

Introduction to Cloud Computing (CS 524)

(Lab Assignment 1)

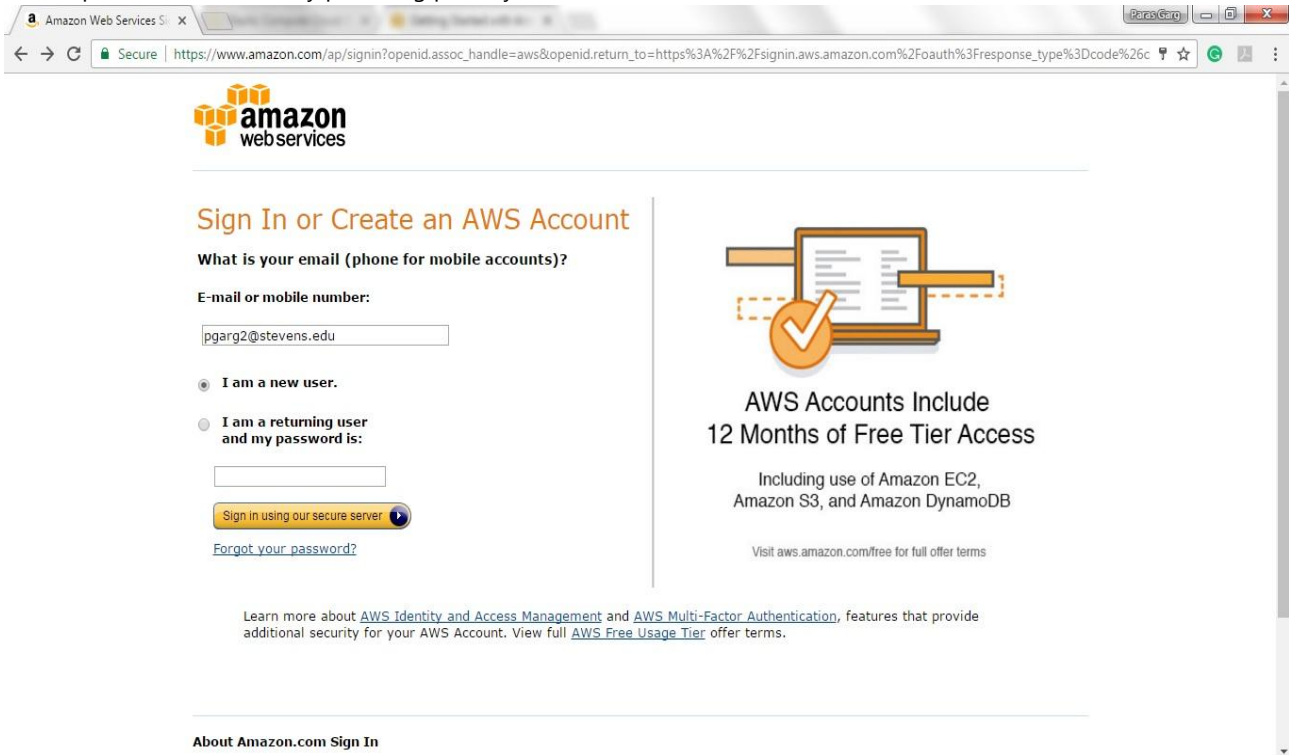
Prof. Igor Faynberg

Student Name: **Paras Garg**

Course Section: **CS 524-A**

Step for Creating an AWS account

- First step to create account by providing primary contact detail.



The screenshot shows the Amazon Web Services sign-in page. The browser address bar displays a secure URL. The page features the Amazon Web Services logo at the top left. The main heading is "Sign In or Create an AWS Account". Below this, a form asks for the user's email or mobile number, with "pgarg2@stevens.edu" entered. There are two radio button options: "I am a new user." (selected) and "I am a returning user and my password is:". A "Sign in using our secure server" button is present, along with a link for "Forgot your password?". To the right, a graphic of a laptop with a checkmark is shown, with text stating "AWS Accounts Include 12 Months of Free Tier Access" and listing included services: Amazon EC2, Amazon S3, and Amazon DynamoDB. A link to "Visit aws.amazon.com/free for full offer terms" is provided. At the bottom, there is a link to "Learn more about AWS Identity and Access Management and AWS Multi-Factor Authentication" and a link to "View full AWS Free Usage Tier offer terms". A footer link "About Amazon.com Sign In" is also visible.

Amazon Web Services

Sign In or Create an AWS Account

What is your email (phone for mobile accounts)?

E-mail or mobile number:

pgarg2@stevens.edu

☒ I am a new user.

☐ I am a returning user and my password is:

Sign in using our secure server

[Forgot your password?](#)

AWS Accounts Include 12 Months of Free Tier Access

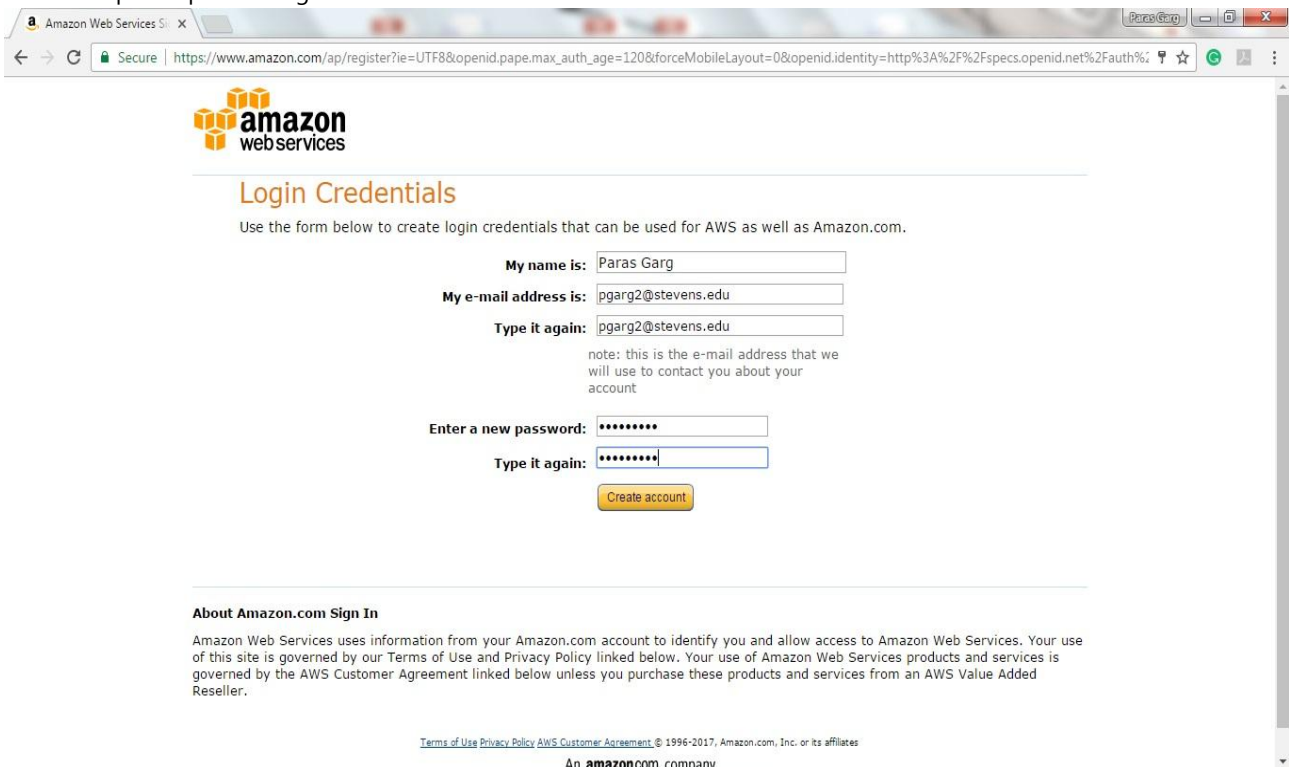
Including use of Amazon EC2, Amazon S3, and Amazon DynamoDB

[Visit aws.amazon.com/free for full offer terms](#)

Learn more about [AWS Identity and Access Management](#) and [AWS Multi-Factor Authentication](#), features that provide additional security for your AWS Account. View full [AWS Free Usage Tier](#) offer terms.

[About Amazon.com Sign In](#)

- Second step is to provide login credentials



The screenshot shows the Amazon Web Services login credentials page. The browser address bar displays a secure URL. The page features the Amazon Web Services logo at the top left. The main heading is "Login Credentials". Below this, a paragraph states: "Use the form below to create login credentials that can be used for AWS as well as Amazon.com." The form contains the following fields: "My name is:" with "Paras Garg" entered; "My e-mail address is:" with "pgarg2@stevens.edu" entered; "Type it again:" with "pgarg2@stevens.edu" entered. A note states: "note: this is the e-mail address that we will use to contact you about your account". Below these are two password fields: "Enter a new password:" and "Type it again:", both with masked characters. A "Create account" button is at the bottom. At the bottom of the page, there is a link to "About Amazon.com Sign In", a paragraph of legal text, and a footer with links to "Terms of Use", "Privacy Policy", and "AWS Customer Agreement", along with copyright information and the text "An amazon.com company".

Amazon Web Services

Login Credentials

Use the form below to create login credentials that can be used for AWS as well as Amazon.com.

My name is: Paras Garg

My e-mail address is: pgarg2@stevens.edu

Type it again: pgarg2@stevens.edu

note: this is the e-mail address that we will use to contact you about your account

Enter a new password:

Type it again:

Create account

[About Amazon.com Sign In](#)

Amazon Web Services uses information from your Amazon.com account to identify you and allow access to Amazon Web Services. Your use of this site is governed by our [Terms of Use](#) and [Privacy Policy](#) linked below. Your use of Amazon Web Services products and services is governed by the [AWS Customer Agreement](#) linked below unless you purchase these products and services from an AWS Value Added Reseller.

[Terms of Use](#) [Privacy Policy](#) [AWS Customer Agreement](#) © 1996-2017, Amazon.com, Inc. or its affiliates

An amazon.com company

- Third step is to provide full contact information

The screenshot shows the 'Contact Information' step of the AWS sign-up process. The browser address bar shows the URL: `https://portal.aws.amazon.com/billing/signup?redirect_url=https%3A%2F%2Faws.amazon.com%2Fregistration-confirmation%2Faccount`. The page features the Amazon Web Services logo and a 'Sign Out' link. Below the logo, there are radio buttons for 'Company Account' and 'Personal Account', with 'Personal Account' selected. A section titled '* Required Fields' contains the following input fields: 'Full Name*' (Paras Garg), 'Country*' (United States), 'Address*' (6604 McKinley Place, Apt 2), 'City*' (West New York), 'State / Province or Region*' (New Jersey), 'Postal Code*' (07093), and 'Phone Number*' (9178616967). There is a 'Security Check' section with a CAPTCHA image showing the characters 'pb n6 7 b' and a text input field containing 'pbn67b'. Below this is the 'AWS Customer Agreement' with a checked checkbox indicating agreement. At the bottom is a yellow 'Create Account and Continue' button.

- After contact information, we have to provide payment information.

The screenshot shows the 'Payment Information' step of the AWS sign-up process. The browser address bar shows the URL: `https://portal.aws.amazon.com/billing/signup?redirect_url=https%3A%2F%2Faws.amazon.com%2Fregistration-confirmation%2Fpaymentinformation`. The page features the Amazon Web Services logo and a 'Sign Out' link. A progress bar at the top shows five steps: 'Contact Information' (completed), 'Payment Information' (current), 'Identity Verification', 'Support Plan', and 'Confirmation'. Below the progress bar, a message states: 'Please enter your payment information below. You will be able to try a broad set of AWS products for free via the Free Tier. We will only bill your credit or debit card for usage that is not covered by our Free Tier.' This is followed by a link to 'Frequently Asked Questions'. A table titled 'AWS Free Tier Compute Products' lists the following details:

AWS Free Tier Compute Products	Amazon EC2	Amazon Lambda	Elastic Load Balancing
	750 hrs per month*	1,000,000 requests per month*	750 hrs per month*

Below the table is a link: [*View full offer details >](#). The 'Payment Information' section includes a 'Credit/Debit Card Number' field (masked as xxx-xxx-xxxx), an 'Expiration Date' field (xx/xx), a 'Cardholder's Name' field (PARAS GARG), and two radio buttons: 'Use my contact address' (selected) and 'Use a new address'. The selected address is '(6604 McKinley Place Apt 2 West New York New Jersey 07093 US)'. At the bottom is a yellow 'Continue' button.

- Step after payment set up is to verify the identity by getting one time password.

The screenshot shows the AWS Console - Signup page in a web browser. The URL is https://portal.aws.amazon.com/billing/signup?redirect_url=https%3A%2F%2Faws.amazon.com%2Fregistration-confirmation#/identityverification. The page title is "Amazon Web Services Sign Up". A progress bar at the top shows five steps: Contact Information, Payment Information, Identity Verification (current step), Support Plan, and Confirmation. The "Identity Verification" section contains the following text:

You will be called immediately by an automated system and prompted to enter the PIN number provided.

1. Provide a telephone number ✓

2. Call in progress

Please follow the instructions on the telephone and key in the following Personal Identification Number (PIN) on your telephone when prompted.

PIN: 1284

If you have not yet received a call at the number indicated above please wait. This page will automatically update with what you need to do next.

3. Identity verification complete

- Next step is to select the support plan.

The screenshot shows the AWS Console - Signup page in a web browser. The URL is https://portal.aws.amazon.com/billing/signup?redirect_url=https%3A%2F%2Faws.amazon.com%2Fregistration-confirmation#/support. The page title is "Amazon Web Services Sign Up". A progress bar at the top shows five steps: Contact Information, Payment Information, Identity Verification, Support Plan (current step), and Confirmation. The "Support Plan" section contains the following text:

AWS Support offers a selection of plans to meet your needs. All plans provide 24x7 access to customer service, AWS documentation, whitepapers, and support forums. For access to technical support and additional resources to help you plan, deploy, and optimize your AWS environment, we recommend selecting a support plan that best aligns with your AWS usage.

Please Select One

- ☒ **Basic**

Description: Customer Service for account and billing questions and access to the AWS Community Forums.

Price: Included
- ☐ **Developer**

Use case: Experimenting with AWS

Description: One primary contact may ask technical questions through Support Center and get a response within 12-24 hours during local business hours.

Price: Starts at \$29/month (scales based on usage)
- ☐ **Business**

Use case: Production use of AWS

Description: 24x7 support by phone and chat, 1-hour response to urgent support cases, and help with common third-party software. Full access to AWS Trusted Advisor for optimizing your AWS infrastructure, and access to the AWS Support API for automating your support cases and retrieving Trusted Advisor results.

Price: Starts at \$100/month (scales based on usage)
- ☐ **Enterprise**

Use case: Mission-critical use of AWS

Description: All the features of the Business support plan, plus an assigned Technical Account Manager

- After choosing plan, the final step is the confirmation.

Registration Confirmation X

Secure | <https://aws.amazon.com/registration-confirmation/>

Menu **amazon** web services Products Solutions Pricing Software Support More English My Account Complete Sign Up

Personalize Your AWS Experience

Customize your experience by sharing your profile and use case.

What is your primary Use Case? Development & Test

What is your Job Role? Student

What Industry are you in? Software & Internet

What type of Organization are you in? Education

What are you using AWS for? Personal Use

Submit

Try AWS with a 10-Minute Tutorial

Launch a Linux Virtual Machine Store Your Files in the Cloud Launch a WordPress Website Launch a Web Application

- After creating account, we have to sign in to access the resources.

Amazon Web Services Sign In or Create an AWS Account

What is your email (phone for mobile accounts)?

E-mail or mobile number: pgarg2@stevens.edu

☐ I am a new user.

☒ I am a returning user and my password is:

Sign in using our secure server

[Forgot your password?](#)

Now Available: Amazon EBS Elastic Volumes

Dynamically modify capacity, performance, and volume types

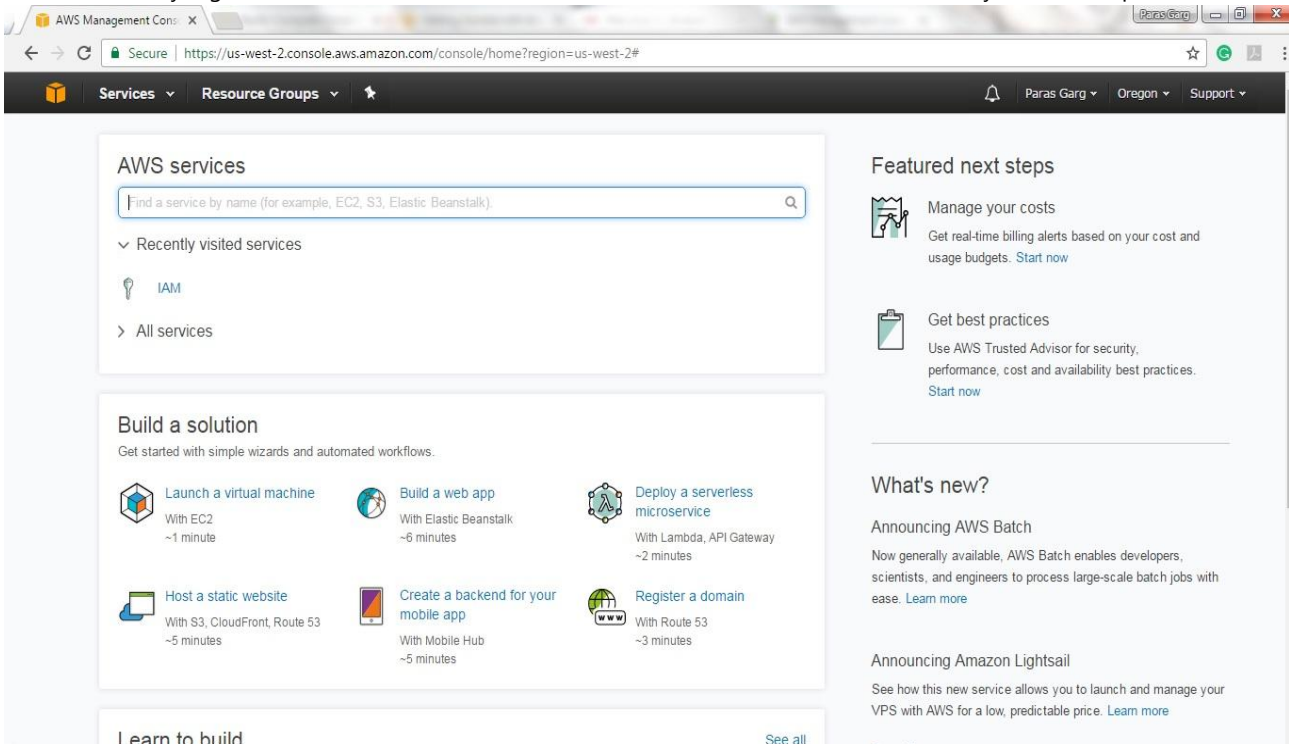
[Learn More](#)

Learn more about [AWS Identity and Access Management](#) and [AWS Multi-Factor Authentication](#), features that provide additional security for your AWS Account. View full [AWS Free Usage Tier](#) offer terms.

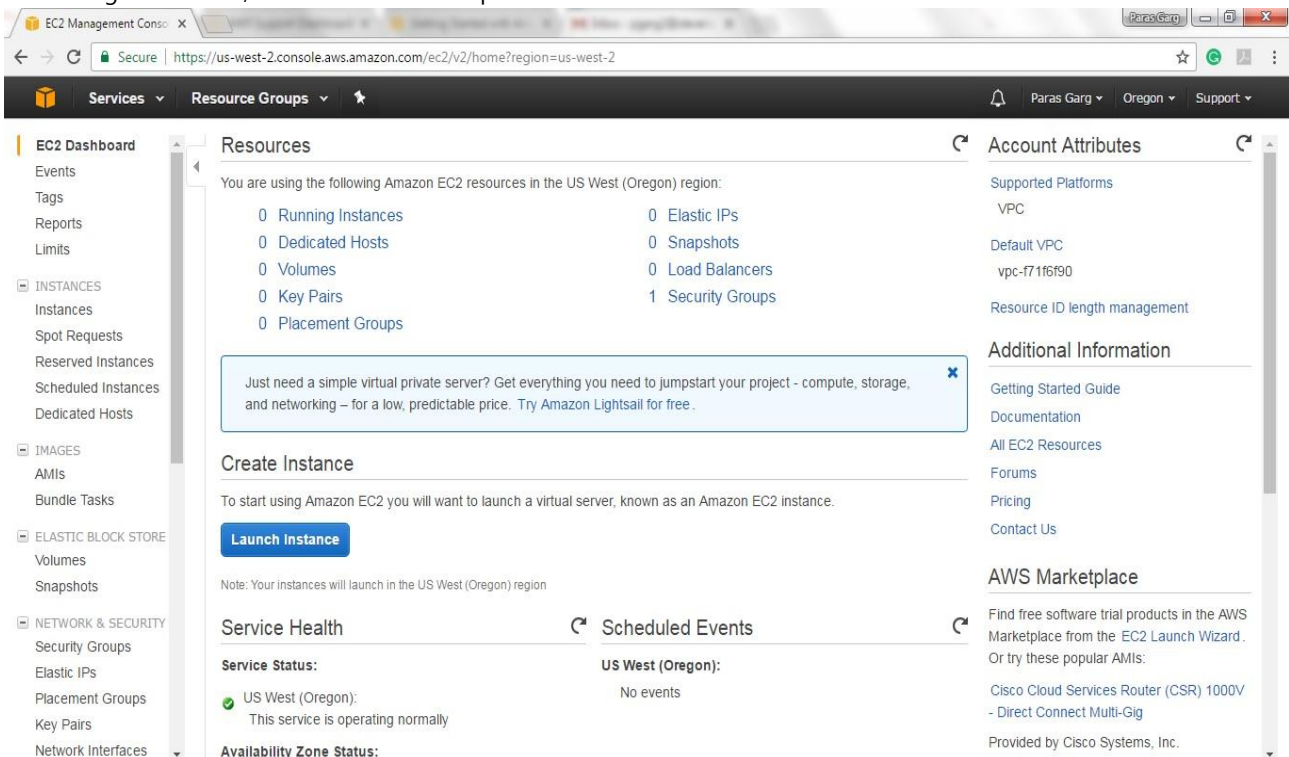
About Amazon.com Sign In

Step for Creating and Launching AWS instance

- After successfully login into AWS console, we would land on the user dashboard from where you find all options.



- On clicking EC2 service, EC2 Dashboard will open. Now we have to click on "Launch Instance" under Create Instance tab.



- After Launching Instance, first, we have to choose an Amazon Machine Image (AMI). Selecting Amazon Linux AMI (64-bit).

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 2016.09.1 (HVM), SSD Volume Type - ami-f173cc91 **Select**

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 7.3 (HVM), SSD Volume Type - ami-6f68cf0f **Select**

Red Hat Enterprise Linux version 7.3 (HVM), EBS General Purpose (SSD) Volume Type

Root device type: ebs Virtualization type: hvm

SUSE Linux Enterprise Server 12 SP2 (HVM), SSD Volume Type - ami-e4a30084 **Select**

SUSE Linux Enterprise Server 12 Service Pack 2 (HVM), EBS General Purpose (SSD) Volume Type. Public Cloud, Advanced Systems Management, Web and Scripting, and Legacy modules enabled.

Root device type: ebs Virtualization type: hvm

Ubuntu Server 16.04 LTS (HVM), SSD Volume Type - ami-a58d0dc5 **Select**

- After selecting AMI, we have the options to choose an Instance Type. Selecting **t2.micro** (free tier eligibility).

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 ⓘ	IPv6 Support ⓘ
<input type="checkbox"/>	General purpose	t2.nano	1	0.5	EBS only	-	Low to Moderate	Yes
<input checked="" type="checkbox"/>	General purpose	t2.micro Free tier eligible	1	1	EBS only	-	Low to Moderate	Yes
<input type="checkbox"/>	General purpose	t2.small	1	2	EBS only	-	Low to Moderate	Yes
<input type="checkbox"/>	General purpose	t2.medium	2	4	EBS only	-	Low to Moderate	Yes
<input type="checkbox"/>	General purpose	t2.large	2	8	EBS only	-	Low to Moderate	Yes
<input type="checkbox"/>	General purpose	t2.xlarge	4	16	EBS only	-	Moderate	Yes

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

- As we have selected free tier instance type, we would jump to final step to Review Instance Launch.

Step 7: Review Instance Launch

▼ AMI Details Edit AMI

Amazon Linux AMI 2016.09.1 (HVM), SSD Volume Type - ami-f173cc91

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

▼ Security Groups Edit security groups

Security group name launch-wizard-1

Description launch-wizard-1 created 2017-03-07T13:57:52.664-05:00

Type	Protocol	Port Range	Source
SSH	TCP	22	0.0.0.0/0

Cancel Previous Launch

- After reviewing, we have to create a new Key-Pair and have to download it into our local machine.

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

☒ Create a new key pair

Key pair name ParagGarg_AWS

Download Key Pair

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

☒ Create a new key pair

Key pair name ParagGarg_AWS

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

- After creating key-pair, our instance is ready to launch and we can view it by clicking View Instance.

Launch Status

Your instances are now launching

The following instance launches have been initiated: i-03e38b50eafa821b7 View launch log

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 Linux instance
- Learn about AWS Free Usage Tier
- Amazon EC2: User Guide
- Amazon EC2: Discussion Forum

While your instances are launching you can also

- Create status check alarms to be notified when these instances fail status checks. (Additional charges may apply)
- Create and attach additional EBS volumes (Additional charges may apply)
- Manage security groups

View Instances

Feedback English

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- Now, we can view description about your instance and other modules. Now viewing Instances and its description.

The screenshot shows the AWS Management Console interface for the 'us-west-2' region. The left sidebar contains navigation links for EC2 Dashboard, Events, Tags, Reports, Limits, INSTANCES, IMAGES, ELASTIC BLOCK STORE, and NETWORK & SECURITY. The main content area displays a table of EC2 instances. The instance 'i-03e38b50eafa821b7' is selected, and its details are shown in the 'Description' tab. The instance is a 't2.micro' type, running in the 'us-west-2a' availability zone. It has a public IP address of '52.27.159.54' and a public DNS name of 'ec2-52-27-159-54.us-west-2.compute.amazonaws.com'. Other details include the VPC ID 'vpc-f71f6f90', Subnet ID 'subnet-0334bd64', and the IAM role 'ParasGarg_AWS'.

Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Status	Public DNS (IPv4)	IPv4
	i-03e38b50eafa821b7	t2.micro	us-west-2a	running	Initializing	None	ec2-52-27-159-54.us-west-2.compute.amazonaws.com	52.27.159.54

Instance: i-03e38b50eafa821b7 Public DNS: ec2-52-27-159-54.us-west-2.compute.amazonaws.com

Property	Value	Property	Value
Instance ID	i-03e38b50eafa821b7	Public DNS (IPv4)	ec2-52-27-159-54.us-west-2.compute.amazonaws.com
Instance state	running	IPv4 Public IP	52.27.159.54
Instance type	t2.micro	IPv6 IPs	-
Elastic IPs	-	Private DNS	ip-172-31-26-87.us-west-2.compute.internal
Availability zone	us-west-2a	Private IPs	172.31.26.87
Security groups	launch-wizard-1. view inbound rules	Secondary private IPs	-
Scheduled events	No scheduled events	VPC ID	vpc-f71f6f90
AMI ID	amzn-ami-hvm-2016.09.1.20170119-x86_64-gp2 (ami-f173cc91)	Subnet ID	subnet-0334bd64
Platform	-	Network interfaces	eth0
IAM role	-	Source/dest. check	True
Key pair name	ParasGarg_AWS		

- Here, we are checking Security Group and its description.

The screenshot shows the AWS Management Console interface for the 'us-west-2' region. The left sidebar contains navigation links for EC2 Dashboard, Events, Tags, Reports, Limits, INSTANCES, IMAGES, ELASTIC BLOCK STORE, and NETWORK & SECURITY. The main content area displays a table of Security Groups. The Security Group 'sg-3b567f43' is selected, and its details are shown in the 'Description' tab. The Security Group is named 'launch-wizard-1' and is associated with the VPC 'vpc-f71f6f90'. The description is 'launch-wizard-1 created 2017-03-07T13:57:52.664-05:00'.

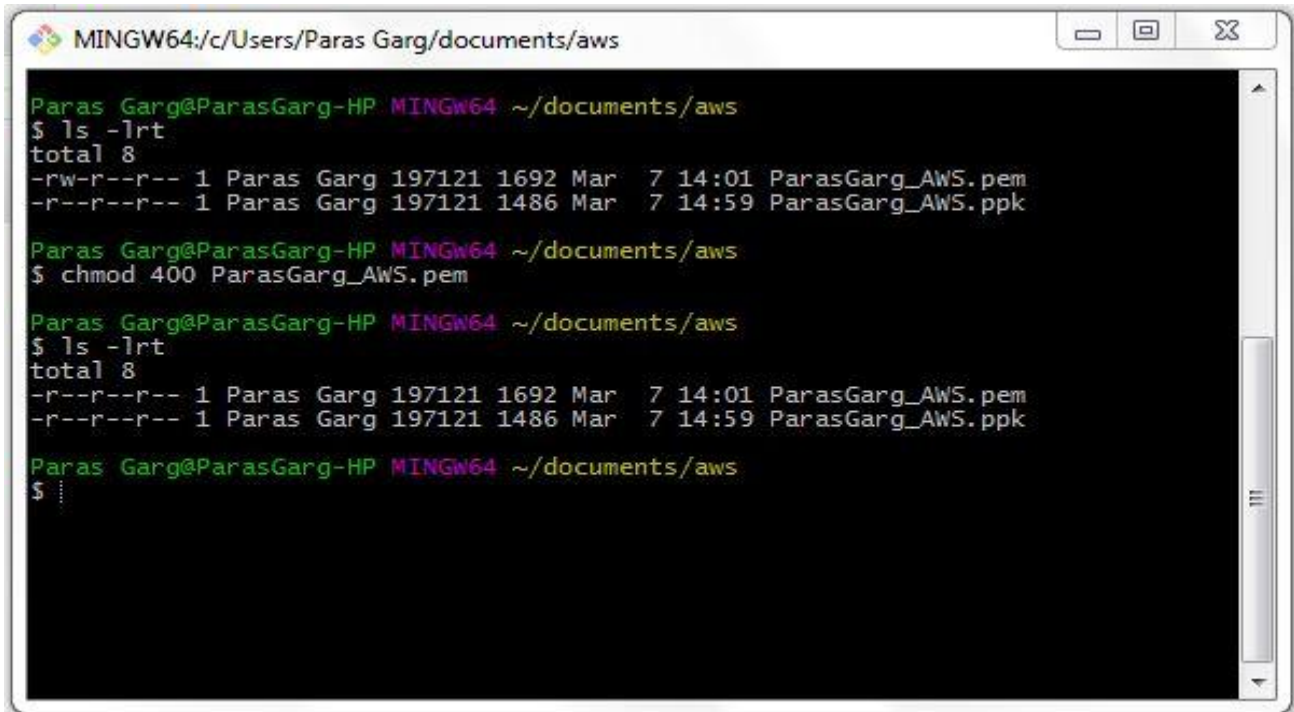
Name	Group ID	Group Name	VPC ID	Description
	sg-0c7f5674	default	vpc-f71f6f90	default VPC security group
	sg-3b567f43	launch-wizard-1	vpc-f71f6f90	launch-wizard-1 created 2017-03-07T13:57:52.664-05:00

Security Group: sg-3b567f43

Property	Value	Property	Value
Group name	launch-wizard-1	Group description	launch-wizard-1 created 2017-03-07T13:57:52.664-05:00
Group ID	sg-3b567f43	VPC ID	vpc-f71f6f90

Step for Accessing AWS instance

- Ensuring read write permission on instance by executing below command
\$ chmod 400 ParasGarg_AWS.pem



```
MINGW64:/c:/Users/Paras Garg/documents/aws

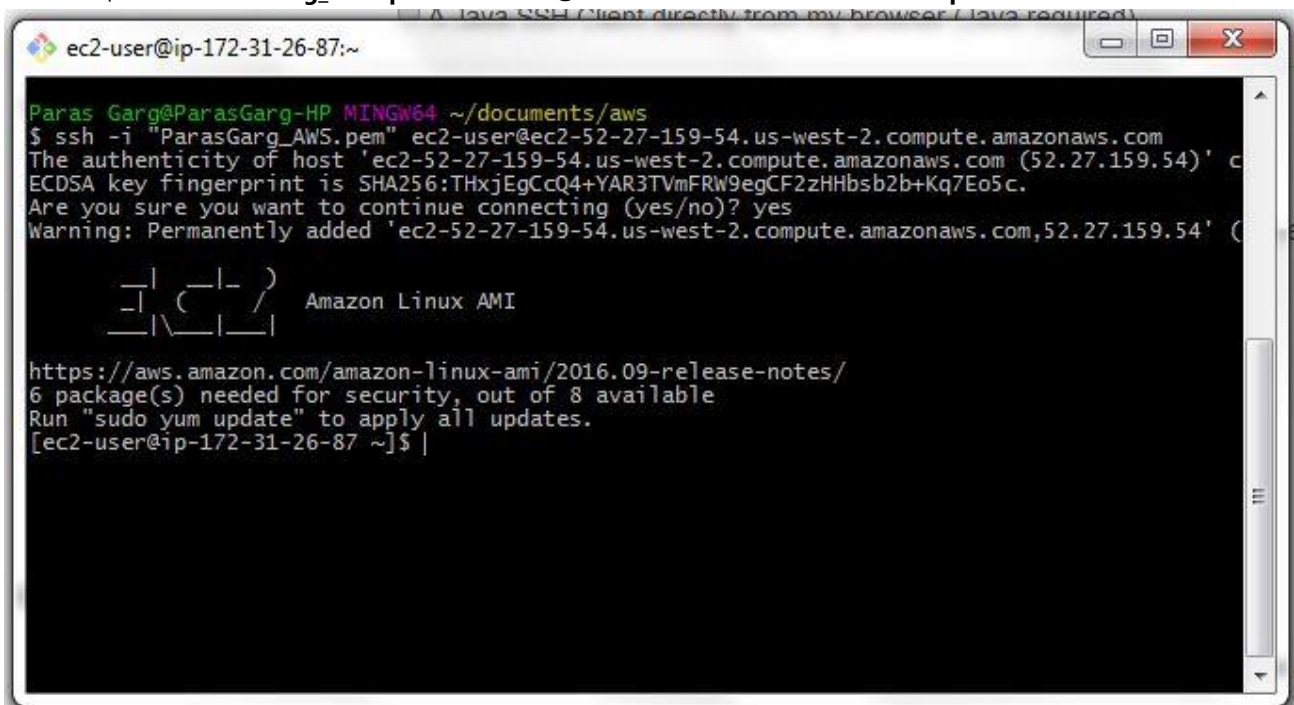
Paras Garg@ParasGarg-HP MINGW64 ~/documents/aws
$ ls -lrt
total 8
-rw-r--r-- 1 Paras Garg 197121 1692 Mar  7 14:01 ParasGarg_AWS.pem
-r--r--r-- 1 Paras Garg 197121 1486 Mar  7 14:59 ParasGarg_AWS.ppk

Paras Garg@ParasGarg-HP MINGW64 ~/documents/aws
$ chmod 400 ParasGarg_AWS.pem

Paras Garg@ParasGarg-HP MINGW64 ~/documents/aws
$ ls -lrt
total 8
-r--r--r-- 1 Paras Garg 197121 1692 Mar  7 14:01 ParasGarg_AWS.pem
-r--r--r-- 1 Paras Garg 197121 1486 Mar  7 14:59 ParasGarg_AWS.ppk

Paras Garg@ParasGarg-HP MINGW64 ~/documents/aws
$
```

- Establishing connection with EC2 Instance by executing below command
\$ ssh -i "ParasGarg_AWS.pem" ec2-user@ec2-52-27-159-54.us-west-2.compute.amazonaws.com



```
ec2-user@ip-172-31-26-87:~

Paras Garg@ParasGarg-HP MINGW64 ~/documents/aws
$ ssh -i "ParasGarg_AWS.pem" ec2-user@ec2-52-27-159-54.us-west-2.compute.amazonaws.com
The authenticity of host 'ec2-52-27-159-54.us-west-2.compute.amazonaws.com (52.27.159.54)' c
ECDSA key fingerprint is SHA256:THxjEgCcQ4+YAR3TVmFRW9egCF2zHHbsb2b+Kq7Eo5c.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added 'ec2-52-27-159-54.us-west-2.compute.amazonaws.com,52.27.159.54' (

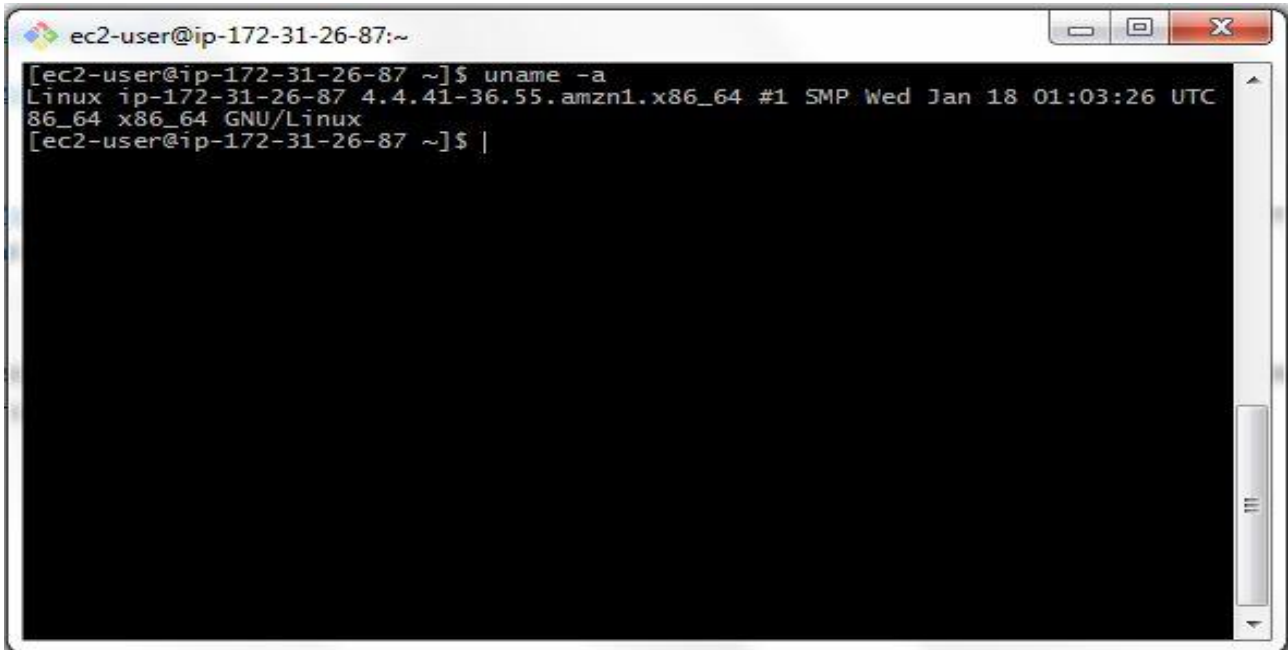
  _ | _ | _ |
 _ | ( _ | _ |
 _ | \ _ | _ |

Amazon Linux AMI

https://aws.amazon.com/amazon-linux-ami/2016.09-release-notes/
6 package(s) needed for security, out of 8 available
Run "sudo yum update" to apply all updates.
[ec2-user@ip-172-31-26-87 ~]$
```

AWS instance Commands

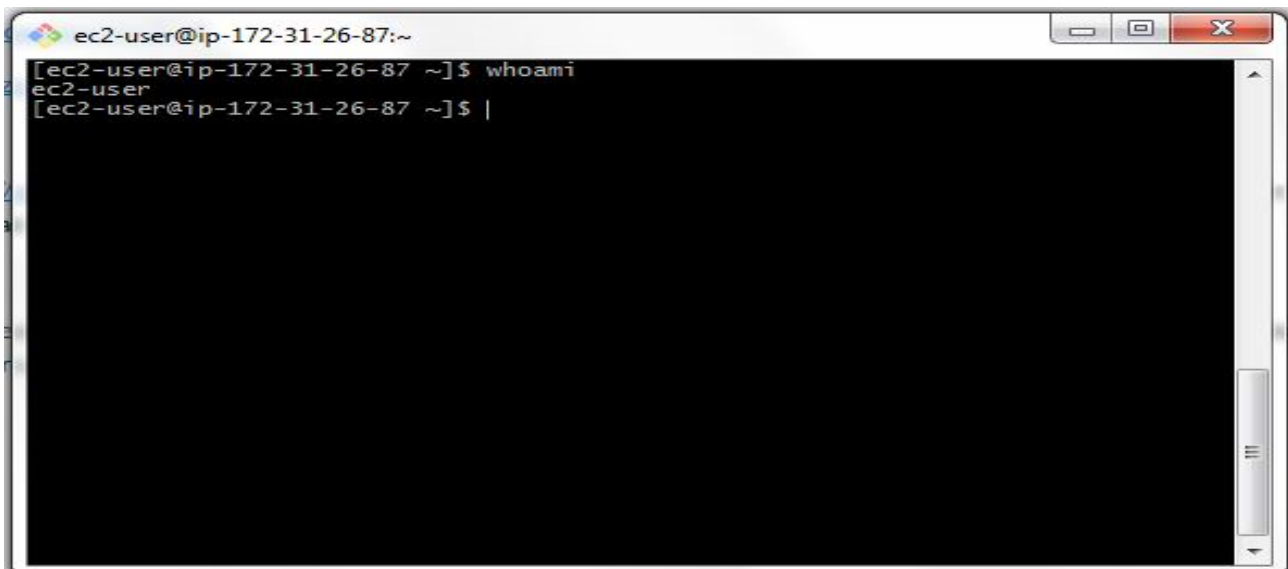
- **uname -a**



```
ec2-user@ip-172-31-26-87:~  
[ec2-user@ip-172-31-26-87 ~]$ uname -a  
Linux ip-172-31-26-87 4.4.41-36.55.amzn1.x86_64 #1 SMP Wed Jan 18 01:03:26 UTC  
86_64 x86_64 GNU/Linux  
[ec2-user@ip-172-31-26-87 ~]$ |
```

- Print information about the current system
- Print certain system information. If no OPTION is specified, **uname** assumes the -s option.
 - a, --all print all information, in the following order, except omit -p and -i if unknown:
 - s, --kernel-name print the kernel name
 - n, --nodename print the network node hostname
 - r, --kernel-release print the kernel release
 - v, --kernel-version print the kernel version
 - m, --machine print the machine hardware name
 - p, --processor print the processor type or "unknown"
 - i, --hardware-platform print the hardware platform or "unknown"
 - o, --operating-system print the operating system

- **whoami**



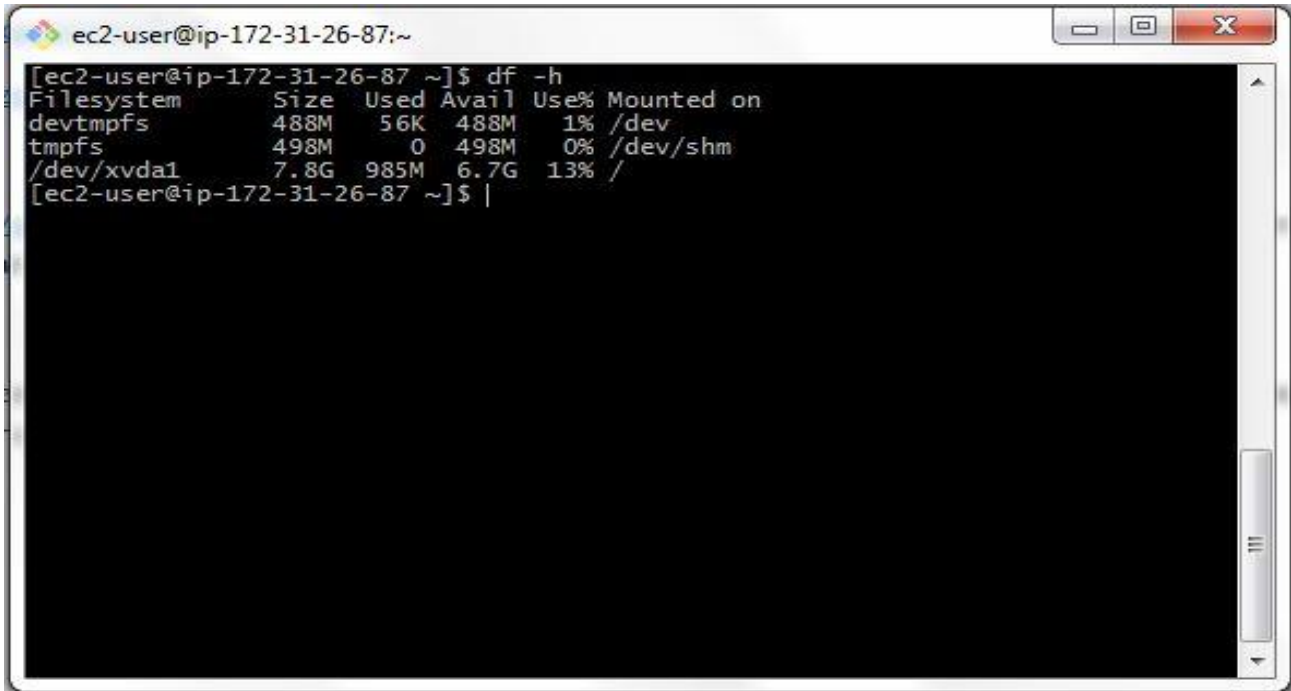
```
ec2-user@ip-172-31-26-87:~  
[ec2-user@ip-172-31-26-87 ~]$ whoami  
ec2-user  
[ec2-user@ip-172-31-26-87 ~]$ |
```

whoami prints the effective user ID.

This command prints the username associated with the current effective user ID.

Running **whoami** is the same as running the **id** command with the options **-un**.

- **df -h**



df displays the amount of disk space available on the file system containing each file name argument. If no file name is given, the space available on all currently mounted file systems is shown. Disk space is shown in 1Kblocks by default, unless the environment variable **POSIXLY_CORRECT** is set, in which case 512-byte blocks are used.

If an argument is the absolute file name of a disk device node containing a mounted file system, **df** shows the space available on that file system rather than on the file system containing the device node. **df** cannot show the space available on un-mounted file systems, because on most kinds of systems doing so requires very system-specific knowledge of file system structures.

Options

-h, --human-readable---- print sizes in human readable format (e.g., 1K 234M 2G)

-a, --all	include dummy file systems.
-B, --block-size=SIZE	scale sizes by SIZE before printing them. E.g., '-BM' prints sizes in units of 1,048,576 bytes. See "SIZE Format" below for more information.
--total	display a grand total.
-h, --human-readable	print sizes in human readable format (e.g., 1K 234M 2G)
-H, --si	same as -h, but use powers of 1000 instead of 1024.
-i, --inodes	list inode information instead of block usage.
-k	like --block-size=1K.
-l, --local	limit listing to local file systems

- **ifconfig -a**

```

[ec2-user@ip-172-31-26-87 ~]$ ifconfig -a
eth0      Link encap:Ethernet  HWaddr 02:26:B0:7B:77:93
          inet addr:172.31.26.87  Bcast:172.31.31.255  Mask:255.255.240.0
          inet6 addr: fe80::26:b0ff:fe7b:7793/64  Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:9001  Metric:1
          RX packets:29324 errors:0 dropped:0 overruns:0 frame:0
          TX packets:15544 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:41640964 (39.7 MiB)  TX bytes:957374 (934.9 KiB)

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          inet6 addr: ::1/128  Scope:Host
          UP LOOPBACK RUNNING  MTU:65536  Metric:1
          RX packets:2 errors:0 dropped:0 overruns:0 frame:0
          TX packets:2 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1
          RX bytes:140 (140.0 b)  TX bytes:140 (140.0 b)

[ec2-user@ip-172-31-26-87 ~]$ |

```

- **ifconfig** is to configure a network interface
- **ifconfig** is used to configure the kernel-resident network interfaces. It is used at boot time to set up interfaces as necessary. After that, it is usually only needed when debugging or when system tuning is needed.
- If no arguments are given, **ifconfig** displays the status of the currently active interfaces. If a single interface argument is given, it displays the status of the given interface only.
- **ifconfig -a**: if a single -a argument is given, it displays the status of all interfaces, even those that are down. Otherwise, it configures an interface

•

- **netstat**

```

[ec2-user@ip-172-31-26-87 ~]$ netstat
Active Internet connections (w/o servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
tcp        0    244 ip-172-31-26-87.us-west:ssh host-studentw-142-30.d:5438 ESTABLISHED

Active UNIX domain sockets (w/o servers)
Proto RefCnt Flags               Type           State         I-Node Path
unix    11      [ ]                 DGRAM          State         9407  /dev/log
unix     2      [ ]                 DGRAM          State         10700
unix     2      [ ]                 DGRAM          State         10679
unix     3      [ ]                 STREAM          CONNECTED      10043  /var/run/dbus/system_b
us_socket
unix     3      [ ]                 STREAM          CONNECTED      10037
unix     2      [ ]                 DGRAM          State         10204
unix     3      [ ]                 STREAM          CONNECTED      10038
unix     2      [ ]                 DGRAM          State         9938
unix     2      [ ]                 DGRAM          State         11054
unix     2      [ ]                 DGRAM          State         10658
unix     2      [ ]                 DGRAM          State         10577
unix     3      [ ]                 STREAM          CONNECTED      10042
unix     3      [ ]                 DGRAM          State         8330
unix     2      [ ]                 DGRAM          State         11427
unix     2      [ ]                 DGRAM          State         11250
unix     3      [ ]                 DGRAM          State         8331
unix     3      [ ]                 STREAM          CONNECTED      11433
unix     3      [ ]                 STREAM          CONNECTED      11432

[ec2-user@ip-172-31-26-87 ~]$ |

```


The netstat command is used to print network connections, routing tables, interface statistics, masquerade connections, and multicast memberships.

Netstat "network statistics" is a command-line tool that displays network connections (both incoming and outgoing), routing tables, and a number of network interface (network interface controller or software-defined network interface) and network protocol statistics.

--route, -r	Display the kernel routing tables. See the description in route for details. netstat -r and route -e produce the same output.
--groups, -g	Display multicast group membership information for IPv4 and IPv6.
--interfaces, -i	Display a table of all network interfaces.
--masquerade, -M	Display a list of masqueraded connections.
--statistics, -s	Display summary statistics for each protocol.

(Reference: <http://aws.amazon.com/ec2/>, <http://docs.amazonwebservices.com/AWSEC2/2009-11-30/GettingStartedGuide/>)