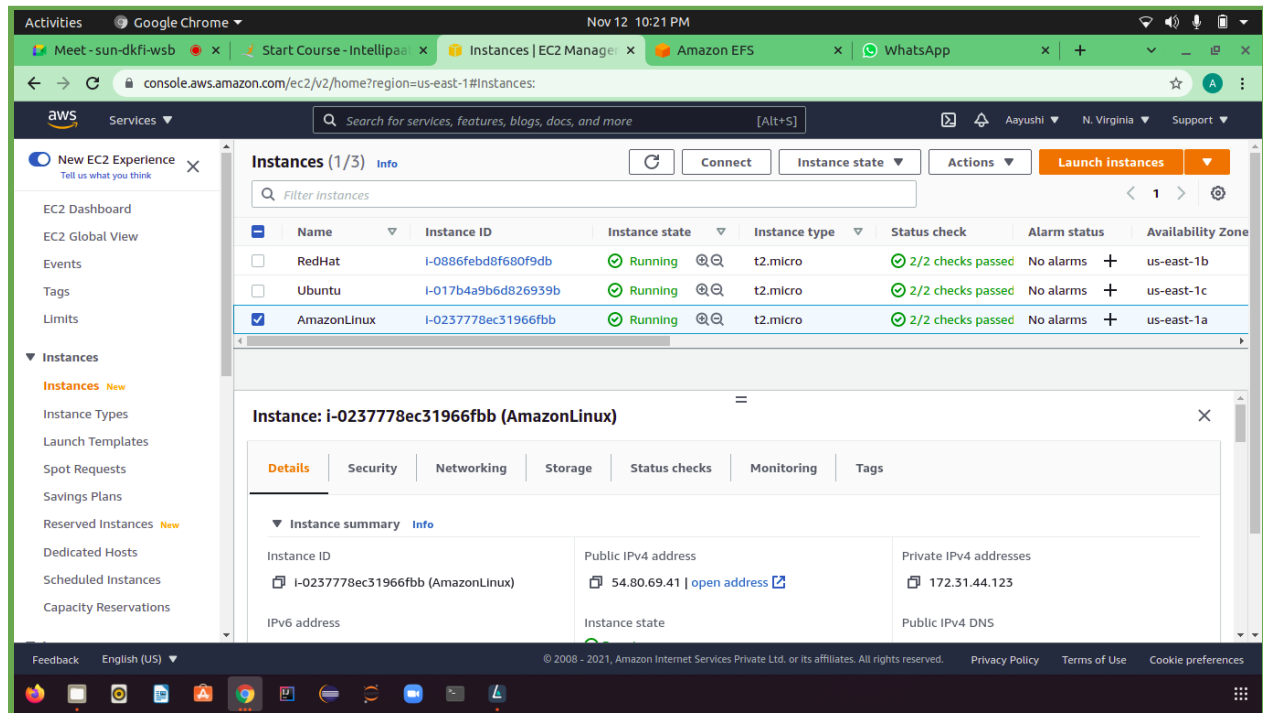# Module - 2: EC2 and EFS assignment -3

1. Create an EFS and connect it to 3 different EC2 instances. Make sure all instances have different Operating Systems. For instances, Ubuntu, Red Hat Linux and Amazon Linux 2.

Create Ubuntu Instance
Create amazon linux 2
Red hat linux

Create EFS

Create file system

Create an EFS file system with service recommended settings. Learn more ⬈

Name - optional
Name your file system.

```
EFScreation
```

Name must not be longer than 256 characters, and must only contain letters, numbers, and these characters: + - = . _ : /

Virtual Private Cloud (VPC)
Choose the VPC where you want EC2 instances to connect to your file system. Learn more ⬈

```
vpc-5de29436
default                                                    ▼
```

Availability and Durability
Choose Regional (recommended) to create a file system using regional storage classes. Choose One Zone to create a file system using One Zone storage classes. Learn more ⬈

● Regional	○ One Zone
Stores data redundantly across multiple AZs	Stores data redundantly within a single AZ

Cancel | **Customize** | **Create**

File systems (1)   ⟳   View details   Delete   **Create file system**

Q Filter by property values   < 1 >   ⚙

	Name ▽	File system ID ▽	Encrypted ▽	Total size ▽	Size in Standard / One Zone ▽	Size in Standard-IA / One Zone-IA ▽	Provisioned Throughput (MiB/s) ▽
○	EFScreation	fs-0e9eeffd01 73e9ad4	⊘ Encrypted	6.00 KiB	6.00 KiB	0 Bytes	-

Attach EFS
1. Mount via ip
2. And select the availability zone
3. Copy the mount command

Attach   ✕

Mount your Amazon EFS file system on a Linux instance. Learn more 🗗

| ○ Mount via DNS | ● Mount via IP |

Availability zone

ap-south-1a   ▼

Using the NFS client:

```
sudo mount -t nfs4 -o nfsvers=4.1,rsize=1048576,wsize=1048576,hard,timeo=600,retrans=2,noresvport 172.31.40.210:/ efs
```

See our user guide for more information. User guide 🗗

Close

Goto the network

Copy security group and go to the security groups and search it

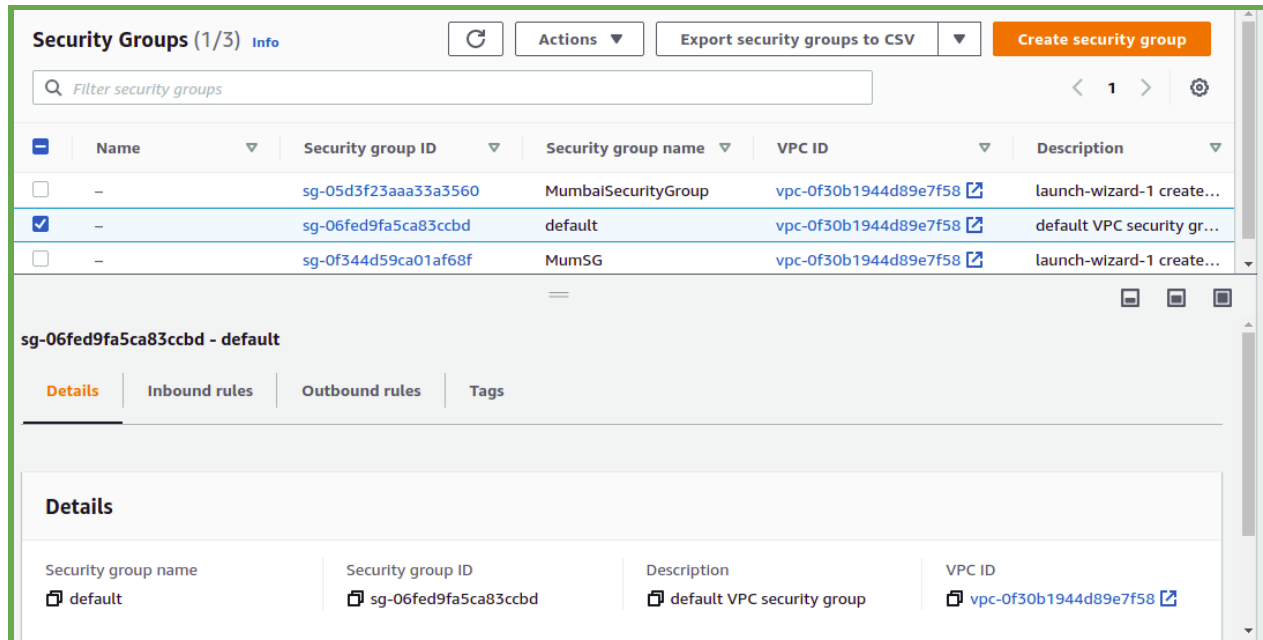| Metered size | Monitoring | Tags | File system policy | Access points | **Network** |

Network   ⟳   Manage

                                                                            ⚙

Availability zone ▲	Mount target ID ▽	Subnet ID ▽	Mount target state ▽	IP address ▽	Network interface ID ▽	Security groups ▽
ap-south-1a	fsmt-05ec7ee0e0414d3e8	subnet-07ee28c9b7f5724fa	⊘ Available	172.31.40.210	eni-0c99ae84395f621bf	sg-06fed9fa5ca83ccbd (default)

After select security group edit inbound rule
Add new rule like as below
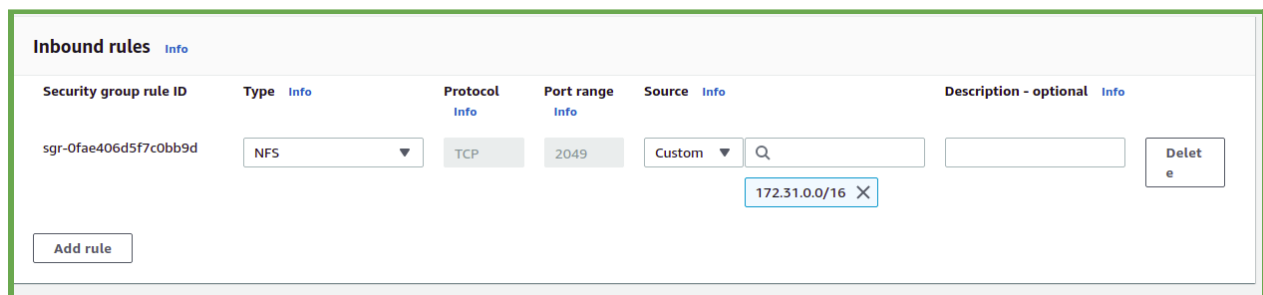
Now open command prompt

Command for Amazon-Linux-2

Now get the permission of private key
Using command: **chmod 400 Key name.pem**
This is the explanation of the SSH command:

- ssh: Command to use SSH protocol
- -i: Flag that specifies an alternate identification file to use for public key authentication.
- username: Username that uses your instance
- ip-address: IP address given to your instance

Using command **ssh i key name.pem username@Public-ip-address**

Run the following command to install the amazon-efs-utils package
Using command: **sudo yum install amazon-efs-utils -y**
Make directory using: **mkdir dir_name**
Sudo yum list all | grep dir_name

Now run mounted command

Check the status by using command: **df -h**

                                    Mount -s | grep dir_name

```
[ec2-user@ip-172-31-46-163 ~]$
[ec2-user@ip-172-31-46-163 ~]$ df -h
Filesystem        Size  Used Avail Use% Mounted on
devtmpfs          484M     0  484M   0% /dev
tmpfs             492M     0  492M   0% /dev/shm
tmpfs             492M  404K  491M   1% /run
tmpfs             492M     0  492M   0% /sys/fs/cgroup
/dev/xvda1        8.0G  1.5G  6.6G  19% /
tmpfs              99M     0   99M   0% /run/user/1000
172.31.40.210:/   8.0E     0  8.0E   0% /home/ec2-user/efs
[ec2-user@ip-172-31-46-163 ~]$
[ec2-user@ip-172-31-46-163 ~]$
[ec2-user@ip-172-31-46-163 ~]$
[ec2-user@ip-172-31-46-163 ~]$
[ec2-user@ip-172-31-46-163 ~]$ mount -s | grep efs
sunrpc on /var/lib/nfs/rpc_pipefs type rpc_pipefs (rw,relatime)
172.31.40.210:/ on /home/ec2-user/efs type nfs4 (rw,relatime,vers=4.1,rsize=1048
576,wsize=1048576,namlen=255,hard,noresvport,proto=tcp,timeo=600,retrans=2,sec=s
ys,clientaddr=172.31.46.163,local_lock=none,addr=172.31.40.210)
[ec2-user@ip-172-31-46-163 ~]$
```

Now set the permissions to the directory
Using command: **sudo chmod 777 dir_name**
Go inside directory and create file: **echo "hello efs" >MyEFSFile.html**

```
[ec2-user@ip-172-31-46-163 ~]$
[ec2-user@ip-172-31-46-163 ~]$ sudo chmod 777 efs
[ec2-user@ip-172-31-46-163 ~]$
[ec2-user@ip-172-31-46-163 ~]$
[ec2-user@ip-172-31-46-163 ~]$
[ec2-user@ip-172-31-46-163 ~]$
[ec2-user@ip-172-31-46-163 ~]$ cd efs
[ec2-user@ip-172-31-46-163 efs]$
[ec2-user@ip-172-31-46-163 efs]$
[ec2-user@ip-172-31-46-163 efs]$ echo "HELLO EFS" > MyEFSFile.html
[ec2-user@ip-172-31-46-163 efs]$
```

Connect other instances

Commands for Red Hat

Now get the permission of private key
Using command: **chmod 400 Key name.pem**
This is the explanation of the SSH command:

- ssh: Command to use SSH protocol
- -i: Flag that specifies an alternate identification file to use for public key authentication.
- username: Username that uses your instance
- ip-address: IP address given to your instance

Using command **ssh i key name.pem username@Public-ip-address**

```
root@Varonica:/home/aayushi/Downloads#
root@Varonica:/home/aayushi/Downloads# chmod 400 EFSKeypair.pem
root@Varonica:/home/aayushi/Downloads#
root@Varonica:/home/aayushi/Downloads#
root@Varonica:/home/aayushi/Downloads#
root@Varonica:/home/aayushi/Downloads# ssh -i "EFSKeypair.pem" ec2-user@ec2-13-2
33-168-75.ap-south-1.compute.amazonaws.com
Last login: Sat Nov 13 12:14:14 2021 from 203.192.216.132
```

Packages need to update by using command: **sudo yum update-y**

```
[ec2-user@ip-172-31-32-4 ~]$
[ec2-user@ip-172-31-32-4 ~]$ sudo yum update -y
Updating Subscription Management repositories.
```

Run the following command to install the nfs-utils package
Using command: **sudo yum install -y nfs-utils**

```
[ec2-user@ip-172-31-32-4 ~]$ sudo yum install -y nfs-utils
Updating Subscription Management repositories.
Unable to read consumer identity

This system is not registered with an entitlement server. You can use subscripti
on-manager to register.

Last metadata expiration check: 0:27:09 ago on Saturday 13 November 2021 12:37:1
5 PM UTC.
Package nfs-utils-1:2.3.3-46.el8.x86_64 is already installed.
Dependencies resolved.
Nothing to do.
Complete!
```

Make directory efs
Run again mounted command

```
[ec2-user@ip-172-31-32-4 ~]$
[ec2-user@ip-172-31-32-4 ~]$ mkdir efs
[ec2-user@ip-172-31-32-4 ~]$
[ec2-user@ip-172-31-32-4 ~]$ ls -l
total 0
drwxrwxr-x. 2 ec2-user ec2-user 6 Nov 13 13:05 efs
[ec2-user@ip-172-31-32-4 ~]$
[ec2-user@ip-172-31-32-4 ~]$
[ec2-user@ip-172-31-32-4 ~]$
[ec2-user@ip-172-31-32-4 ~]$
[ec2-user@ip-172-31-32-4 ~]$ sudo mount -t nfs4 -o nfsvers=4.1,rsize=1048576,wsi
ze=1048576,hard,timeo=600,retrans=2,noresvport 172.31.40.210:/ efs
[ec2-user@ip-172-31-32-4 ~]$
```

Check the status by using command: **df -h**

```
[ec2-user@ip-172-31-32-4 ~]$
[ec2-user@ip-172-31-32-4 ~]$ df -h
Filesystem        Size  Used Avail Use% Mounted on
devtmpfs          375M     0  375M   0% /dev
tmpfs             404M     0  404M   0% /dev/shm
tmpfs             404M   21M  383M   6% /run
tmpfs             404M     0  404M   0% /sys/fs/cgroup
/dev/xvda2         10G  2.4G  7.6G  24% /
tmpfs              81M     0   81M   0% /run/user/1000
172.31.40.210:/   8.0E     0  8.0E   0% /home/ec2-user/efs
[ec2-user@ip-172-31-32-4 ~]$
[ec2-user@ip-172-31-32-4 ~]$
[ec2-user@ip-172-31-32-4 ~]$
[ec2-user@ip-172-31-32-4 ~]$
[ec2-user@ip-172-31-32-4 ~]$ cd efs
[ec2-user@ip-172-31-32-4 efs]$
```

Check now same file and data as similar to the first instance

```
[ec2-user@ip-172-31-32-4 efs]$ ls -l
total 4
-rw-rw-r--. 1 ec2-user ec2-user 10 Nov 13 12:48 MyEFSFile.html
[ec2-user@ip-172-31-32-4 efs]$
[ec2-user@ip-172-31-32-4 efs]$
[ec2-user@ip-172-31-32-4 efs]$
[ec2-user@ip-172-31-32-4 efs]$ cat MyEFSFile.html
HELLO EFS
[ec2-user@ip-172-31-32-4 efs]$
[ec2-user@ip-172-31-32-4 efs]$
```

Commands for Ubuntu
Now get the permission of private key
Using command: **chmod 400 Key name.pem**

This is the explanation of the SSH command:

- ssh: Command to use SSH protocol
- -i: Flag that specifies an alternate identification file to use for public key authentication.
- username: Username that uses your instance
- ip-address: IP address given to your instance

Using command **ssh i key name.pem username@Public-ip-address**

```
root@Varonica:/home/aayushi/Downloads# chmod 400 EFSKeypair.pem
root@Varonica:/home/aayushi/Downloads#
root@Varonica:/home/aayushi/Downloads#
root@Varonica:/home/aayushi/Downloads# ssh -i "EFSKeypair.pem" ubuntu@ec2-3-109-
182-233.ap-south-1.compute.amazonaws.com
The authenticity of host 'ec2-3-109-182-233.ap-south-1.compute.amazonaws.com (3.
109.182.233)' can't be established.
ECDSA key fingerprint is SHA256:HvxKQQM9wMHX/vu3uaUdzhezcFvFmlUKnLK2CJ5r9k4.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added 'ec2-3-109-182-233.ap-south-1.compute.amazonaws.com,3
.109.182.233' (ECDSA) to the list of known hosts.
Welcome to Ubuntu 20.04.3 LTS (GNU/Linux 5.11.0-1020-aws x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/advantage

  System information as of Sat Nov 13 12:49:21 UTC 2021

  System load:  0.08               Processes:             98
  Usage of /:   17.7% of 7.69GB    Users logged in:       0
  Memory usage: 20%                IPv4 address for eth0: 172.31.40.105
```

Packages need to update by using command: **sudo apt-get update -y**

```
ubuntu@ip-172-31-40-105:~$
ubuntu@ip-172-31-40-105:~$ sudo apt-get update -y
Hit:1 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu focal InRelease
Get:2 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu focal-updates InRelease [1
14 kB]
```

Run the following command to install the nfs-common package
Using command: **sudo apt-get install nfs-common -y**

```
ubuntu@ip-172-31-40-105:~$
ubuntu@ip-172-31-40-105:~$ sudo apt-get install nfs-common -y
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  keyutils libnfsidmap2 libtirpc-common libtirpc3 rpcbind
Suggested packages:
  watchdog
The following NEW packages will be installed:
  keyutils libnfsidmap2 libtirpc-common libtirpc3 nfs-common rpcbind
0 upgraded, 6 newly installed, 0 to remove and 24 not upgraded.
Need to get 404 kB of archives.
After this operation, 1517 kB of additional disk space will be used.
Get:1 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu focal/main amd64 libtirpc-
common all 1.2.5-1 [7632 B]
Get:2 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu focal/main amd64 libtirpc3
 amd64 1.2.5-1 [77.2 kB]
Get:3 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu focal/main amd64 rpcbind a
md64 1.2.5-8 [42.8 kB]
Get:4 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu focal/main amd64 keyutils
amd64 1.6-6ubuntu1 [45.0 kB]
```

Run the mounted command

```
ubuntu@ip-172-31-40-105:~$
ubuntu@ip-172-31-40-105:~$ sudo mount -t nfs4 -o nfsvers=4.1,rsize=1048576,wsize
=1048576,hard,timeo=600,retrans=2,noresvport 172.31.40.210:/ efs
ubuntu@ip-172-31-40-105:~$
```

Check the status of mount

```
ubuntu@ip-172-31-40-105:~$
ubuntu@ip-172-31-40-105:~$ df -h
Filesystem         Size  Used Avail Use% Mounted on
/dev/root          7.7G  1.6G  6.2G  20% /
devtmpfs           482M     0  482M   0% /dev
tmpfs              487M     0  487M   0% /dev/shm
tmpfs               98M  820K   97M   1% /run
tmpfs              5.0M     0  5.0M   0% /run/lock
tmpfs              487M     0  487M   0% /sys/fs/cgroup
/dev/loop0          25M   25M     0 100% /snap/amazon-ssm-agent/4046
/dev/loop1          56M   56M     0 100% /snap/core18/2128
/dev/loop2          62M   62M     0 100% /snap/core20/1169
/dev/loop3          68M   68M     0 100% /snap/lxd/21545
/dev/loop4          33M   33M     0 100% /snap/snapd/13640
tmpfs               98M     0   98M   0% /run/user/1000
172.31.40.210:/    8.0E     0  8.0E   0% /home/ubuntu/efs
ubuntu@ip-172-31-40-105:~$
ubuntu@ip-172-31-40-105:~$
```

Make directory
Go to the directory and see the same file and data

```
ubuntu@ip-172-31-40-105:~$
ubuntu@ip-172-31-40-105:~$ mkdir efs
ubuntu@ip-172-31-40-105:~$
ubuntu@ip-172-31-40-105:~$
ubuntu@ip-172-31-40-105:~$ cd efs
ubuntu@ip-172-31-40-105:~/efs$
```

```
ubuntu@ip-172-31-40-105:~/efs$
ubuntu@ip-172-31-40-105:~/efs$ ls -l
total 4
-rw-rw-r-- 1 ubuntu ubuntu 10 Nov 13 12:48 MyEFSFile.html
ubuntu@ip-172-31-40-105:~/efs$ cat MyEFSFile.html
HELLO EFS
ubuntu@ip-172-31-40-105:~/efs$
```