

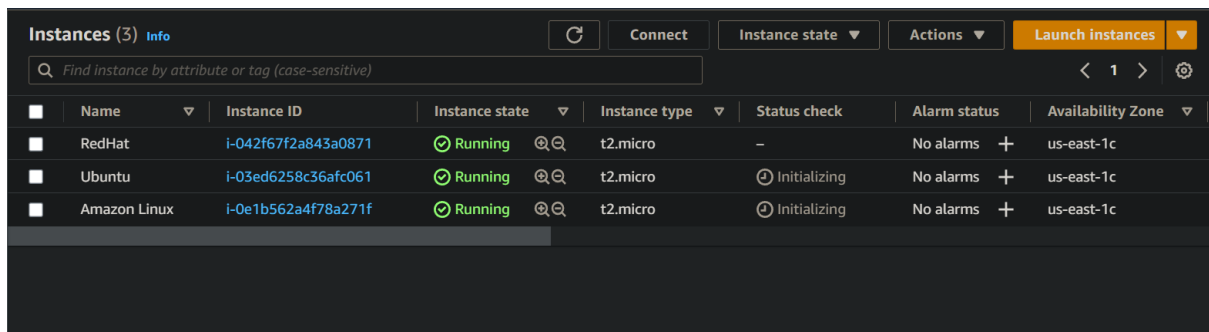
## Assignment 1

### Tasks to be performed:

Create an EFS and connect it to 3 different EC2 instances. Make sure that all instances have different operating systems. For instance, Ubuntu, Red Hat Linux and Amazon Linux 2.

### Solution:

Step 1:- Creating 3 EC2 Instances of Ubuntu, RedHat & Amazon Linux. Make sure to enable SSH & NFS port in the Security Groups for the EC2.



The screenshot displays the AWS Management Console's 'Instances' page. At the top, there are buttons for 'Connect', 'Instance state', 'Actions', and 'Launch instances'. A search bar is present with the placeholder text 'Find instance by attribute or tag (case-sensitive)'. Below the search bar, a table lists three EC2 instances. Each instance row includes a checkbox, the instance name, its ID, its state (all are 'Running'), its type (all are 't2.micro'), its status check (RedHat is '-', Ubuntu and Amazon Linux are 'Initializing'), its alarm status (all are 'No alarms'), and its availability zone (all are 'us-east-1c').

|                          | Name         | Instance ID         | Instance state | Instance type | Status check | Alarm status | Availability Zone |
|--------------------------|--------------|---------------------|----------------|---------------|--------------|--------------|-------------------|
| <input type="checkbox"/> | RedHat       | i-042f67f2a843a0871 | Running        | t2.micro      | -            | No alarms    | us-east-1c        |
| <input type="checkbox"/> | Ubuntu       | i-03ed6258c36afc061 | Running        | t2.micro      | Initializing | No alarms    | us-east-1c        |
| <input type="checkbox"/> | Amazon Linux | i-0e1b562a4f78a271f | Running        | t2.micro      | Initializing | No alarms    | us-east-1c        |

Step 2:- Run `apt install nfs-common -y` command in Ubuntu EC2 & `sudo yum install nfs-utils -y` command in RedHat EC2.

### Ubuntu:

```
< > ↺ us-east-1.console.aws.amazon.com/ec2-instance-connect/ssh?connType=standa

aws Services 🔍 Search [Alt+S]

To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

ubuntu@ip-172-31-85-97:~$ sudo su
root@ip-172-31-85-97:/home/ubuntu# lsblk
NAME        MAJ:MIN RM  SIZE RO TYPE MOUNTPOINTS
loop0        7:0    0   24.4M  1 loop /snap/amazon-ssm-agent/6312
loop1        7:1    0   55.6M  1 loop /snap/core18/2745
loop2        7:2    0   63.3M  1 loop /snap/core20/1879
loop3        7:3    0  111.9M  1 loop /snap/lxd/24322
loop4        7:4    0   53.2M  1 loop /snap/snapd/19122
xvda        202:0    0    8G    0 disk 
├─xvda1     202:1    0    7.9G  0 part /
├─xvda14    202:14   0     4M    0 part 
└─xvda15    202:15   0   106M  0 part /boot/efi
root@ip-172-31-85-97:/home/ubuntu#
root@ip-172-31-85-97:/home/ubuntu#
root@ip-172-31-85-97:/home/ubuntu# apt install nfs-common -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  keyutils libnfsidmap1 rpcbind
Suggested packages:
  watchdog
The following NEW packages will be installed:
```

i-03ed6258c36afc061 (Ubuntu)  
PublicIPs: 3.83.184.94 PrivateIPs: 172.31.85.97

## RedHat:

```
aws Services 🔍 Search [Alt+S] [N. Virginia] Pratheek_Learner @ 8284-3864-8625

AWS CloudShell Actions ⓘ

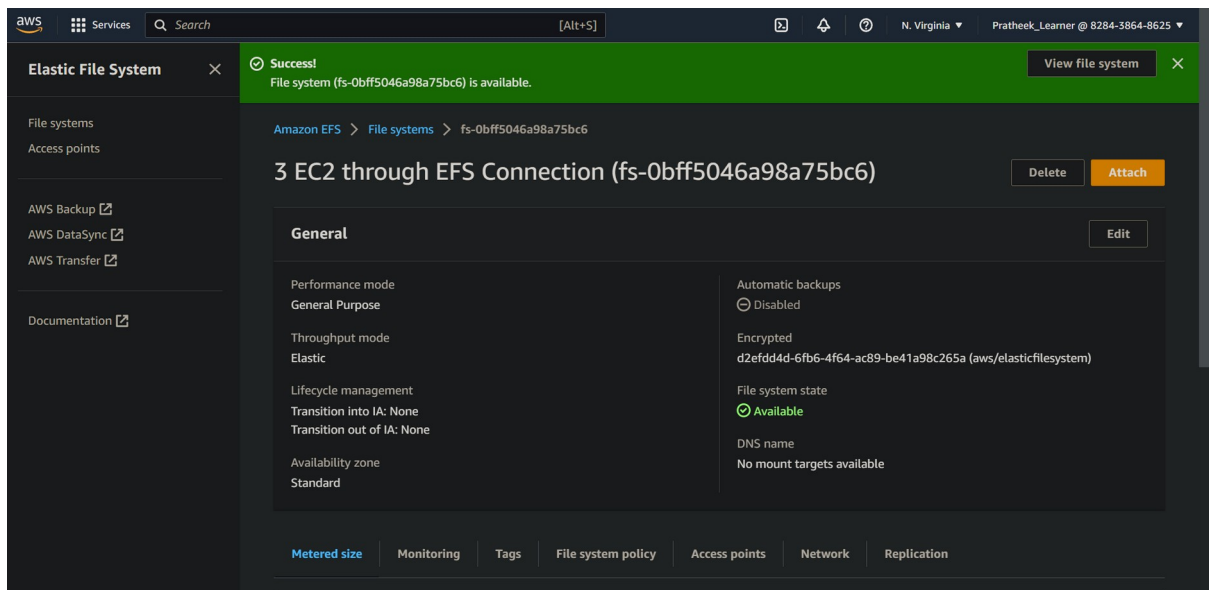
us-east-1

CloudShell terminal value for
Red Hat Enterprise Linux 9 for x86_64 - AppStream from RHUI (RPMs) 26 MB/s | 24 MB 00:00
Red Hat Enterprise Linux 9 for x86_64 - BaseOS from RHUI (RPMs) 26 MB/s | 13 MB 00:00
Red Hat Enterprise Linux 9 Client Configuration 23 kB/s | 3.2 kB 00:00
No match for argument: nfs-utils-y
Error: Unable to find a match: nfs-utils-y
[root@ip-172-31-85-172 ec2-user]# yum install nfs-utils -y
Updating Subscription Management repositories.
Unable to read consumer identity

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

Last metadata expiration check: 0:01:21 ago on Thu 03 Aug 2023 07:07:43 AM UTC.
Dependencies resolved.
=====
Package                                Architecture      Version            Repository          Size
-----
Installing:
nfs-utils                               x86_64            1:2.5.4-18.el9    rhel-9-baseos-rhui-rpms 459 k
Installing dependencies:
gssproxy                               x86_64            0.8.4-5.el9_2     rhel-9-baseos-rhui-rpms 114 k
keyutils                               x86_64            1.6.3-1.el9       rhel-9-baseos-rhui-rpms 78 k
libev                                   x86_64            4.33-5.el9        rhel-9-baseos-rhui-rpms 56 k
libnfsidmap                             x86_64            1:2.5.4-18.el9    rhel-9-baseos-rhui-rpms 66 k
libtirpc                               x86_64            1.3.3-1.el9       rhel-9-baseos-rhui-rpms 96 k
libverto-libev                          x86_64            0.3.2-3.el9       rhel-9-baseos-rhui-rpms 15 k
quota                                   x86_64            1:4.06-6.el9      rhel-9-baseos-rhui-rpms 202 k
quota-nls                               noarch            1:4.06-6.el9      rhel-9-baseos-rhui-rpms 81 k
rpcbind                                 x86_64            1.2.6-5.el9       rhel-9-baseos-rhui-rpms 62 k
sssd-nfs-idmap                          x86_64            2.8.2-2.el9       rhel-9-baseos-rhui-rpms 44 k
=====
Transaction Summary
-----
Install 11 Packages
Total download size: 1.2 M
Installed size: 3.2 M
Downloading Packages:
(1/11): libev-4.33-5.el9.x86_64.rpm 942 kB/s | 56 kB 00:00
(2/11): libverto-libev-0.3.2-3.el9.x86_64.rpm 240 kB/s | 15 kB 00:00
```

Step 3:- Create an EFS system for the above EC2



Step 4:- Create a directory in each instances so as to mount the EFS.

Step 5:- Then attach the EFS using the command provided in the attach section of EFS.

```

[ec2-user@ip-172-31-87-21 ~]$ sudo su
[root@ip-172-31-87-21 ec2-user]# ls
[root@ip-172-31-87-21 ec2-user]# mkdir efs-al
[root@ip-172-31-87-21 ec2-user]# ls
efs-al
[root@ip-172-31-87-21 ec2-user]# sudo mount -t nfs4 -o nfsvers=4.1,rsize=1048576,wsiz=1048576,hard,timeo=600,retrans=2,noresvport ip-172-31-87-21-east-1.amazonaws.com:/ efs-al
[root@ip-172-31-87-21 ec2-user]# lsblk
NAME        MAJ:MIN RM  SIZE RO TYPE MOUNTPOINTS
xvda        202:0    0   8G  0 disk 
├─xvda1      202:1    0   8G  0 part /
├─xvda127    259:0    0  1M  0 part 
└─xvda128    259:1    0 10M  0 part 
[root@ip-172-31-87-21 ec2-user]# df -h
Filesystem            Size  Used Avail Use% Mounted on
devtmpfs              4.0M   0   4.0M  0% /dev
tmpfs                 475M   0   475M  0% /dev/shm
tmpfs                 190M  2.8M  188M  2% /run
/dev/xvda1            8.0G  1.5G  6.5G  19% /
tmpfs                 475M   0   475M  0% /tmp
tmpfs                 95M    0    95M  0% /run/user/1000
fs-0bff5046a98a75bc6.efs.us-east-1.amazonaws.com:/  8.0E   0  8.0E  0% /home/ec2-user/efs-al
[root@ip-172-31-87-21 ec2-user]#

i-0e1b562a4f78a271f (Amazon Linux)
PublicIPs: 52.91.18.207 PrivateIPs: 172.31.87.21

```

Step 6:- Create a file in one of the EC2 instance inside the EFS mount point folder & the file should appear on all the other EC2 EFS mount file points.

```
aws Services Search [Alt+S]
[root@ip-172-31-87-21 ec2-user]# ls
[root@ip-172-31-87-21 ec2-user]# mkdir efs-al
[root@ip-172-31-87-21 ec2-user]# ls
efs-al
[root@ip-172-31-87-21 ec2-user]# sudo mount -t nfs4 -o nfsvers=4.1,rsize=1048576,wsiz=1048576,hard,timeo=600,retrans=2,n
-east-1.amazonaws.com:/ efs-al
[root@ip-172-31-87-21 ec2-user]# lsblk
NAME        MAJ:MIN RM  SIZE RO TYPE MOUNTPOINTS
xvda         202:0    0   8G  0 disk
├─xvda1      202:1    0   8G  0 part /
├─xvda127    259:0    0   1M  0 part
└─xvda128    259:1    0  10M  0 part
[root@ip-172-31-87-21 ec2-user]# df -h
Filesystem                                Size  Used Avail Use% Mounted on
devtmpfs                                  4.0M    0  4.0M   0% /dev
tmpfs                                     475M    0  475M   0% /dev/shm
tmpfs                                    190M  2.8M  188M   2% /run
/dev/xvda1                               8.0G  1.5G  6.5G  19% /
tmpfs                                     475M    0  475M   0% /tmp
tmpfs                                     95M    0   95M   0% /run/user/1000
fs-0bff5046a98a75bc6.efs.us-east-1.amazonaws.com:/ 8.0E    0  8.0E   0% /home/ec2-user/efs-al
[root@ip-172-31-87-21 ec2-user]# cd efs-al/
[root@ip-172-31-87-21 efs-al]# touch efs.txt
[root@ip-172-31-87-21 efs-al]# ls
efs.txt
[root@ip-172-31-87-21 efs-al]#
```

i-0e1b562a4f78a271f (Amazon Linux)

PublicIPs: 52.91.18.207 PrivateIPs: 172.31.87.21

```
aws Services Search [Alt+S] N. Vir
No user sessions are running outdated binaries.

No VM guests are running outdated hypervisor (qemu) binaries on this host.
root@ip-172-31-85-97:/home/ubuntu# ls
root@ip-172-31-85-97:/home/ubuntu# mkdir efs-ub
root@ip-172-31-85-97:/home/ubuntu# ls
efs-ub
root@ip-172-31-85-97:/home/ubuntu# ^[[200~sudo mount -t nfs4 -o nfsvers=4.1,rsize=1048576,wsiz=1048576,hard,timeo=600,retran
c6.efs.us-east-1.amazonaws.com:/ efs-ub
sudo: command not found
root@ip-172-31-85-97:/home/ubuntu# sudo mount -t nfs4 -o nfsvers=4.1,rsize=1048576,wsiz=1048576,hard,timeo=600,retrans=2,nor
us-east-1.amazonaws.com:/ efs-ub
root@ip-172-31-85-97:/home/ubuntu# df -h
Filesystem                                Size  Used Avail Use% Mounted on
/dev/root                                  7.6G  1.6G  6.0G  21% /
tmpfs                                     483M    0  483M   0% /dev/shm
tmpfs                                    194M  852K  193M   1% /run
tmpfs                                     5.0M    0   5.0M   0% /run/lock
/dev/xvda15                               105M  6.1M   99M   6% /boot/efi
tmpfs                                     97M  4.0K   97M   1% /run/user/1000
fs-0bff5046a98a75bc6.efs.us-east-1.amazonaws.com:/ 8.0E    0  8.0E   0% /home/ubuntu/efs-ub
root@ip-172-31-85-97:/home/ubuntu# cd efs-ub/
root@ip-172-31-85-97:/home/ubuntu/efs-ub# ls
efs.txt
root@ip-172-31-85-97:/home/ubuntu/efs-ub#
```

i-03ed6258c36afc061 (Ubuntu)

PublicIPs: 3.83.184.94 PrivateIPs: 172.31.85.97

aws

Services

Search

[Alt+S]

us-east-1

AWS CloudShell

```
CloudShell script: 1:2.5.4-18.el9.x86_64
Installing      : sssd-nfs-idmap-2.8.2-2.el9.x86_64
Running scriptlet: sssd-nfs-idmap-2.8.2-2.el9.x86_64
Verifying      : quota-nls-1:4.06-6.el9.noarch
Verifying      : libverto-libev-0.3.2-3.el9.x86_64
Verifying      : libev-4.33-5.el9.x86_64
Verifying      : quota-1:4.06-6.el9.x86_64
Verifying      : rpcbind-1.2.6-5.el9.x86_64
Verifying      : nfs-utils-1:2.5.4-18.el9.x86_64
Verifying      : libtirpc-1.3.3-1.el9.x86_64
Verifying      : sssd-nfs-idmap-2.8.2-2.el9.x86_64
Verifying      : keyutils-1.6.3-1.el9.x86_64
Verifying      : libnfsidmap-1:2.5.4-18.el9.x86_64
Verifying      : gssproxy-0.8.4-5.el9_2.x86_64
Installed products updated.

Installed:
gssproxy-0.8.4-5.el9_2.x86_64    keyutils-1.6.3-1.el9.x86_64    libev-4.33-5.el9.x86_64    libnfsidmap-1:2.5.4-18.el9.x86_64    libtirpc-1.3.3-1.el9.x86_64    libverto-libev-0.3.2-3.el9.x86_64
nfs-utils-1:2.5.4-18.el9.x86_64    quota-1:4.06-6.el9.x86_64    quota-nls-1:4.06-6.el9.noarch    rpcbind-1.2.6-5.el9.x86_64    sssd-nfs-idmap-2.8.2-2.el9.x86_64

Complete!
[root@ip-172-31-82-172 ec2-user]# mkdir efs-rh
[root@ip-172-31-82-172 ec2-user]# ls
efs-rh
[root@ip-172-31-82-172 ec2-user]# sudo mount -t nfs4 -o nfsvers=4.1,rsize=1048576,wsize=1048576,hard,timeo=600,retrans=2,noresvport fs-0bff5046a98a75bc6.efs.us-east-1.amazonaws.com:/ efs-rh
[root@ip-172-31-82-172 ec2-user]# df -h
Filesystem                Size      Used Avail Use% Mounted on
devtmpfs                   4.0M        0   4.0M   0% /dev
tmpfs                      385M        0   385M   0% /dev/shm
tmpfs                      154M        0   154M   0% /run
/dev/xvda4                  9.4G       1.3G   8.1G  14% /
/dev/xvda3                  495M       153M   343M  31% /boot
/dev/xvda2                  200M        8.0K   200M   1% /boot/efi
tmpfs                       77M        0    77M   0% /run/user/1000
fs-0bff5046a98a75bc6.efs.us-east-1.amazonaws.com:/  8.0E        0   8.0E   0% /home/ec2-user/efs-rh
[root@ip-172-31-82-172 ec2-user]# cd efs-rh/
[root@ip-172-31-82-172 efs-rh]# ls
efs.txt
[root@ip-172-31-82-172 efs-rh]#
```