

CS 524 Intro to Cloud computing

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Lab Assignment 1

Step 1: Create an AWS Account by sign in or new user.



Sign In or Create an AWS Account

What is your email (phone for mobile accounts)?

E-mail or mobile number:

dpate62@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?](#)




Step 2: Click on EC2 Amazon Web Service.

Amazon Web Services


Compute

-  **EC2**
Virtual Servers in the Cloud
-  **EC2 Container Service**
Run and Manage Docker Containers
-  **Elastic Beanstalk**
Run and Manage Web Apps
-  **Lambda**
Run Code in Response to Events



Storage & Content Delivery

-  **S3**
Scalable Storage in the Cloud
-  **CloudFront**
Global Content Delivery Network
-  **Elastic File System** PREVIEW
Fully Managed File System for EC2

Developer Tools

-  **CodeCommit**
Store Code in Private Git Repositories
-  **CodeDeploy**
Automate Code Deployments
-  **CodePipeline**
Release Software using Continuous Delivery

Management Tools

-  **CloudWatch**
Monitor Resources and Applications
-  **CloudFormation**
Create and Manage Resources with Templates
-  **CloudTrail**
Track User Activity and API Usage
-  **Config**
Track Resource Inventory and Changes

Step 3: Click on Launch instance in order to create AWS EC2 instance.

0 Placement Groups

Easily deploy Ruby, PHP, Java, .NET, Python, Node.js & Docker applications with [Elastic Beanstalk](#).

Create Instance

To start using Amazon EC2 you will want to launch a virtual server, known as an Amazon EC2 instance.

Launch Instance

Note: Your instances will launch in the US West (Oregon) region

Service Health

Service Status:

- US West (Oregon): This service is operating normally

Availability Zone Status:

- us-west-2a: Availability zone is operating normally
- us-west-2b: Availability zone is operating normally

Scheduled Events

US West (Oregon):

No events

Step 4: Here we use Amazon Linux AMI to host AWS EC2 instance.

Amazon Linux
Free tier eligible

Amazon Linux AMI 2016.03.0 (HVM), SSD Volume Type - ami-c229c0a2

The Amazon Linux AMI is an EBS-backed, AWS-supported image. The default image includes AWS command line other packages.

Root device type: ebs Virtualization type: hvm

Red Hat
Free tier eligible

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
Free tier eligible

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,

Root device type: ebs Virtualization type: hvm

Ubuntu
Free tier eligible

Ubuntu Server 14.04 LTS (HVM), SSD Volume Type - ami-9abea4fb

Ubuntu Server 14.04 LTS (HVM), EBS General Purpose (SSD) Volume Type. Support available from Canonical ([http](#)

Root device type: ebs Virtualization type: hvm

Step 5: For configuring instance details related to security group, click on “Configure Instance Details” button.

EBS only	Yes	High
EBS only	Yes	High
EBS only	Yes	High
EBS only	Yes	10 Gigabit
1 x 4 (SSD)	-	Moderate
1 x 32 (SSD)	-	Moderate
2 x 40 (SSD)	Yes	High
2 x 80 (SSD)	Yes	High

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

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 lower prices.

Number of instances ⓘ [Launch into Auto Scaling Group](#) ⓘ

Purchasing option ⓘ ☐ Request Spot instances

Network ⓘ ⓘ [Create new VPC](#)

Subnet ⓘ ⓘ [Create new subnet](#)

Auto-assign Public IP ⓘ

IAM role ⓘ ⓘ [Create new IAM role](#)

Shutdown behavior ⓘ

Enable termination protection ⓘ ☐ Protect against accidental termination

Monitoring ⓘ ☐ Enable CloudWatch detailed monitoring
[Additional charges apply.](#)

Tenancy ⓘ ⓘ [Additional charges will apply for dedicated tenancy.](#)

Step 6: Add storage up to 30GB for free tier (by default 8GB required for this instance).

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 ⓘ	Delete on Termination ⓘ
Root	/dev/xvda	snap-eef4cdae	8	General Purpose SSD (GP2) ▾	24 / 3000	<input checked="" type="checkbox"/>

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.

Step 7: Enter Key name and Value for Tag Instance.

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 mor](#)

Key (127 characters maximum)	Value (255 characters maximum)
Name	Amazon EC2 Linux Server

Create Tag (Up to 10 tags maximum)

Step 8: Select security group (select an existing 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 w 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 ID	Name	Description
<input checked="" type="checkbox"/> sg-a3b0f7c4	default	default VPC security group

Step 9: Here, we review the details of instance, which to be launched in future.

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.

▼ AMI Details



Amazon Linux AMI 2016.03.0 (HVM), SSD Volume Type - ami-c229c0a2

Free tier
eligible

The Amazon Linux AMI is an EBS-backed, AWS-supported image. The default image includes AWS command line tools, Python, Ruby, F
Root Device Type: ebs Virtualization type: hvm

▼ Instance Type

Instance Type	ECUs	vCPUs	Memory (GiB)	Instance Storage (GB)	EBS-Optimized
t2.micro	Variable	1	1	EBS only	-

▼ Security Groups

Security Group ID	Name	Description
sg-a3b0f7c4	default	default

All selected security groups inbound rules

Security Group ID	Type ⓘ	Protocol ⓘ	Port Range
sg-a3b0f7c4	All traffic	All	All

Step 10: Download private key pair for making secure connection. After then click on “Launch Instance”.

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

Amazon EC2 linux instances

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

Snapshot of launched EC2 instances. It will take few minutes to make instance status as “running” after launch.

Launch InstanceConnectActions

Filter by tags and attributes or search by keyword

	Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks
	Amazon EC2...	i-0a89211e6...	t2.micro	us-west-2b	pending	Initializing

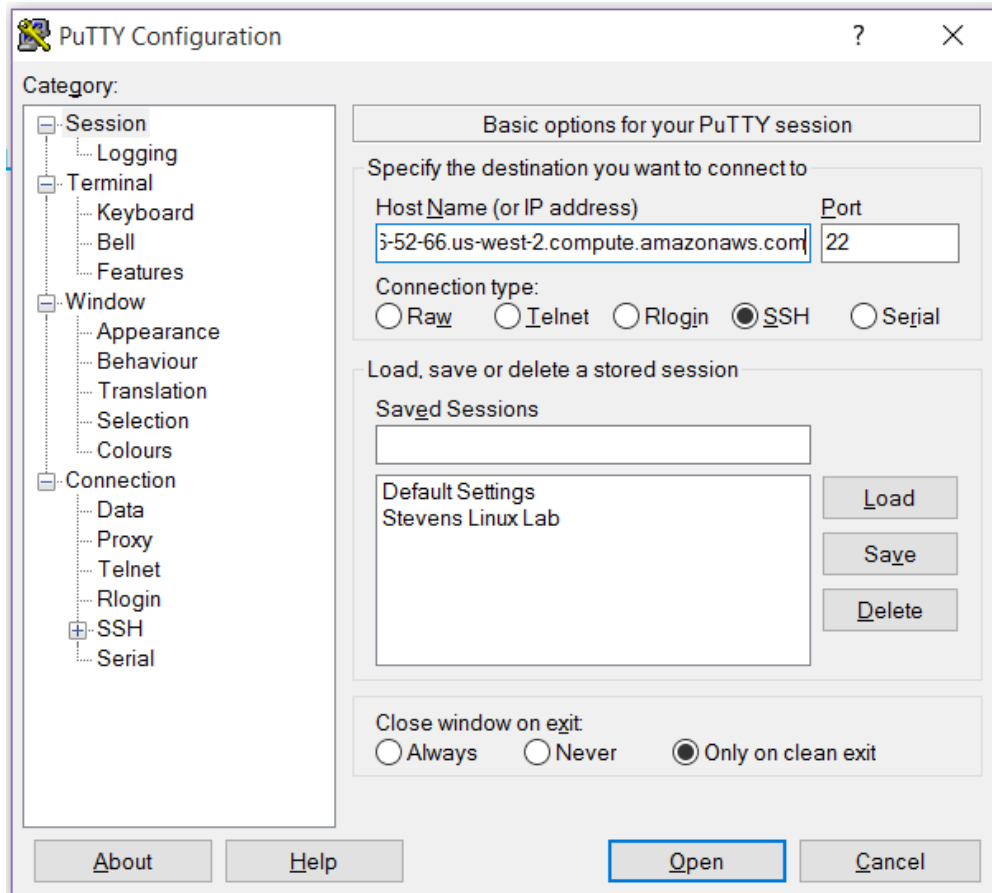
Launch InstanceConnectActions

Filter by tags and attributes or search by keyword

	Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Stat
	Amazon EC2...	i-0a89211e6...	t2.micro	us-west-2b	running	Initializing	None

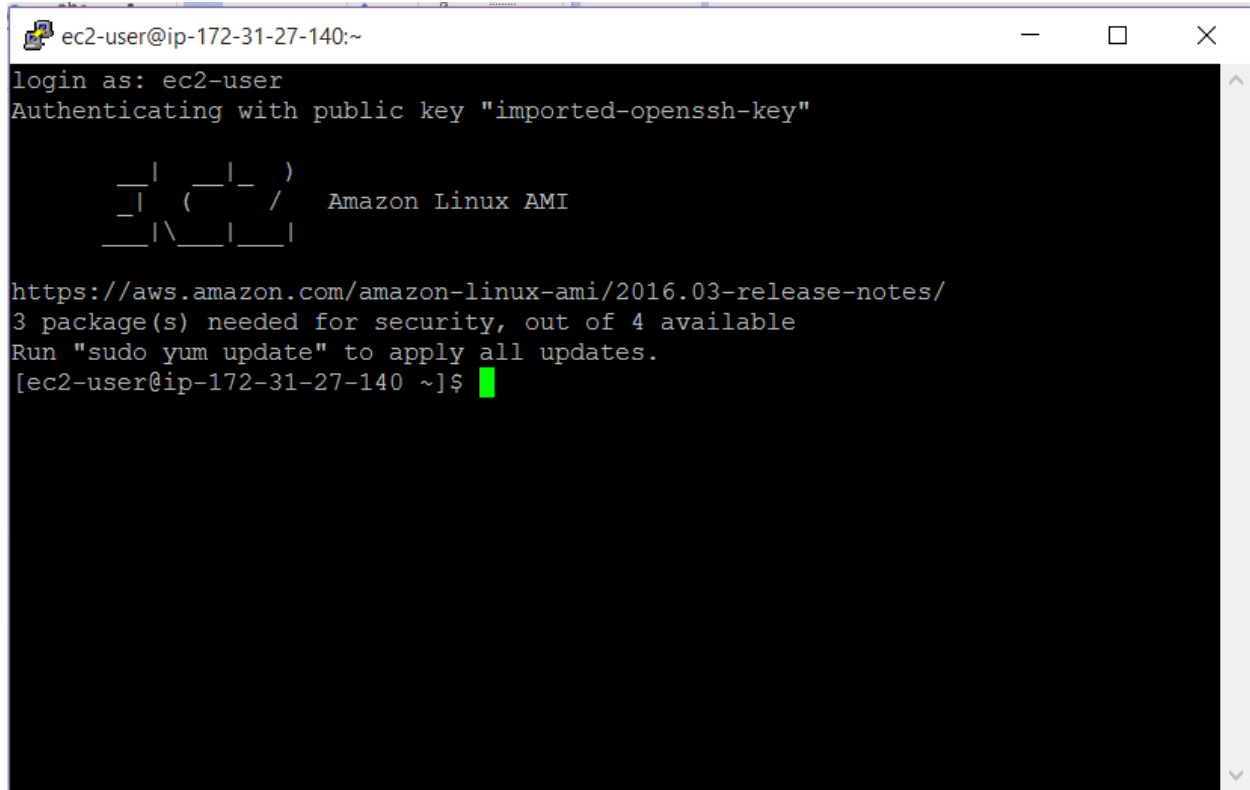
Configuration with Linux SSH

I have downloaded that key and that key I need to change over into ppk utilizing any outsider key generator (I have utilized Putty generator). Now I need to arrange DNS setting and IP configure to connect instance with Linux SSH.



Now we get connected to Amazon EC2 and it is Amazon Linux AMI; so, we can run Linux commands to get the system details.

Here, we use by default login user id “ec2-user”.

A terminal window titled "ec2-user@ip-172-31-27-140:~" with standard window controls. The terminal output shows a successful login for the "ec2-user" using a public key. It displays the Amazon Linux AMI logo, a URL to the release notes, and a message about security updates. The prompt is "[ec2-user@ip-172-31-27-140 ~]\$" with a green cursor.

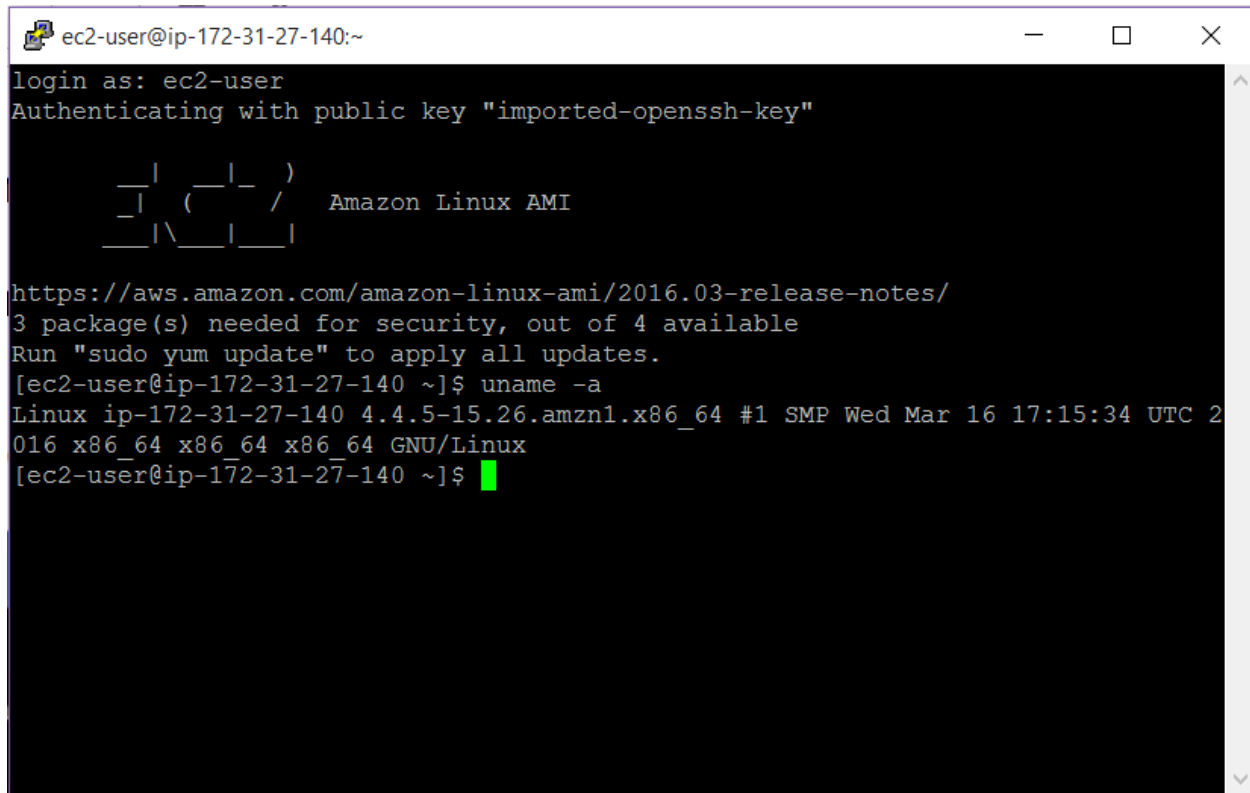
```
ec2-user@ip-172-31-27-140:~
login as: ec2-user
Authenticating with public key "imported-openssh-key"

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

https://aws.amazon.com/amazon-linux-ami/2016.03-release-notes/
3 package(s) needed for security, out of 4 available
Run "sudo yum update" to apply all updates.
[ec2-user@ip-172-31-27-140 ~]$
```


cmd 1: `uname -a`

It gives system identification. Option `-a` prints the name, version and different insights about the current machine and the operation system running on it. Here I have run 64bit Amazon instance which is begun on `ec2-user` login. It demonstrates the version of Linux. Here it is GNU/Linux.



```
ec2-user@ip-172-31-27-140:~
login as: ec2-user
Authenticating with public key "imported-openssh-key"

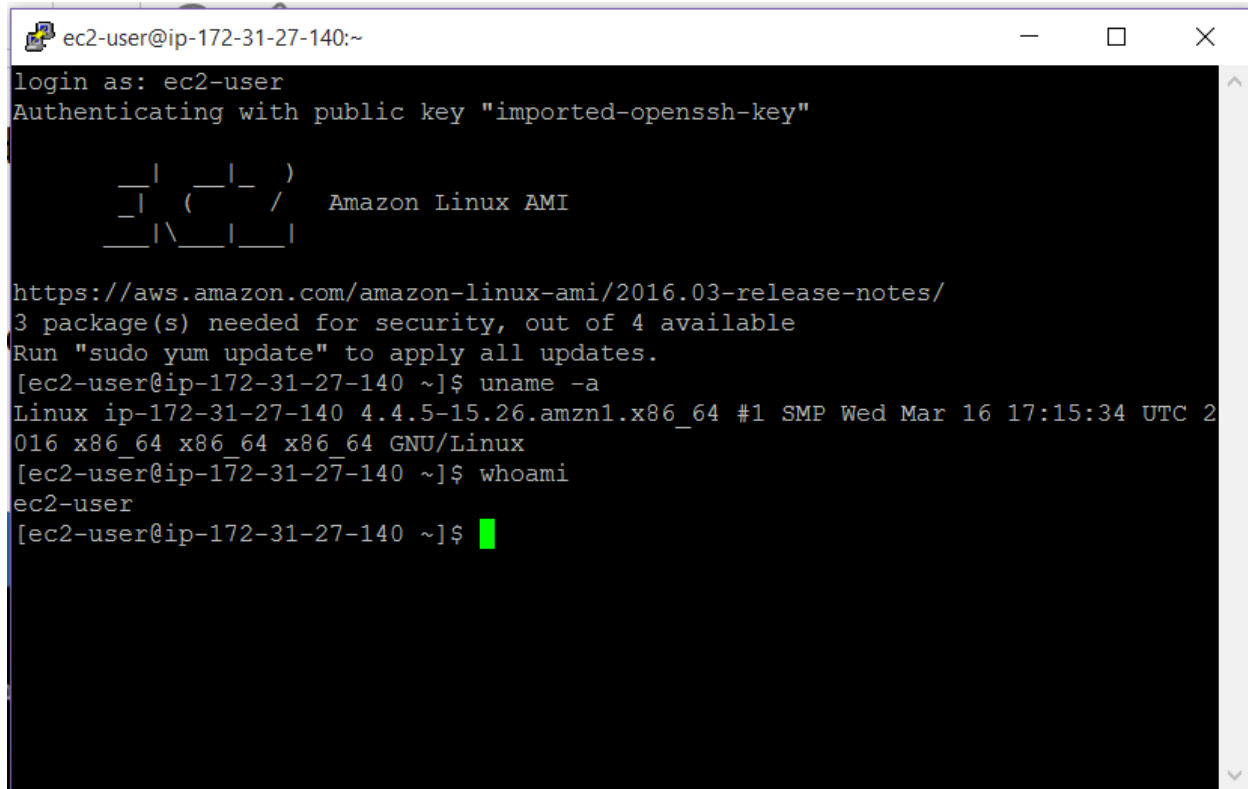
  ____|  _||_ )
 _|| (_____/  Amazon Linux AMI
  ____| \___|___|

https://aws.amazon.com/amazon-linux-ami/2016.03-release-notes/
3 package(s) needed for security, out of 4 available
Run "sudo yum update" to apply all updates.
[ec2-user@ip-172-31-27-140 ~]$ uname -a
Linux ip-172-31-27-140 4.4.5-15.26.amzn1.x86_64 #1 SMP Wed Mar 16 17:15:34 UTC 2
016 x86_64 x86_64 x86_64 GNU/Linux
[ec2-user@ip-172-31-27-140 ~]$
```

cmd 2: whoami

It display effective user name and username connected with the current powerful client ID.

The **whoami** display the client name (i.e., login name) of the manager of the current login session to standard login. Here, login is indicated as above (ec2-user).



```
ec2-user@ip-172-31-27-140:~  
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/  
3 package(s) needed for security, out of 4 available  
Run "sudo yum update" to apply all updates.  
[ec2-user@ip-172-31-27-140 ~]$ uname -a  
Linux ip-172-31-27-140 4.4.5-15.26.amzn1.x86_64 #1 SMP Wed Mar 16 17:15:34 UTC 2016 x86_64 x86_64 x86_64 GNU/Linux  
[ec2-user@ip-172-31-27-140 ~]$ whoami  
ec2-user  
[ec2-user@ip-172-31-27-140 ~]$
```

cmd 3: df -h

df is used to check the file system disk usage

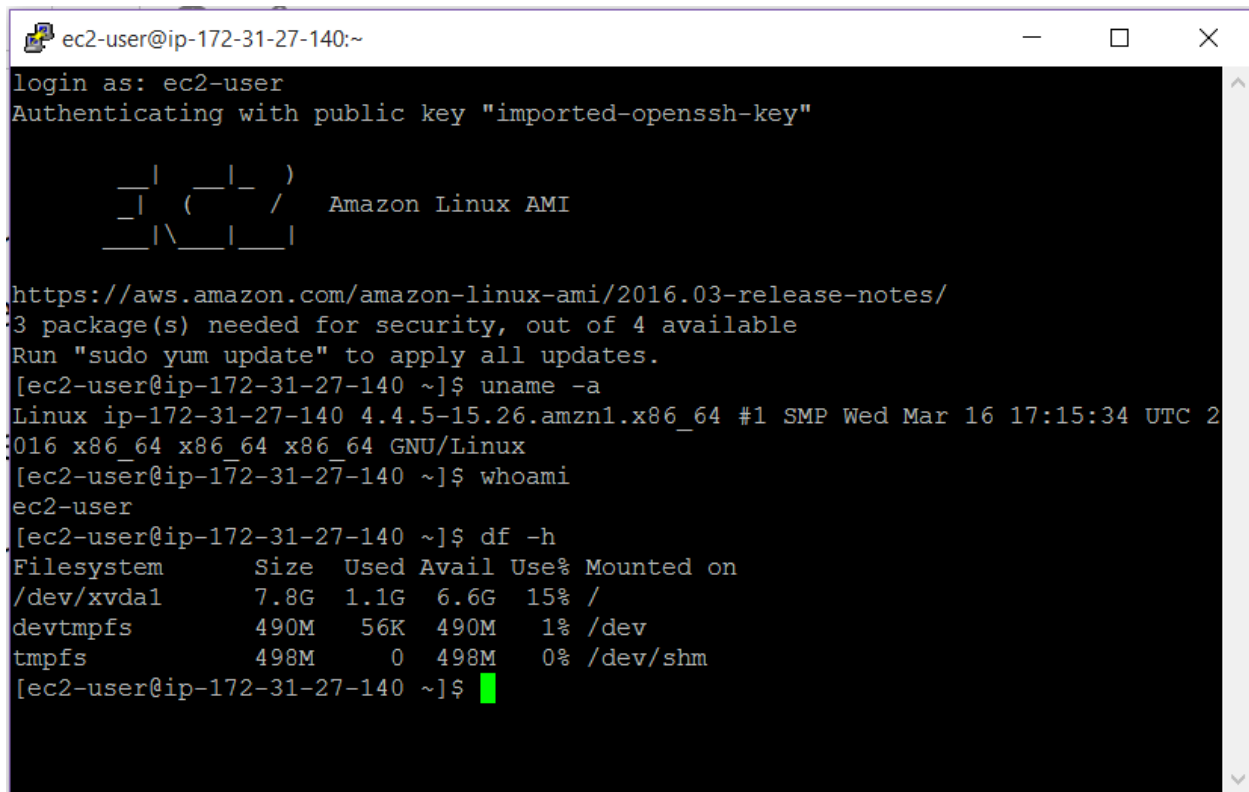
-h, --human-readable= print sizes in human readable format

Command gives following information in below image is:

The first column of Filesystem is the device record way name of file system (generally the hard disk parts).

The second column gives information of memory allocated to different hard disk parts.

The last column gives an insights about where each disk is mounted.

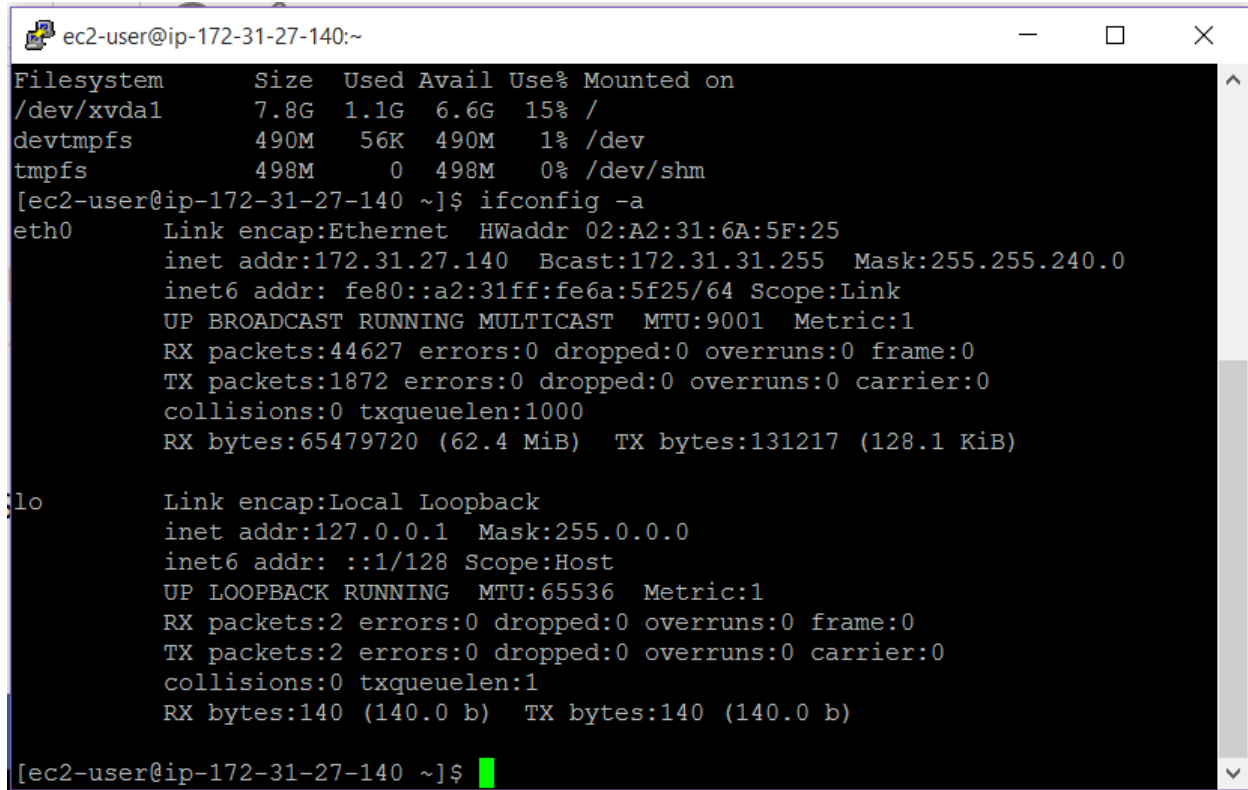
A terminal window titled 'ec2-user@ip-172-31-27-140:~' showing the output of the 'df -h' command. The terminal displays the Amazon Linux AMI logo, a link to AWS release notes, and the output of 'uname -a' and 'whoami'. The 'df -h' command output is as follows:

Filesystem	Size	Used	Avail	Use%	Mounted on
/dev/xvda1	7.8G	1.1G	6.6G	15%	/
devtmpfs	490M	56K	490M	1%	/dev
tmpfs	498M	0	498M	0%	/dev/shm

cmd 4: ifconfig -a

This command gives an insights about current network configuration information, setting up an IP address, netmask or broadcast address to a network interface, creating an alias for network interface, setting up hardware address and enable or disable network interfaces.

ifconfig command with -a argument will display information of all active or inactive network interfaces on server. -a = display all interfaces which are currently available, even if they are down.



```
ec2-user@ip-172-31-27-140:~  
Filesystem      Size  Used Avail Use% Mounted on  
/dev/xvda1      7.8G  1.1G  6.6G  15% /  
devtmpfs        490M   56K  490M   1% /dev  
tmpfs           498M    0   498M   0% /dev/shm  
[ec2-user@ip-172-31-27-140 ~]$ ifconfig -a  
eth0      Link encap:Ethernet  HWaddr 02:A2:31:6A:5F:25  
          inet addr:172.31.27.140  Bcast:172.31.31.255  Mask:255.255.240.0  
          inet6 addr: fe80::a2:31ff:fe6a:5f25/64 Scope:Link  
          UP BROADCAST RUNNING MULTICAST  MTU:9001  Metric:1  
          RX packets:44627 errors:0 dropped:0 overruns:0 frame:0  
          TX packets:1872 errors:0 dropped:0 overruns:0 carrier:0  
          collisions:0 txqueuelen:1000  
          RX bytes:65479720 (62.4 MiB)  TX bytes:131217 (128.1 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-172-31-27-140 ~]$
```

cmd 5: netstat

netstat ("system statistics") is a command line tool that shows network connection(both approaching and friendly), routing tables, and various system interface (network interface controller or software characterized system interface) and system convention insights.

It is used for discovering issues as a part of the system and to focus the measure of activity on the system as an execution estimation. Also, this yield is indicated as take after.

Netstat: netstat command displays various network related information such as network connections, routing tables, interface statistics and other details. The output is explained below:

1. Proto: The protocol (usually unix) used by the socket.
2. RefCnt: The reference count
3. Flags: The flags displayed is SO_ACCEPTON (displayed as ACC), SO_WAITDATA (W) or SO_NOSPACE (N). SO_ACCEPTON is used on unconnected sockets
4. Type: There are several types of socket access:
 - SOCK_DGRAM: The socket is used in Datagram mode.
 - SOCK_STREAM: This is a stream socket.
 - SOCK_RAW: The socket is used as a raw socket.
 - SOCK_RDM: serves reliably-delivered messages.
 - SOCK_SEQPACKET: sequential packet socket.
 - SOCK_PACKET: Raw interface access socket.
5. State: contain one of the following Keywords:
 - FREE: The socket is not allocated
 - LISTENING: The socket is listening for a connection request.
 - CONNECTING: establish a connection.
 - CONNECTED: connected.
 - DISCONNECTING: disconnecting.
 - (empty): socket is not connected to another one.
6. PID/Program name: Process ID (PID) and process name of the process that has the socket open.
7. Path: path name as which the corresponding processes attached to the socket.

```
ec2-user@ip-172-31-27-140:~  
[ec2-user@ip-172-31-27-140 ~]$ netstat  
Active Internet connections (w/o servers)  
Proto Recv-Q Send-Q Local Address           Foreign Address         State  
tcp        0      304 ip-172-31-27-140.us-wes:ssh c-76-117-52-157.hsd1.:53723 ESTABLISHED  
Active UNIX domain sockets (w/o servers)  
Proto RefCnt Flags   Type       State         I-Node Path  
unix    8      [ ]     DGRAM      -           9105  /dev/log  
unix    3      [ ]     DGRAM      -           8171  -  
unix    3      [ ]     STREAM     CONNECTED   9426  -  
unix    2      [ ]     DGRAM      -          10004  -  
unix    2      [ ]     DGRAM      -          10126  -  
unix    3      [ ]     STREAM     CONNECTED   9431  -  
unix    2      [ ]     DGRAM      -          10438  -  
unix    3      [ ]     STREAM     CONNECTED   10443  -  
unix    3      [ ]     DGRAM      -           8170  -  
unix    3      [ ]     STREAM     CONNECTED   9427  -  
unix    3      [ ]     STREAM     CONNECTED   10442  -  
unix    3      [ ]     STREAM     CONNECTED   9432  /var/run/dbus/system_bus_socket  
unix    2      [ ]     DGRAM      -           9316  -  
unix    2      [ ]     DGRAM      -          10084  -  
unix    2      [ ]     DGRAM      -          10105  -  
[ec2-user@ip-172-31-27-140 ~]$
```

