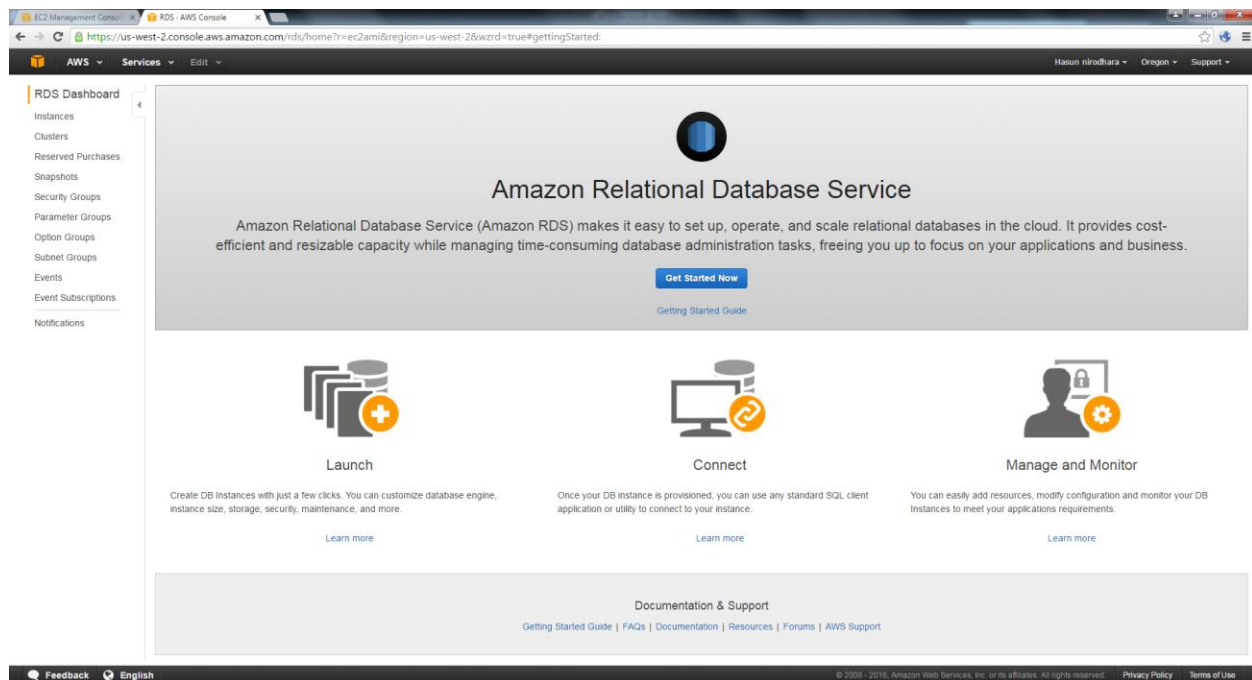


Task 03

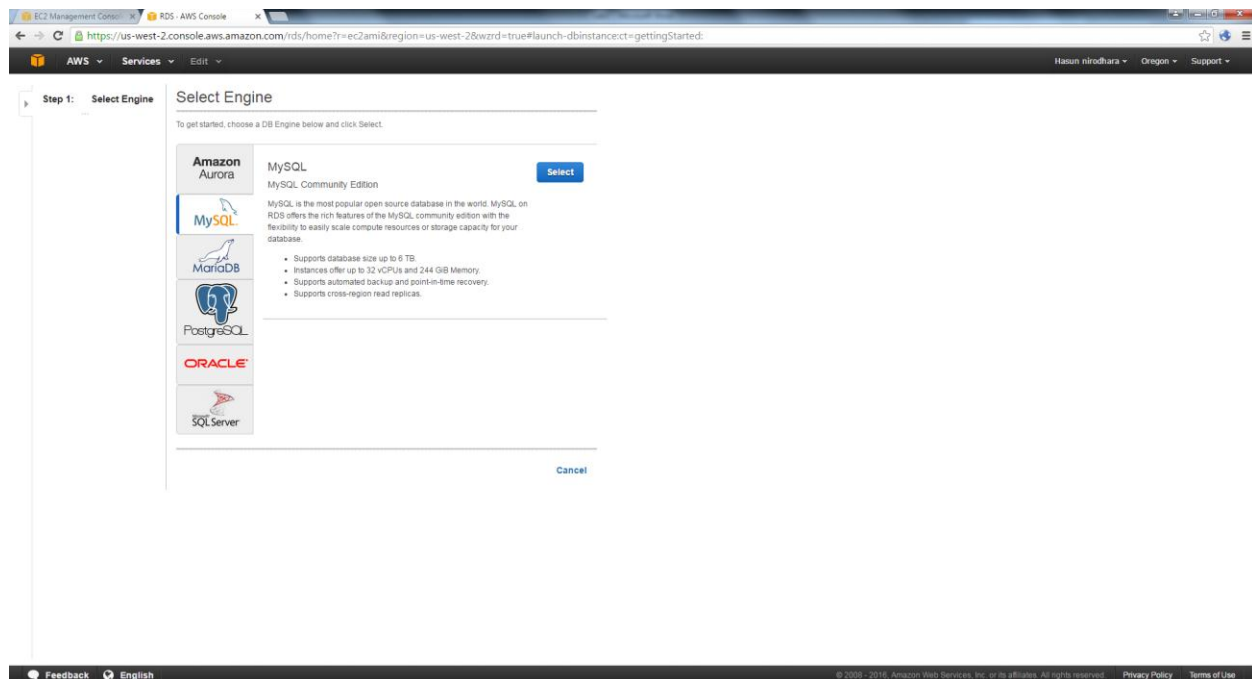
Create a MySQL Database using Relational Database Service option AWS

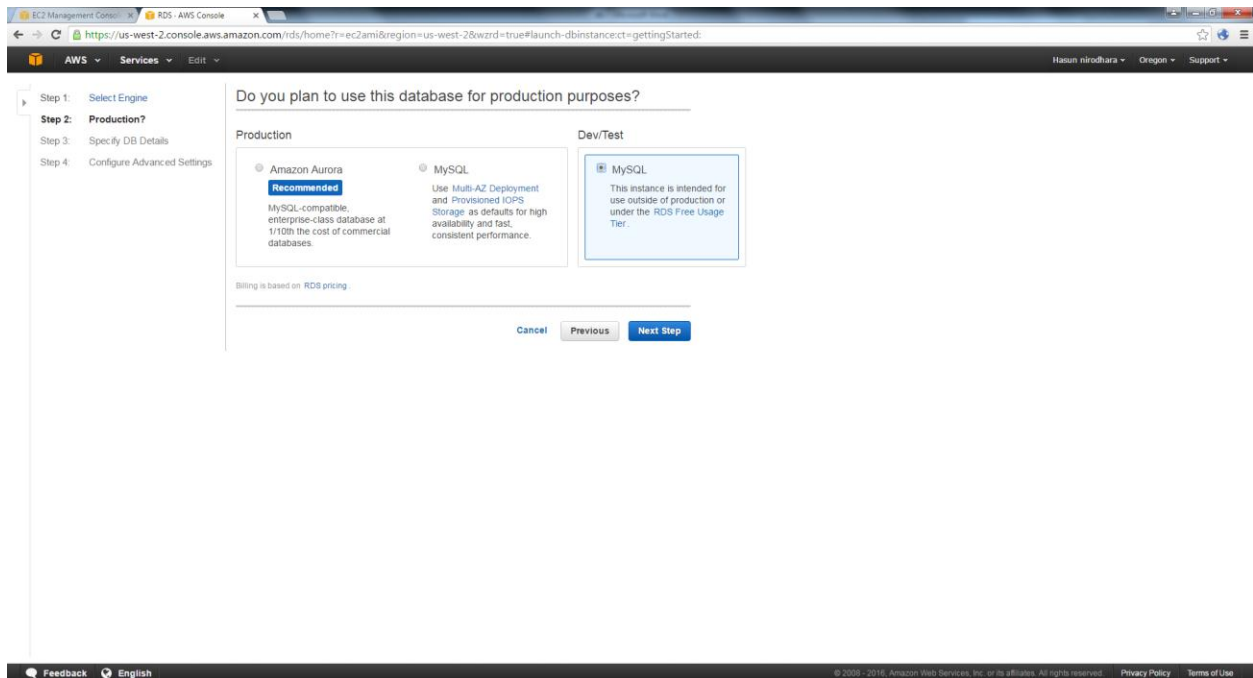
- Login to the AWS console.
- Select **Launch Instance**.
- Launch a RDS instance.





- Amazon RDS page will appear. Get started with a RDS.
- In the next page you can select the database version that you need to launch in the cloud environment. In this case, select MySQL and continue.





- Select MySQL free tier.
- In the next page we can configure the database hardware specifications. Provide the necessary specs as per the requirement.
- Make sure to provide a database name if you want to create a database with the instance creation.

Step 1: Select Engine
Step 2: Production?
Step 3: Specify DB Details
Step 4: Configure Advanced Settings

The following selections disqualify the instance from being eligible for the free tier:

- DB Instance Class

You will be charged normal RDS Prices. [Learn More.](#)

Estimate your monthly costs for the DB Instance using the RDS Instance Cost Calculator.

Specify DB Details

Free Tier

The Amazon RDS Free Tier provides a single db.t2.micro instance as well as up to 20 GB of storage, allowing new AWS customers to gain hands-on experience with Amazon RDS. [Learn more about the RDS Free Tier and the instance restrictions here.](#)

☐ Only show options that are eligible for RDS Free Tier

Instance Specifications

DB Engine: mysql
License Model: general-public-license
DB Engine Version: 5.6.27

[Review the Known Issues/Limitations to learn about potential compatibility issues with specific database versions.](#)

DB Instance Class: db.m1.small — 1 vCPU, 1.7 GiB RAM
Multi-AZ Deployment: No
Storage Type: Magnetic
Allocated Storage: 5 GB

Settings

DB Instance Identifier: west2-mysql-instance1
Master Username: hasun
Master Password:
Confirm Password:

Retype the value you specified for Master Password.

* Required

[Cancel](#) [Previous](#) [Next Step](#)

- In the next window advanced settings can be configured.
- Select the appropriate network and security profiles or it can be custom made for the connection areas.
- Make sure to put **YES** to publicly accessible box. Otherwise there won't be a public address to connect to the database remotely.

Step 1: Select Engine
Step 2: Production?
Step 3: Specify DB Details
Step 4: Configure Advanced Settings

Configure Advanced Settings

Network & Security

VPC: Default VPC (vpc-84125ce0)
Subnet Group: default
Publicly Accessible: Yes
Availability Zone: No Preference
VPC Security Group(s): Create new Security Group, default (VPC), launch-wizard-1 (VPC), launch-wizard-2 (VPC)

Database Options

Database Name: hasun
Note: if no database name is specified then no initial MySQL database will be created on this DB instance.
Database Port: 3306
DB Parameter Group: default.mysql5.6
Option Group: default.mysql5-6
Copy Tags To Snapshots: ☐
Enable Encryption: No

Backup

Please note that automated backups are currently supported for InnoDB storage engine only. If you are using MyISAM, refer to detail here.
Backup Retention Period: 7 days
Backup Window: No Preference

Maintenance

Auto Minor Version Upgrade: Yes

Specify a string of up to 64 alpha-numeric characters that define the name given to a database that Amazon RDS creates when it creates the DB instance, as in 'mydb'. If you do not specify a database name, Amazon RDS does not create a database when it creates the DB instance.

- Then you can view you created database instance.
- All the details and the performance can monitor using the RDS console. Logs generated regarding the changes are stored and can be viewed using instance action tab.

RDS Dashboard

Launch DB Instance Show Monitoring Instance Actions

Filter: All Instances Search DB Instances...

Engine	DB Instance	Status	CPU	Current Activity	Maintenance	Class	VPC	Multi-AZ	Replication Role	Encrypted
MySQL	west2-mysql-instance1	backing-up	0 Connections	None	db.m1.small	vpc-84125ce0	No	No	No	

Endpoint: west2-mysql-instance1.csi1f8b3h0aw.us-west-2.rds.amazonaws.com:3306 (authorized)

Alarms and Recent Events

TIME (UTC+5:30)	EVENT
Jul 27 9:55 AM	Backing up DB instance
Jul 27 9:54 AM	DB instance created

Monitoring

Metric	Current Value	Threshold	Last Hour
CPU	No Data		
Memory	1,220 MB		
Storage	4,540 MB		

Current Activity

Metric	Current Value	Last Hour
Read IOPS	4.89/sec	
Write IOPS	50.2/sec	
Swap Usage	0 MB	

Instance Actions Tags Logs

Connecting to the database .

- Using MySQL utilities we can get a command line interface connection to the data base. For the connection provided DNS address need to be used with the relevant port address. Instance address will be automatically transferred to the IP address of the database using DNS protocol.
- For a GUI administration, MySQL workbench can be used. Same as previous we need to create a instance session using the instance address and the port address. Connection credentials will be the username of the user.