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## Create and Attach the EFS File System

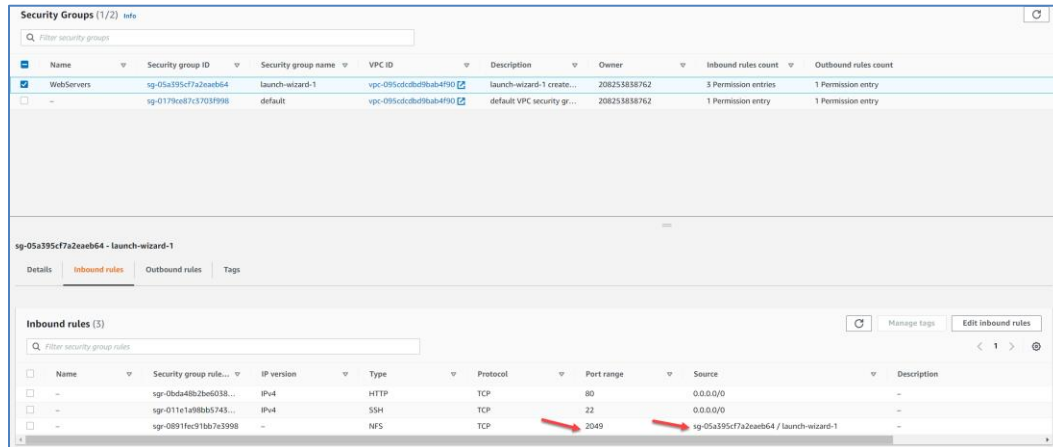
### You have been asked to:

1. Create an EFS and connect it to 3 different EC2 instances. Make sure all instances have

Different Operating Systems. For instance, Ubuntu, Red Hat Linux, and Amazon Linux 2.

### Security Groups:

Modify the security group to allow NFS port (2049)



Creating the EFS (Elastic File System)

Navigate to **EFS Service** → Click **“Create File System”** →

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File system settings

General

Name: optional  
Name your file system.  
MyEFS

Storage class: Standard (Stores data redundantly across multiple AZs) | One Zone (Stores data redundantly within a single AZ)

Automatic backups: Automatically back up your file system data with AWS Backup using recommended settings. Additional pricing applies. Learn more

Enable automatic backups

Lifecycle management: Lifecycle Management is automatically selected to achieve the right price and performance blend for your application by moving your files between the Standard and Standard Infrequent Access storage classes. Learn more

Transition into IA: Standard files from Standard to Standard-Infrequent Access | Transition out of IA: Standard files from Standard-Infrequent Access to Standard

30 days since last access

Encryption: Choose to enable encryption of your file system data at rest. Use the AWS EFS service key benchmarks. Request by default. Learn more

Enable encryption of data at rest

Customize encryption settings

Performance settings

Throughput mode: Choose a mode for your file system throughput limits. Learn more

Enhanced: Provides even flexibility and higher throughput limits for workloads with a range of performance requirements. | Bursting: Provides throughput that scales with the amount of storage for workloads with burst performance requirements.

Classic recommended: Use this mode for workloads with unpredictable I/O. With Classic mode, you throughput scales automatically and you only pay for what you use. | Provisioned: Use this mode if you can estimate your workload throughput requirements. With Provisioned mode, you configure your file system throughput and pay for throughput provisioned.

Additional settings

Tags optional

Cancel Next

1. Provide EFS a Name i.e..MyEFS
2. Select the storage class depending on your requirement “Standard” is recommended. One Zone option is cost reduction and non-critical data.
3. If you want backups for the EFS check mark for “Enable automatic backups”
4. For more security you can enable “Enable encryption of data at rest”
5. Select Throughput Mode “Enhanced” is recommended

Click **“Next”**

Network access

Network

Virtual Private Cloud (VPC): Learn more  
Choose the VPC where you want EFS instances to connect to your Amazon EC2 instances.  
vpc-0f5c0d8a7b5ab4790

Mount targets

Mount target provides an NFSv4 endpoint at which you can mount an Amazon EFS file system. We recommend creating one mount target per Availability Zone. Learn more

Availability zone	Subnet ID	IP address
us-west-2a	subnet-03a805f5c0d4b787	Automatic
us-west-2b	subnet-03a805f5c0d4b787	Automatic
us-west-2c	subnet-0f54b132a7f5ca273	Automatic
us-west-2d	subnet-0b7c1952ba05d822	Automatic

Add mount target  
You can only create one mount target per Availability Zone.

Security groups

Choose security groups  
sg-05a39c77a2ae664  
Launch-wizard-1

Choose security groups  
sg-05a39c77a2ae664  
Launch-wizard-1

Choose security groups  
sg-05a39c77a2ae664  
Launch-wizard-1

Choose security groups  
sg-05a39c77a2ae664  
Launch-wizard-1

Cancel Previous Next

Select the correct VPC where all the EC2 instances are located

Assign security correct group (Otherwise network traffic is not allowed)

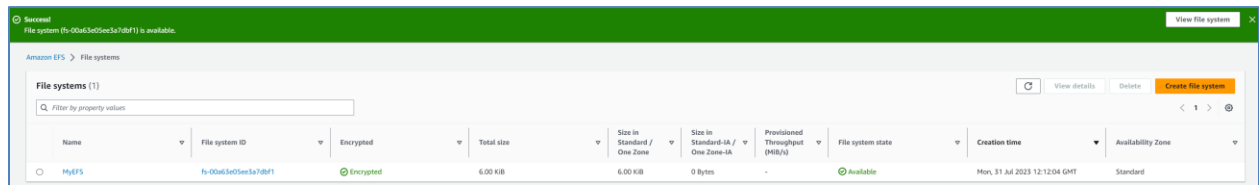
Click **“Next”**

File system policy Do not select anything just click **“Next”**

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Click **“Create”**



EFS is created and available in few seconds

Now click on file system name to collect the EFS path for the mount

Click **“Attach”**



Copy the commands

Launch multiple EC2 instances and assign same security group which is assigned to EFS File system.



1. Ubuntu Server – EC2 instance
2. RHEL 9 Server – EC2 instance
3. Amazon Linux 2023 – EC2 instance

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```
ubuntu@ip-172-31-21-32:~$ sudo -s
root@ip-172-31-21-32:/home/ubuntu# cd
root@ip-172-31-21-32:~# lab_release -a
No LSB modules are available.
Distributor ID: Ubuntu
Description:    Ubuntu 22.04.2 LTS
Release:        22.04
Codename:       jammy
root@ip-172-31-21-32:~# date
Mon Jul 31 12:29:28 UTC 2023
root@ip-172-31-21-32:~# 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  832K  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
root@ip-172-31-21-32:~# /myefs
bash: /myefs: No such file or directory
root@ip-172-31-21-32:~# mkdir /myefs
root@ip-172-31-21-32:~# sudo mount -t nfs4 -o nfsvers=4.1,rsize=1048576,wsize=1048576,hard,timeo=600,retrans=2,noresvport fs-00a63e05ee3a7dbf1.efs.us-west-2.amazonaws.com:/ /myefs
mount: /myefs: bad option; for several filesystems (e.g. nfs, cifs) you might need a /sbin/mount.<type> helper program.
root@ip-172-31-21-32:~#
```

Install the nfs-common package using the below command to resolve the above error message

```
apt-get install nfs-common -y
```

Attempt to remount

```
root@ip-172-31-21-32:~# sudo mount -t nfs4 -o nfsvers=4.1,rsize=1048576,wsize=1048576,hard,timeo=600,retrans=2,noresvport fs-00a63e05ee3a7dbf1.efs.us-west-2.amazonaws.com:/ /myefs
root@ip-172-31-21-32:~# 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-00a63e05ee3a7dbf1.efs.us-west-2.amazonaws.com:/  8.0E   0  8.0E   0% /myefs
root@ip-172-31-21-32:~# date
Mon Jul 31 12:40:23 UTC 2023
```

Mounted successfully on Ubuntu and Amazon Linux as shown in screen shot

```
root@ip-172-31-24-116:~# 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  2.0M  188M   2% /run
/dev/xvda1       8.0G  1.6G  6.4G  20% /
tmpfs            475M   0  475M   0% /tmp
tmpfs            95M   0   95M   0% /run/user/0
root@ip-172-31-24-116:~# mkdir /myefs
root@ip-172-31-24-116:~# sudo mount -t nfs4 -o nfsvers=4.1,rsize=1048576,wsize=1048576,hard,timeo=600,retrans=2,noresvport fs-00a63e05ee3a7dbf1.efs.us-west-2.amazonaws.com:/ /myefs
root@ip-172-31-24-116:~# 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  2.0M  188M   2% /run
/dev/xvda1       8.0G  1.6G  6.4G  20% /
tmpfs            475M   0  475M   0% /tmp
tmpfs            95M   0   95M   0% /run/user/0
fs-00a63e05ee3a7dbf1.efs.us-west-2.amazonaws.com:/  8.0E   0  8.0E   0% /myefs
root@ip-172-31-24-116:~# date
Mon Jul 31 12:34:03 UTC 2023
root@ip-172-31-24-116:~# cat /etc/os-release
NAME="Amazon Linux"
VERSION="2023"
ID="amazon"
ID_LIKE="fedora"
VERSION_ID="2023"
PLATFORM_ID="platform2023"
PRETTY_NAME="Amazon Linux 2023"
ANSI_COLOR="0;33"
CPE_NAME="cpe:2.3:amazon:amazon_linux:2023"
HOME_URL="https://aws.amazon.com/linux/"
BUG_REPORT_URL="https://github.com/amazonlinux/amazon-linux-2023"
SUPPORT_URL="https://aws.amazon.com/linux"
root@ip-172-31-24-116:~#
```

```
root@ip-172-31-26-240:~#
[ec2-user@ip-172-31-26-240 ~]$
[ec2-user@ip-172-31-26-240 ~]$ sudo -s
[root@ip-172-31-26-240 ec2-user]# cd
[root@ip-172-31-26-240 ~]#
[root@ip-172-31-26-240 ~]# cat /etc/redhat-release
Red Hat Enterprise Linux release 9.2 (Plow)
[root@ip-172-31-26-240 ~]# uptime
12:29:03 up 12 min, 1 user, load average: 0.00, 0.00, 0.00
[root@ip-172-31-26-240 ~]# date
Mon Jul 31 12:29:05 PM UTC 2023
[root@ip-172-31-26-240 ~]# 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  4.4M  150M   3% /run
/dev/xvda4       9.4G  1.2G  8.2G  13% /
/dev/xvda3       495M  153M  343M  31% /boot
/dev/xvda2       200M  8.0K  200M   1% /boot/efi
tmpfs            77M   0   77M   0% /run/user/1000
root@ip-172-31-26-240:~# mkdir /myefs
root@ip-172-31-26-240:~# sudo mount -t nfs4 -o nfsvers=4.1,rsize=1048576,wsize=1048576,hard,timeo=600,retrans=2,noresvport fs-00a63e05ee3a7dbf1.efs.us-west-2.amazonaws.com:/ /myefs
mount: /myefs: bad option; for several filesystems (e.g. nfs, cifs) you might need a /sbin/mount.<type> helper program.
root@ip-172-31-26-240:~# 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: 0:02:17 ago on Mon Jul 31 2023 12:30:22 PM UTC.
Dependencies resolved.

```

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## Get the similar error message in RHEL 9

```
[root@ip-172-31-26-240 ~]# sudo mount -t nfs4 -o
nfsvers=4.1,rsize=1048576,wsiz=1048576,hard,timeo=600,
retrans=2,noresvport fs-00a63e05ee3a7dbf1.efs.us-west-
2.amazonaws.com:/ /myefs
```

mount: /myefs: bad option; for several filesystems  
(e.g. nfs, cifs) you might need a /sbin/mount.<type>  
helper program.

Install nfs-utils package using the below command

```
yum install nfs-utils -y
```

```
root@ip-172-31-21-32:~# sudo mount -t nfs4 -o nfsvers=4.1,rsize=1048576,wsiz=1048576,hard,timeo=600,retrans=2,noresvport fs-00a63e05ee3a7dbf1.efs.us-west-2.amazonaws.com:/ /myefs
root@ip-172-31-21-32:~# 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-00a63e05ee3a7dbf1.efs.us-west-2.amazonaws.com:/ 8.0E    0   8.0E   0% /myefs
root@ip-172-31-21-32:~# date
Mon Jul 31 12:40:23 UTC 2023
```

Attempt to mount is successful on RHEL 9