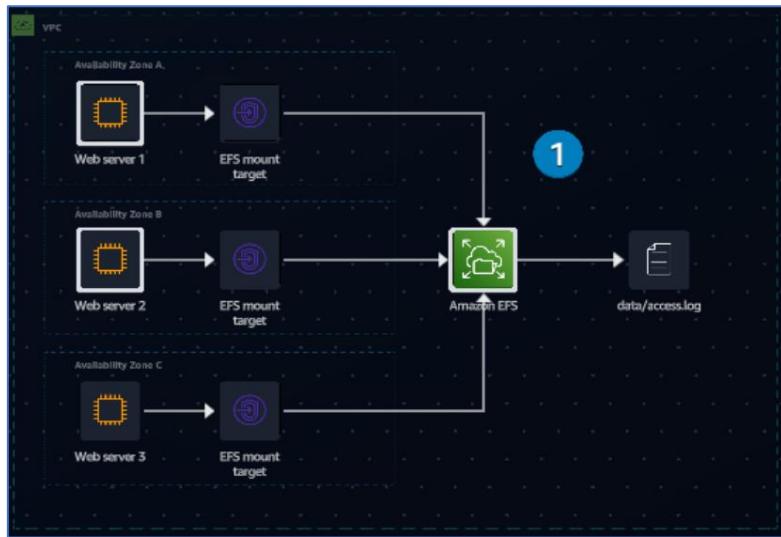


## BUILDING A COLLABORATIVE MEDIA PLATFORM WITH EFS

### Objectives:

- Set up Amazon EFS.
- Create a mount target for the pet client photos repository.
- Deploy and maintain a file system infrastructure that is accessible from multiple servers.



This solution reduces some administrative tasks associated with a company's web servers. A centralized Amazon Elastic File System (Amazon EFS) file system is used so that each web server does not separately need to store configuration, image, and log files.

After the EFS file system is created, Amazon Elastic Compute Cloud (Amazon EC2) instances within the same Virtual Private Cloud (VPC) have simultaneous access to the shared file system, so dynamic content can be managed and changed quickly.

Also, after the file system is active, a mount target is created within each Availability Zone (AZ). The mount target provides an IP address for an endpoint to which the instance can mount the file system.

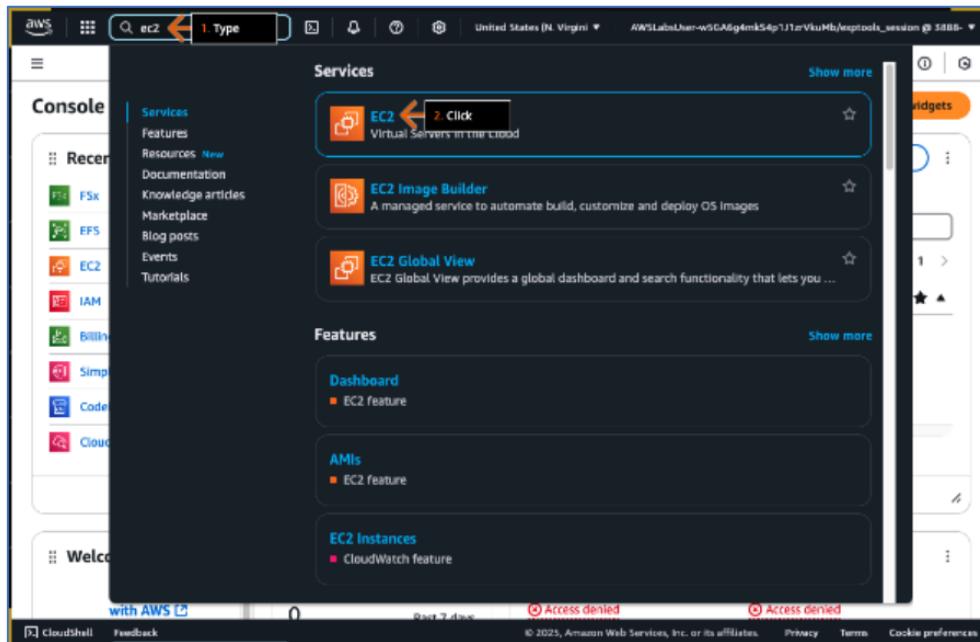
The web servers attach the mount target located within their AZ as a local folder on the instance.

The instances can now read and write data in the EFS file system as if it were stored locally. All other instances with access to the EFS file system will see the changes. The file system grows and shrinks automatically as files are added or removed.

Additional instances can be added to the file system at any time by creating and attaching the mount target in the appropriate AZ.

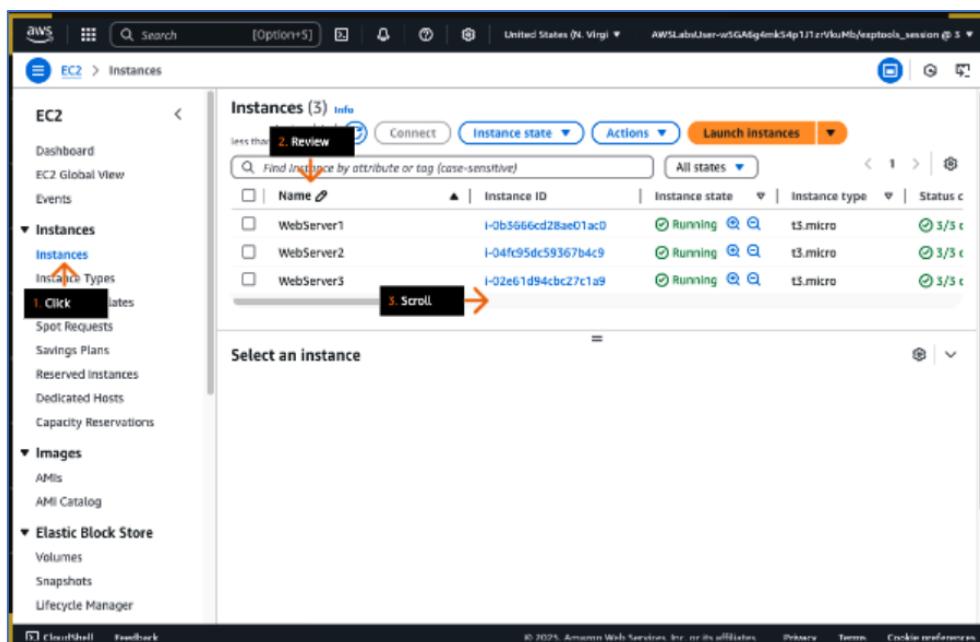
## Steps / Procedures / Instructions:

- In the top navigation bar search box, type: ec2
- In the search results, under Services, click EC2.



- In the left navigation pane, click Instances.
- In the Instances section, review the names of the three existing instances.
- To review all of the details, scroll to the right.

Amazon Elastic Compute Cloud (Amazon EC2) provides on-demand, scalable computing capacity in the AWS Cloud. Using Amazon EC2 reduces hardware costs so you can develop and deploy applications faster. You can use Amazon EC2 to launch as many or as few virtual servers as you need, configure security and networking, and manage storage.



- Under Availability Zone, review the AZ for each instance.
- In the left navigation pane, under Network & Security, click Security Groups.

Availability Zones (AZs) are identified by a letter identifier following the Region code (for example, us-east-1a). AZs are connected through low-latency fiber networks within the same Region.

Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS	Pu
t3.micro	5/5 checks passed	View alarms +	us-east-1a	ec2-100-26-146-87.co...	10
t3.micro	5/5 checks passed	1 Review	us-east-1b	ec2-54-224-15-145.co...	54
t3.micro	5/5 checks passed	View alarms +	us-east-1c	ec2-3-237-99-147.com...	3.2

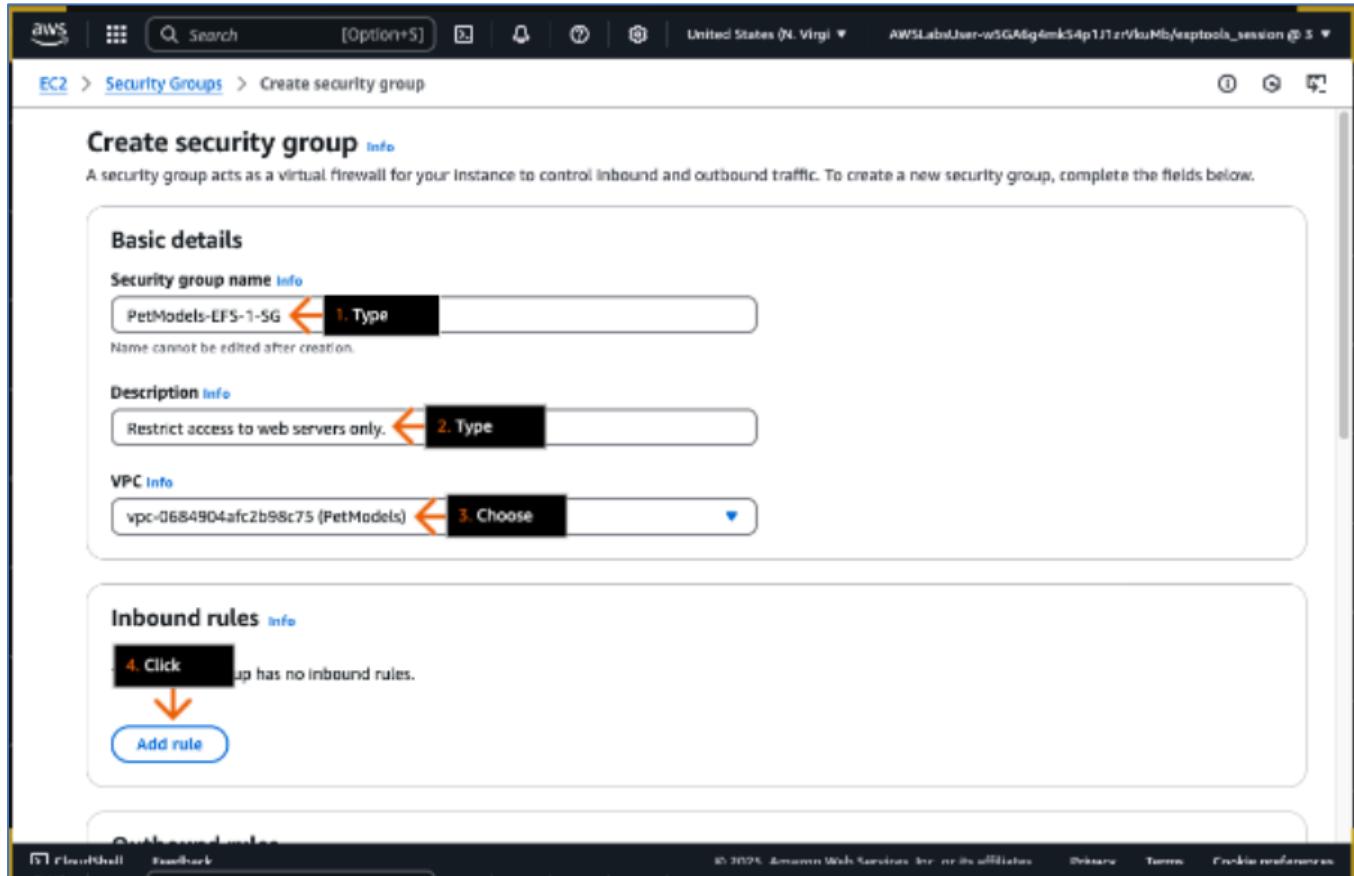
- In the Security Groups section, review the Web\_Server\_SG security group.
  - The webserver security group is already linked to the web servers.
- Click Create security group.

Each EC2 instance must belong to at least one security group, and the security group policy controls the traffic for instances within that group.

Name	Security group ID	Security group name	VPC
Web_Server_SG	sg-0eb8c4c45f691221c	webserver	VPC-1
-	sg-0c8de36b50216db6	default	VPC-1
-	sg-dae50b99eaecd19	default	VPC-1
-	sg-d9be1a9c86a714db	GuardDutyManagedSecurityGroup-vpc...	VPC-1

- For Security group name, type: PetModels-EFS-1-SG
- For Description, type: Restrict access to web servers only.
- For VPC, on the dropdown list, choose the PetModels VPC.
  - You might need to remove the existing VPC by clicking X.
- In the Inbound rules section, click Add rule.

Security groups are linked to a single Virtual Private Cloud (VPC). You can assign a security group to one or more EC2 instances, but each instance must be in the same VPC as the security group.



- To configure the new rule, for Type, choose NFS.
- Under Source, click to expand the dropdown list.
- Choose the webserver security group.
- Scroll down to the bottom of the page, and then click Create security group

Amazon Elastic File System (Amazon EFS) file systems require an inbound NFS rule. By selecting a security group as the incoming source, any EC2 instances linked to the security group you select will have NFS client access to the file system.

Inbound rules [Info](#)

Inbound rule 1

Type <a href="#">Info</a> NFS	Protocol <a href="#">Info</a> TCP	Port range <a href="#">Info</a> 2049
Source type <a href="#">Info</a> Custom	Source <a href="#">Info</a> <input type="text"/>	Description - optional <a href="#">Info</a>

Add rule

Outbound rules [Info](#)

Outbound rule 1

Type <a href="#">Info</a> All traffic	Destination type <a href="#">Info</a> Custom	Description - optional
--	---	------------------------

3. Choose

4. Scroll

- Under Security group name, review the name.
- On the Inbound rules tab, review the newly created rule.

Changes to security group rules take effect immediately, and are stateful, meaning if inbound traffic is allowed, the corresponding outbound traffic is automatically permitted.

Security group (sg-03077fc56a1b0d393 | PetModels-EFS-1-SG) was created successfully

Details

sg-03077fc56a1b0d393 - PetModels-EFS-1-SG

Actions

1. Review

2. Review

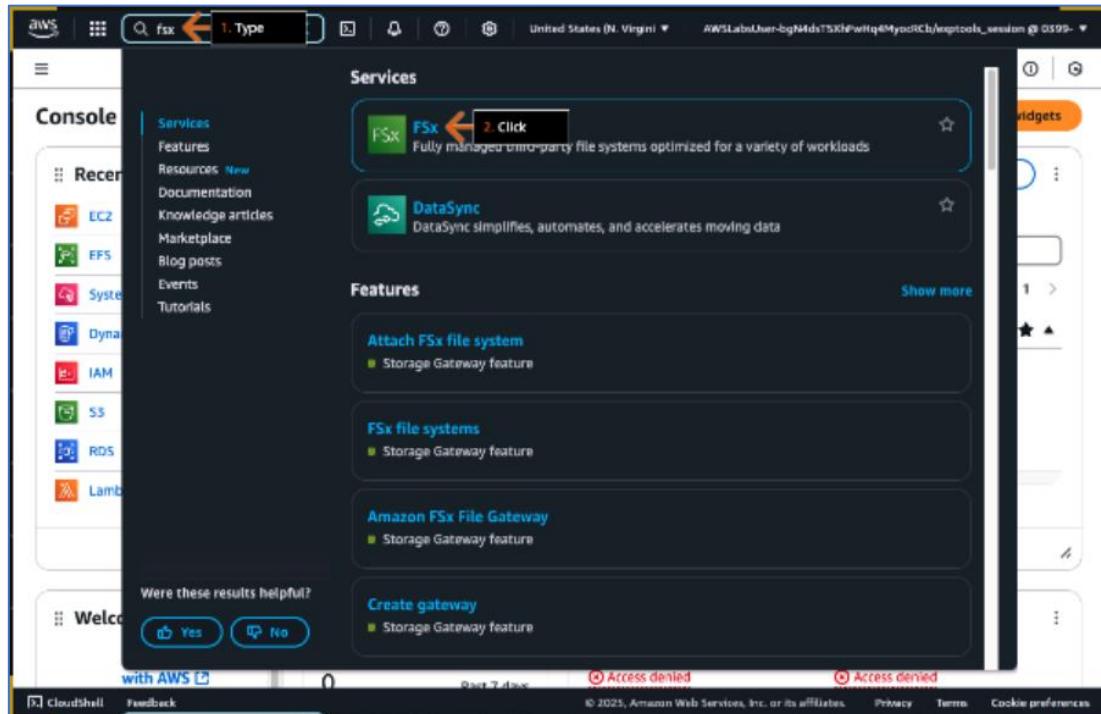
Security group name	Security group ID	Description	VPC ID
PetModels-EFS-1-SG	sg-03077fc56a1b0d393	Restrict access to web servers only.	vpc-0684904afc2b98c75
Owner	Inbound rules count	Outbound rules count	
388868885960	1 Permission entry	1 Permission entry	

Inbound rules    Outbound rules    Sharing - new    VPC associations - new    Tags

Inbound rules (1)

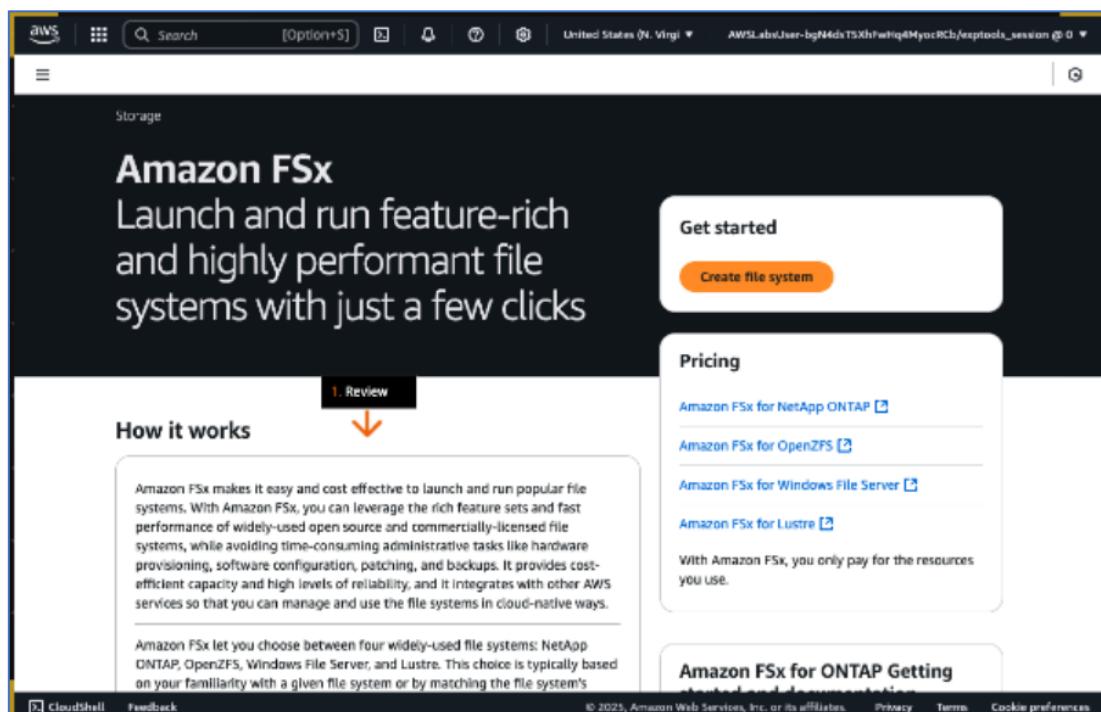
Name	Security group rule ID	IP version	Type	Protocol	Port
sgr-093bdac0b3d6a859d	-	-	NFS	TCP	2049

- In the top navigation bar search box, type: fsx
- In the search results, under Services, click FSx.



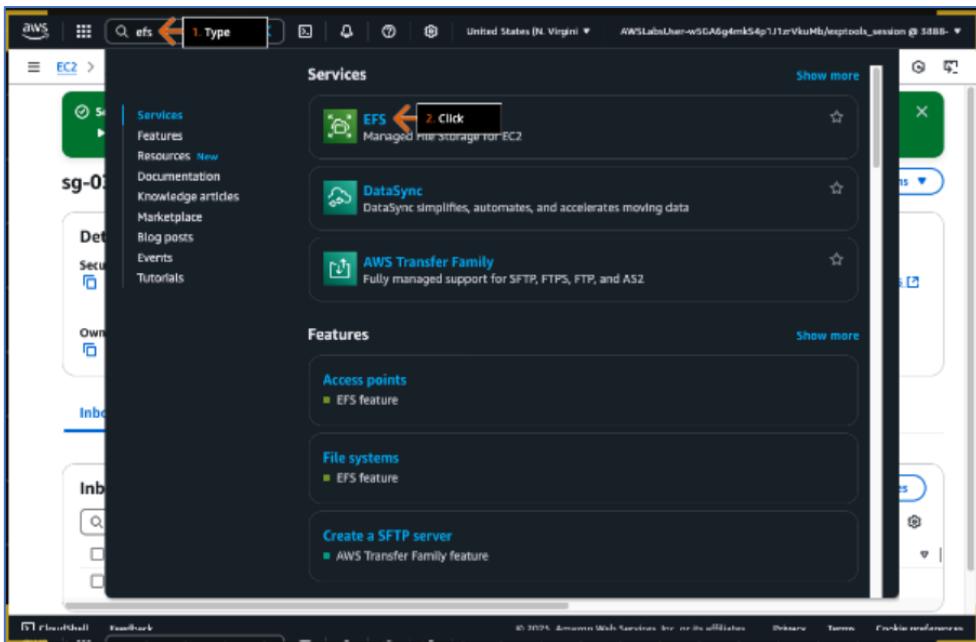
- On the Amazon FSx console home page, review the information and descriptions.

Amazon FSx file systems support industry-standard protocols that offer connectivity to Linux, Windows, and macOS users and applications. Amazon FSx also delivers sub-millisecond latencies and high throughput to meet the performance needs of your most demanding workloads.



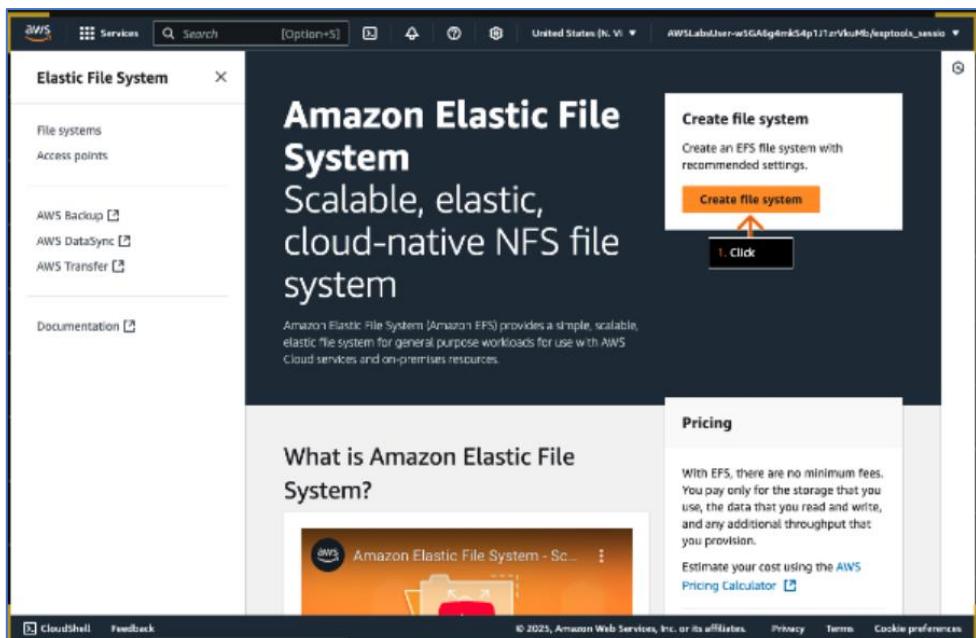
- In the top navigation bar search box, type: efs
- In the search results, under Services, click EFS.

Amazon EFS provides a serverless, set-and-forget elastic file system that you can use to share file data without provisioning or managing storage. Amazon EFS is built to scale on demand, up to petabytes of storage capacity, without disrupting applications. Using Amazon EFS, you can grow and shrink your file systems automatically as you add and remove files, removing the need to provision and manage capacity to accommodate growth.



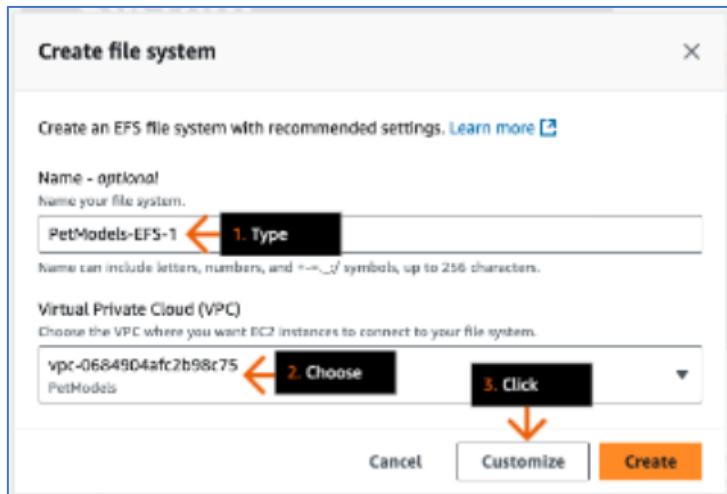
- On the Amazon EFS console home page, click Create file system.

Amazon EFS creates a shared storage file system that is available concurrently to multiple instances in Amazon EC2.



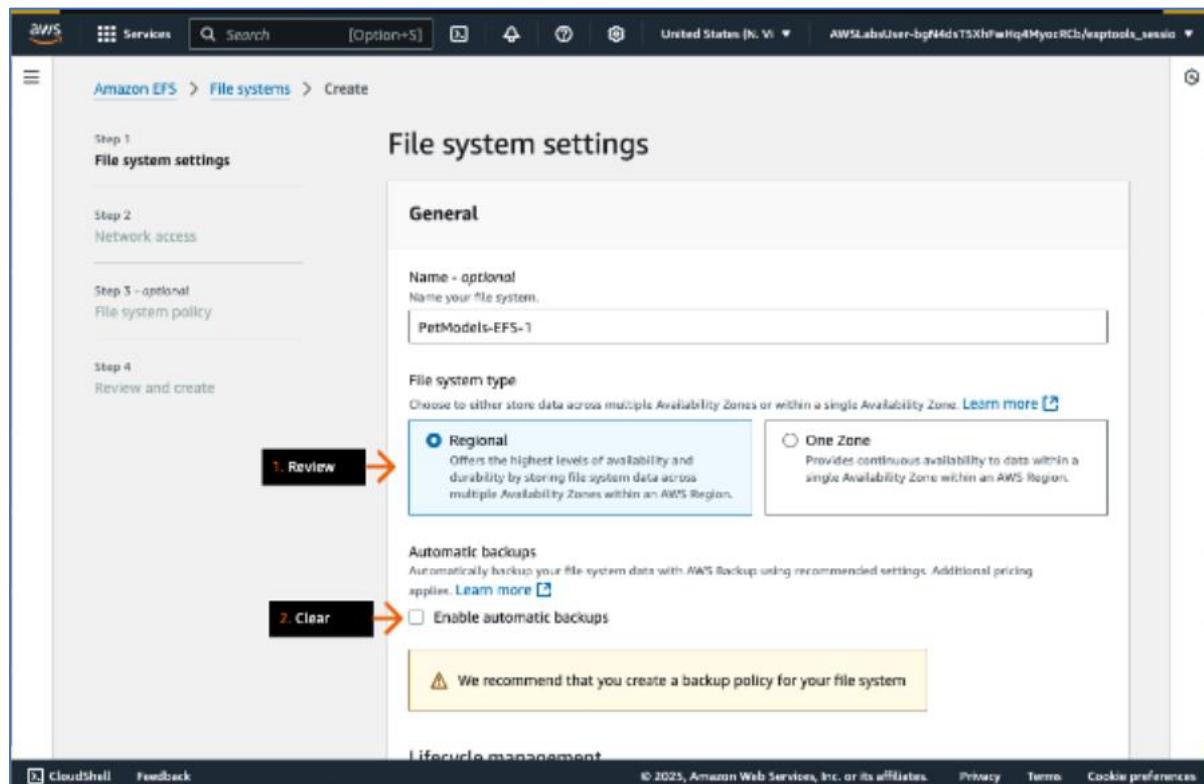
- In the pop-up box, for Name, type: PetModels-EFS-1
- For VPC, choose the PetModels VPC.
- Click Customize.

By default, EC2 instances must be in the same VPC as the EFS file system.



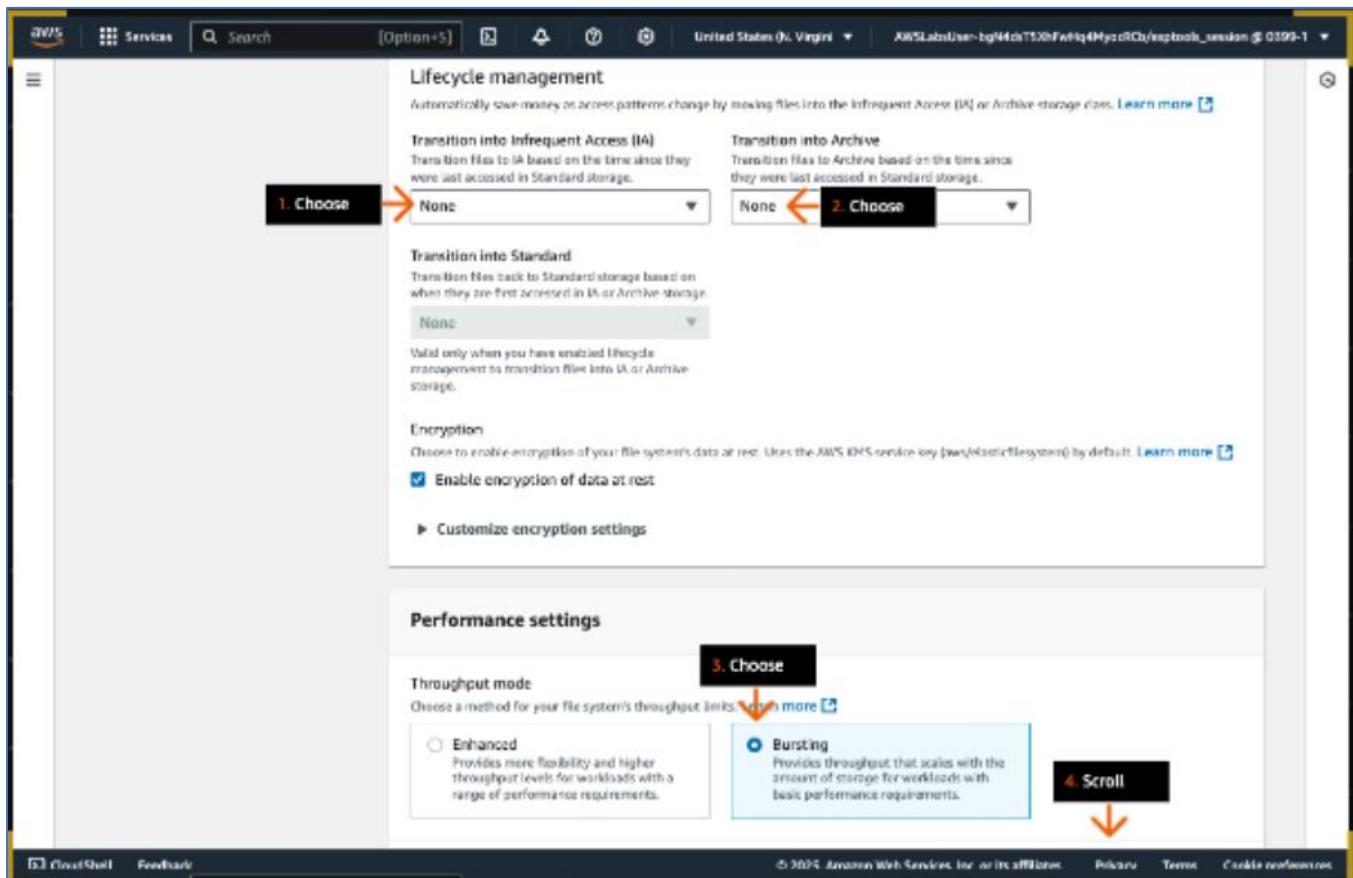
- In the File system settings step, under File system type, review the types.
- Clear the checkbox to deselect Enable automatic backups.

You can choose to use Regional or One Zone storage classes in Amazon EFS. Regional class stores data within and across multiple Availability Zones. One Zone class stores data redundantly within a single AZ, at a lower price than Regional, for workloads that don't require multi-AZ resilience.



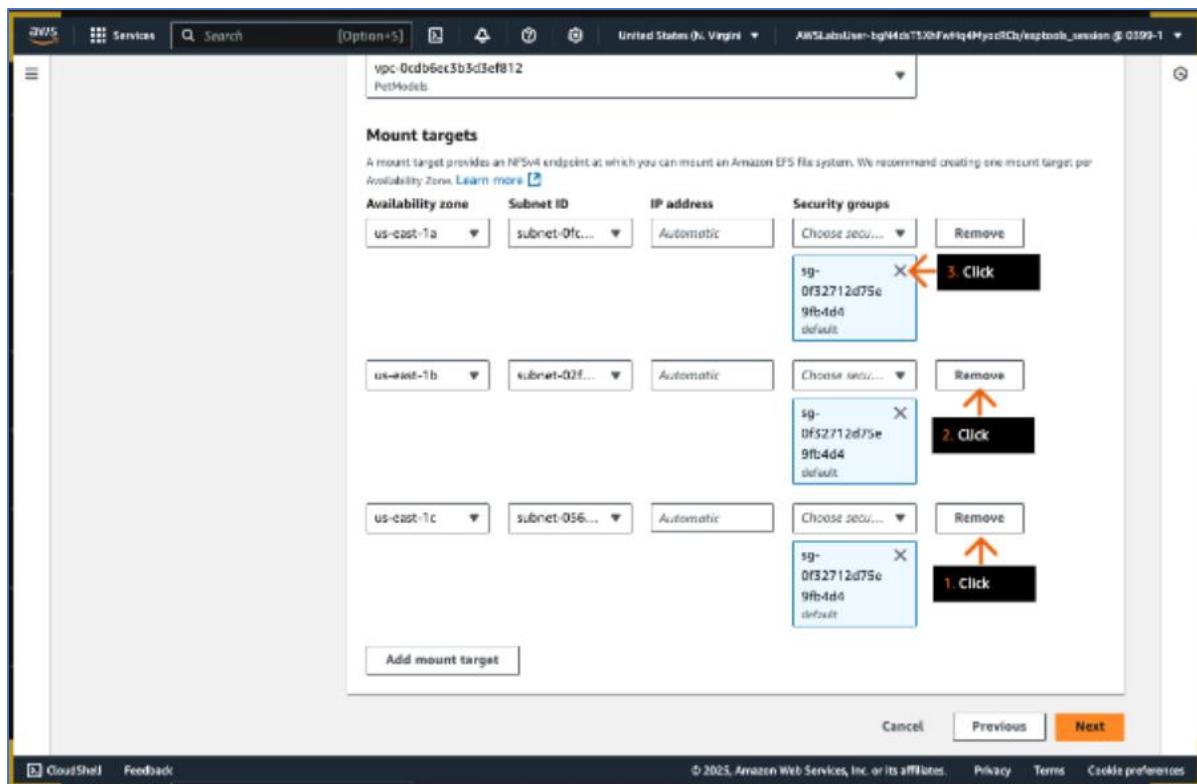
- Under Lifecycle management, for Transition into Infrequent Access (IA), choose None.
  - Infrequent Access storage class is designed for storing long-lived, infrequently accessed files in a cost-effective manner.
- For Transition into Archive, choose None.
  - The Archive storage class is designed for data that is accessed very infrequently — only a few times per year or less.
- For Throughput mode, choose Bursting.
- Scroll down to the bottom of the page, and then click Next.

You can manage your file systems so that they have cost-effective storage throughout their lifecycle. Use lifecycle management to automatically transition data between storage classes according to the lifecycle configuration for the file system.



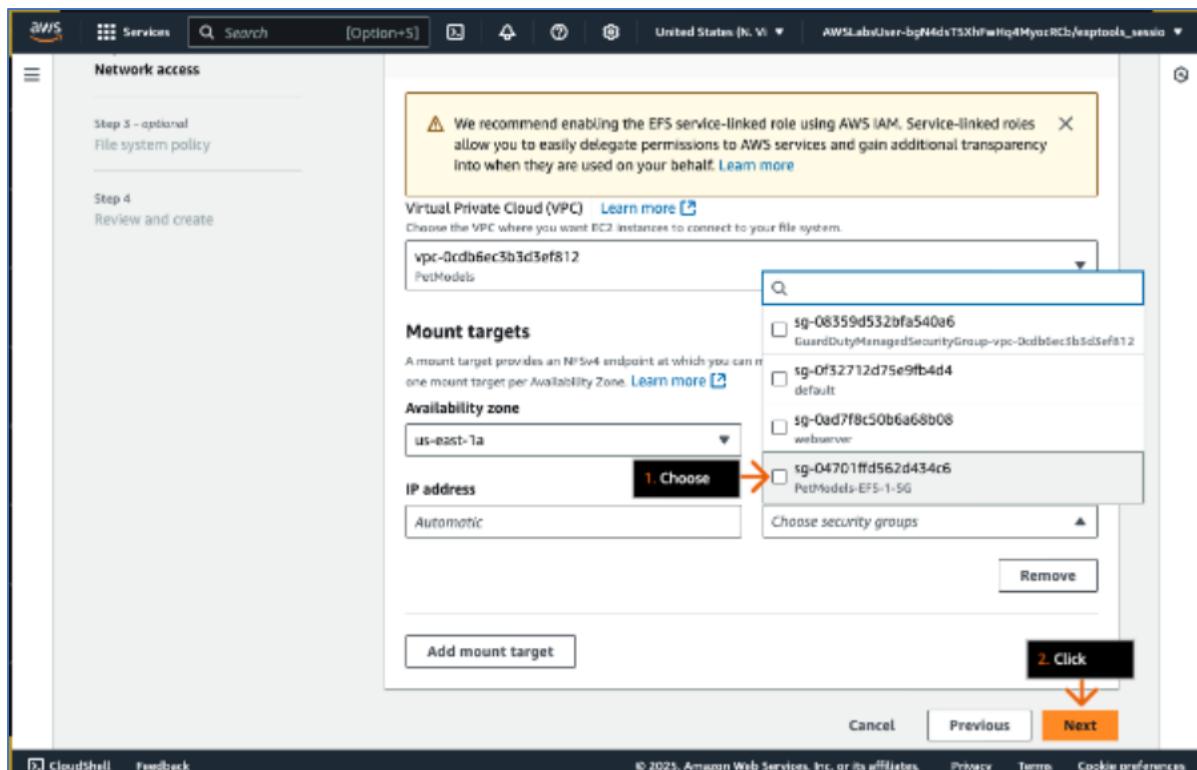
- In the Network access step, to remove the subnet, under Mount targets, for AZ us-east-1c, click Remove.
- For AZ us-east-1b, click Remove.
- To remove the security group, for AZ us-east-1a, under Security groups, click the X in the displayed security group.

After creating the EFS file system, you create mount targets on each subnet. The mount target enables communication from EC2 instances on the subnet. Amazon EFS uses the Network File System (NFSv4) protocol. EC2 instances that connect to the file system are NFS clients.

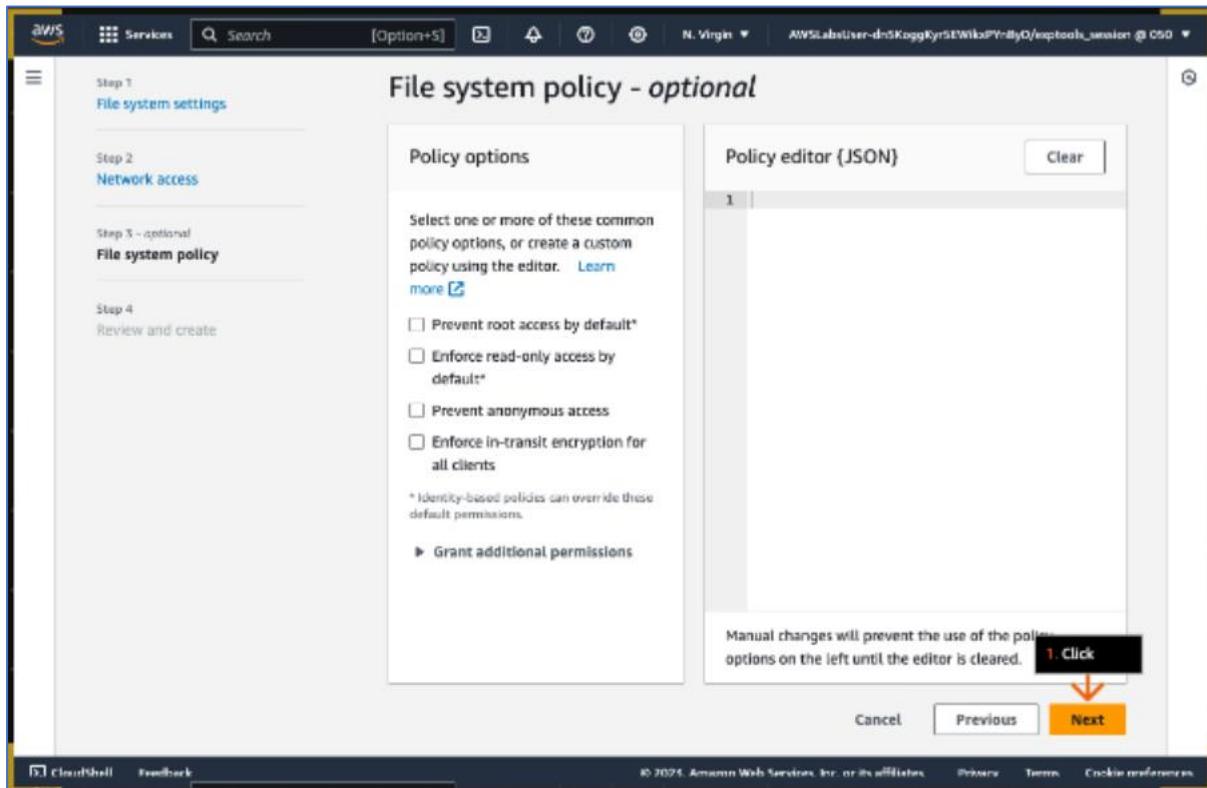


- For AZ us-east-1a, under Security group, choose the PetModels-EFS-1-SG security group.
- Click Next.

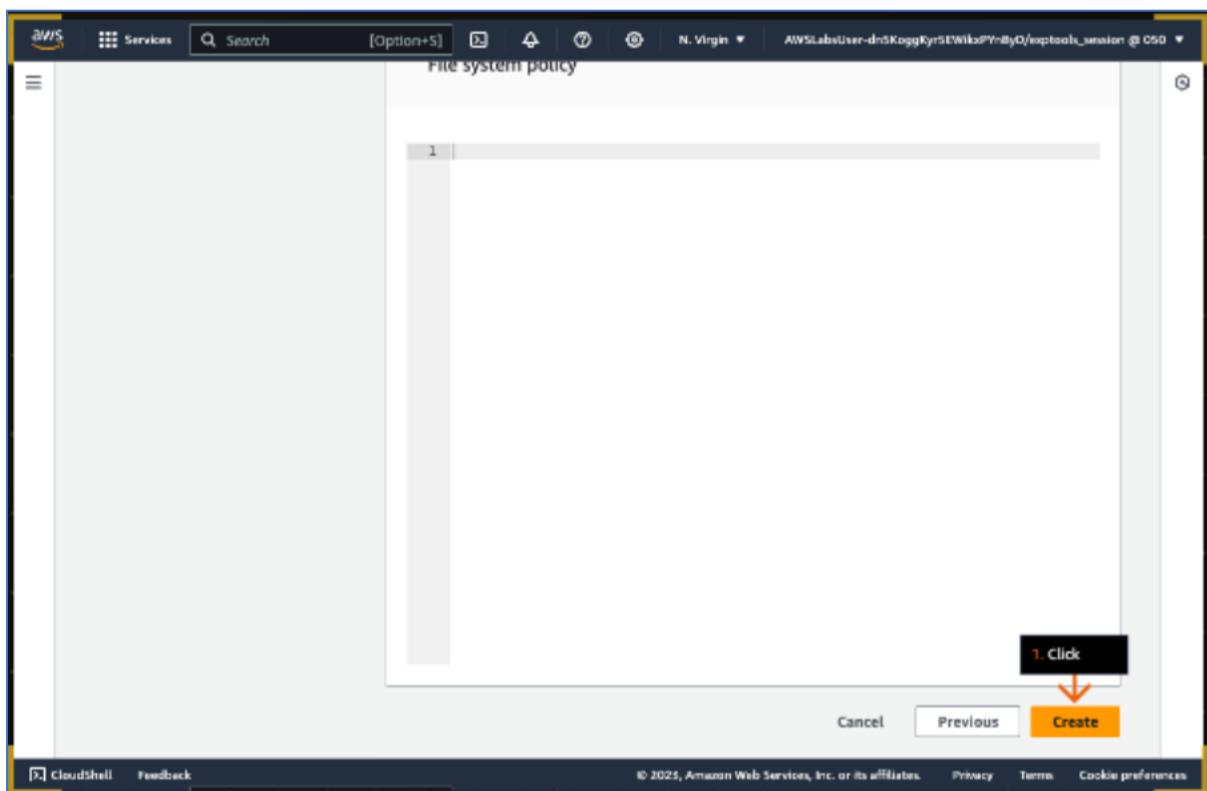
By attaching your custom security group to the mount target, you control where the source of incoming traffic to the file system can originate.



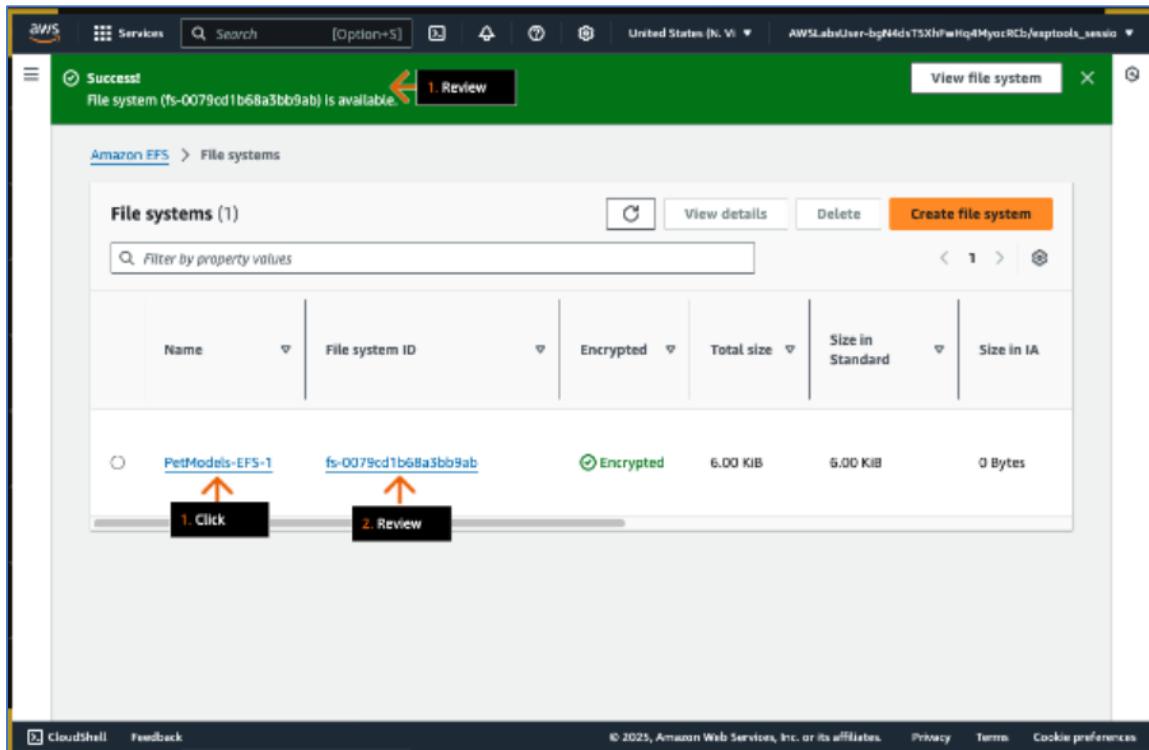
- In the File system policy step, click Next.



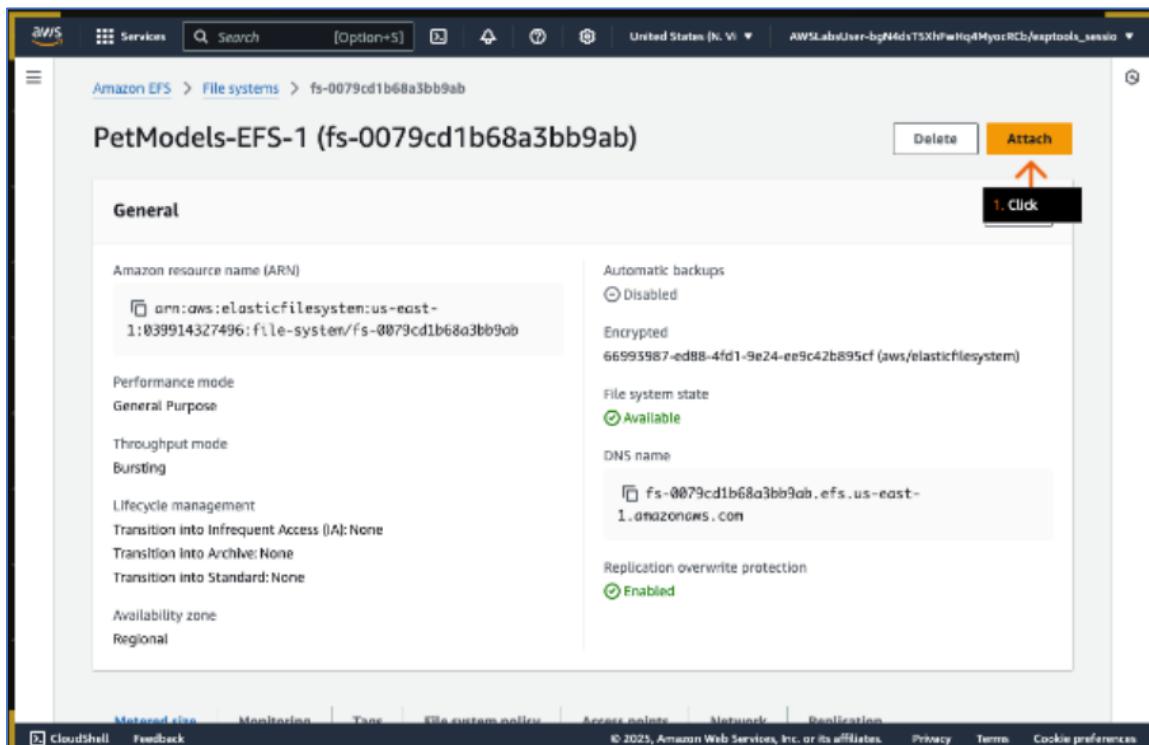
- In the Review and create step, at the bottom of the page, click Create.



- In the success alert, review the message.
  - If an iam:CreateServiceLinkedRole error alert appears, you can safely ignore it.
- Under File system ID, review the provided ID.
  - You must use this ID in the later DIY section of this solution.
- Click PetModels-EFS-1.

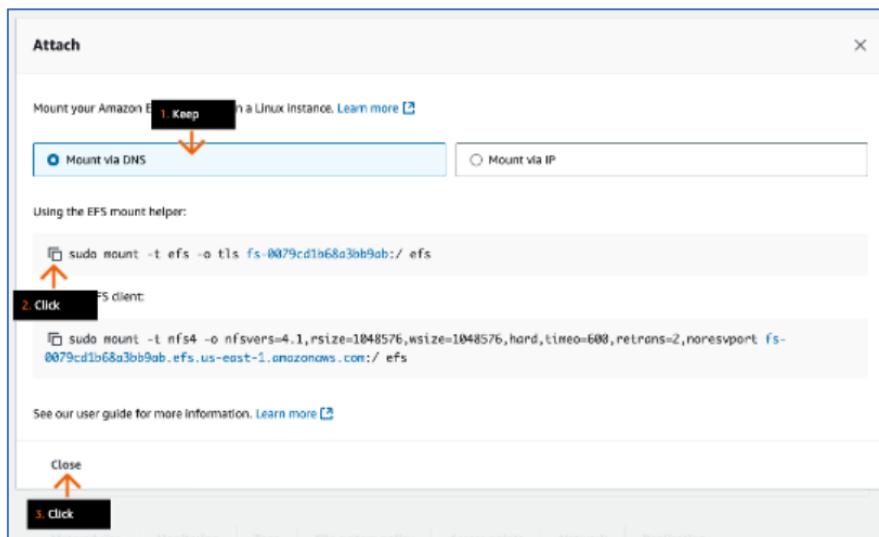


- Click Attach.



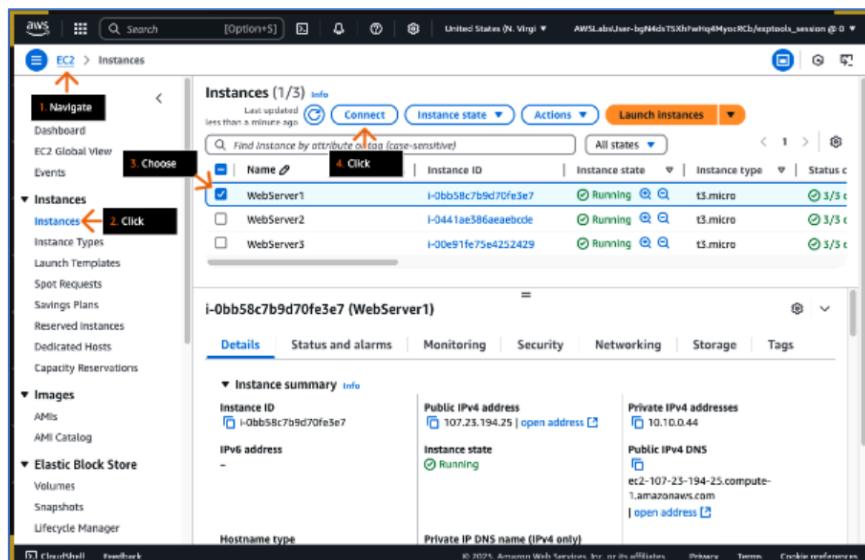
- In the pop-up box, keep the default choice of Mount via DNS.
- Under Using the EFS mount helper, click the copy icon to copy the mount command, and then paste it in the text editor of your choice on your device.
  - You use this command in later steps.
- Click Close.

To set up an EFS mount on an Amazon Linux system, install the EFS mount helper, and then run the mount command.



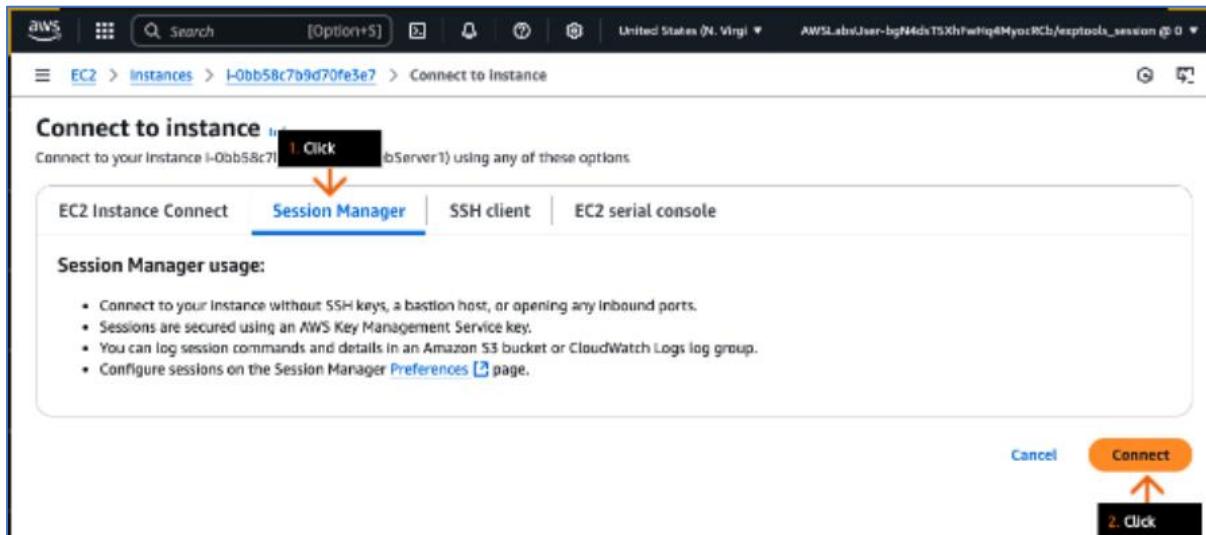
- Navigate to the Amazon EC2 console.
  - Remember, on the top navigation bar, you can use the Services search box (or click Services) to navigate to a different service console.
- In the left navigation pane, click Instances.
- In the Instances section, choose the checkbox to select WebServer1.
- Click Connect.

To connect to an instance, Amazon EC2 supports SSH, Session Manager (a capability of AWS Systems Manager), or Amazon EC2 Instance Connect.



- Click the Session Manager tab.
- Click Connect.
  - The Session Manager terminal opens in a new browser tab (or window). Keep the current browser tab open.

Session Manager provides secure and auditable node management without the need to open inbound ports, maintain bastion hosts, or manage SSH keys. Using Session Manager, you also comply with corporate policies that require controlled access to managed nodes, strict security practices, and fully auditable logs with node access details, while providing end users with one-click, cross-platform access to your managed nodes.



- In the terminal, at the command prompt, run (type the command and press Enter):

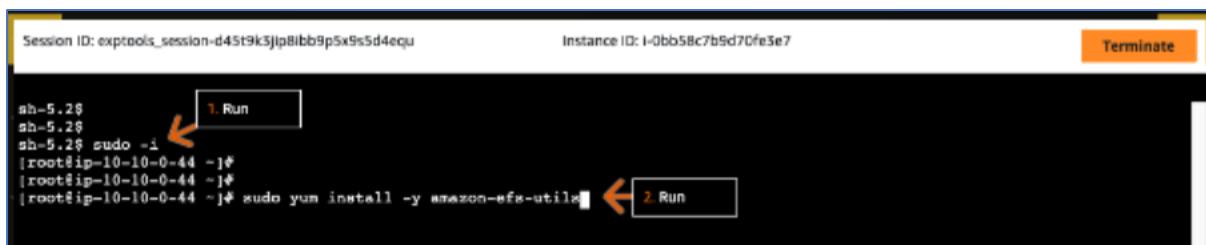
```
sudo -i
```

- In the terminal, run:

```
sudo yum install -y amazon-efs-utils
```

- You can also copy-paste this text. If you receive an undefined value when you paste this, try again.

The Amazon EFS client software (amazon-efs-utils) is an open-source collection of Amazon EFS tools and is used to attach and access the file system. This package is available in the Amazon Linux package repositories and can be built and installed on other Linux distributions.



- Review the packages installed from the previous yum command.

Session ID: exptools\_session-d45t9k5jlp8bb9p5x9s5d4ecu      Instance ID: i-0bb58c7b5d70fe3e7      [Terminate](#)

```

Dependencies resolved.
=====
Package          Architecture Version      Repository  Size
=====
Installing:
amazon-efs-utils        x86_64    2.1.0-1.amzn2023   amazonlinux  1.2 M
Installing dependencies:
stunnel                x86_64    5.58-1.amzn2023.0.2  amazonlinux  156 k

Transaction Summary
=====
Install 2 Packages

Total download size: 1.4 M
Installed size: 4.5 M
Downloading Packages:
(1/2): stunnel-5.58-1.amzn2023.0.2.x86_64.rpm  1.9 MB/s | 156 kB     00:00
(2/2): amazon-efs-utils-2.1.0-1.amzn2023.x86_64.rpm 11 MB/s | 1.2 MB     00:00

Total                                         7.8 MB/s | 1.4 MB     00:00
Running transaction check
Transaction check succeeded.
Running transaction test
Transaction test succeeded.
Running transaction
Preparing                           1/1
Installing : stunnel-5.58-1.amzn2023.0.2.x86_64 1/2
Running scriptlet: stunnel-5.58-1.amzn2023.0.2.x86_64 1/2
Installing : amazon-efs-utils-2.1.0-1.amzn2023.x86_64 2/2
Running scriptlet: amazon-efs-utils-2.1.0-1.amzn2023.x86_64 2/2
Verifying   : amazon-efs-utils-2.1.0-1.amzn2023.x86_64 1/2
Verifying   : stunnel-5.58-1.amzn2023.0.2.x86_64 2/2

Installed:
amazon-efs-utils-2.1.0-1.amzn2023.x86_64           stunnel-5.58-1.amzn2023.0.2.x86_64

Complete!
[root@ip-10-10-0-44 ~]#

```

- In this step, you use Linux commands to create a data directory. You then mount the newly created EFS file system to that directory. You create a log file and append information to it. The log file and its contents are visible from other instances that have the same file system mounted.
  
- In the terminal, run: **mkdir data**
  - If you receive a Permission Denied alert, run the following command, and then repeat the previous command: **cd ~**
- In the terminal, paste the sudo mount command that you copied from the Amazon EFS console in an earlier step.
- At the end of the pasted command, replace the "efs" folder name with "data" (without quotes) and press Enter.
- In the terminal, run: **cd data**
- To create a log file, run: **sudo bash -c "cat >> efs-1-setup.log"**
  - No output is displayed. Instead, the cursor moves to a new line and waits for your next input.
- In the terminal, type: **efs-1 mounted in site A**
- To end the cat session, on your keyboard, press Ctrl+C.
- To view the log file contents, run: **cat efs-1-setup.log**

Session ID: exptools\_session-d45t9k5j08lbb9p5x9s5d4equ      Instance ID: i-0bb58c7b9d70fe3e7

Terminate

```
[root@ip-10-10-0-44 ~]# 1. Run
[root@ip-10-10-0-44 ~]# 2. Paste
[root@ip-10-10-0-44 ~]# mkdir data
[root@ip-10-10-0-44 ~]# 3. Replace
[root@ip-10-10-0-44 ~]# sudo mount -t efs -o tls fs-0079cd1b68a3bb9ab:/ data
[root@ip-10-10-0-44 ~]# 4. Run
[root@ip-10-10-0-44 data]# 5. Run
[root@ip-10-10-0-44 data]# sudo bash -c "cat >> efs-1-setup.log"
[root@ip-10-10-0-44 data]# 6. Type
^C
[root@ip-10-10-0-44 data]# 7. Press
[root@ip-10-10-0-44 data]# cat efs-1-setup.log 8. Run
[root@ip-10-10-0-44 data]# 8. Run
[root@ip-10-10-0-44 data]# 9. Run
[root@ip-10-10-0-44 data]# 10. Run
[root@ip-10-10-0-44 data]# 11. Run
[root@ip-10-10-0-44 data]# 12. Run
[root@ip-10-10-0-44 data]# 13. Run
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[root@ip-10-10-0-44 data]# 68. Run
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[root@ip-10-10-0-44 data]# 91. Run
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[root@ip-10-10-0-44 data]# 93. Run
[root@ip-10-10-0-44 data]# 94. Run
[root@ip-10-10-0-44 data]# 95. Run
[root@ip-10-10-0-44 data]# 96. Run
[root@ip-10-10-0-44 data]# 97. Run
[root@ip-10-10-0-44 data]# 98. Run
[root@ip-10-10-0-44 data]# 99. Run
[root@ip-10-10-0-44 data]# 100. Run

```

- In the other browser tab, navigate to the Amazon EFS console.
- In the File systems section, click PetModels-EFS-1.

File systems can be mounted on compute resources such as Amazon EC2, Amazon Elastic Container Service (Amazon ECS), and AWS Lambda.

Elastic File System 1. Click Amazon EFS > File systems

Name	File system ID	Encrypted	Total size
PetModels-EFS-1	fs-0079cd1b68a3bb9ab	Encrypted	12.00 KB

- Click the Network tab.
- Click Manage.

Access to the file system is provided through the NFS protocol.

**General**

Amazon resource name (ARN): arn:aws:elasticfilesystem:us-east-1:639914327496:file-system/fs-0079cd1b68a3bb9ab

Automatic backups: Disabled

Encrypted: Yes

File system state: Available

DNS name: fs-0079cd1b68a3bb9ab.efs.us-east-1.amazonaws.com

Replication overwrite protection: Enabled

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

**Network**

- Under Mount targets, click Add mount target.

A mount target serves as an endpoint in a VPC that enables access to the EFS file system.

Amazon EFS > File systems > fs-0079cd1b68a3bb9ab > Network access

**Network**

**Virtual Private Cloud (VPC)**  
Choose the VPC where you want EC2 instances to connect to your file system.  
vpc-0cd86e3b3d5ef812  
PetModels

You must delete all existing mount targets in order to change the VPC of your file system.

**Mount targets**

A 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](#)

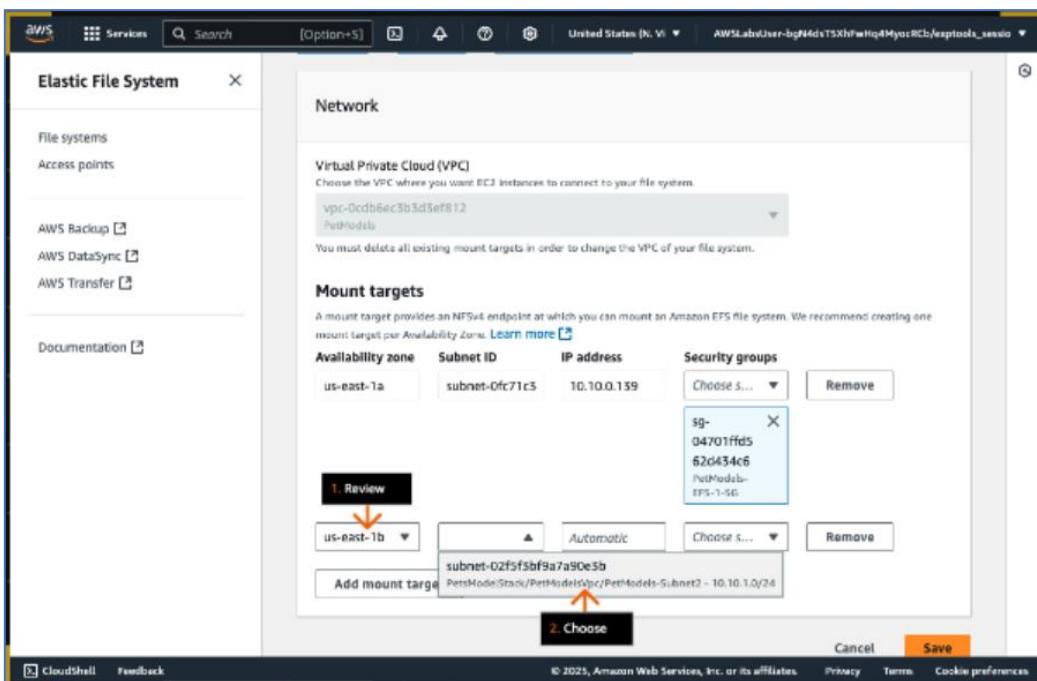
Availability zone	Subnet ID	IP address	Security groups
us-east-1a	subnet-0fc71c3	10.10.0.139	Choose... Remove sg-04701ffd5 sg-02d45ac6 PetModels-EFS-1-SG

1. Click  
↓  
Add mount target

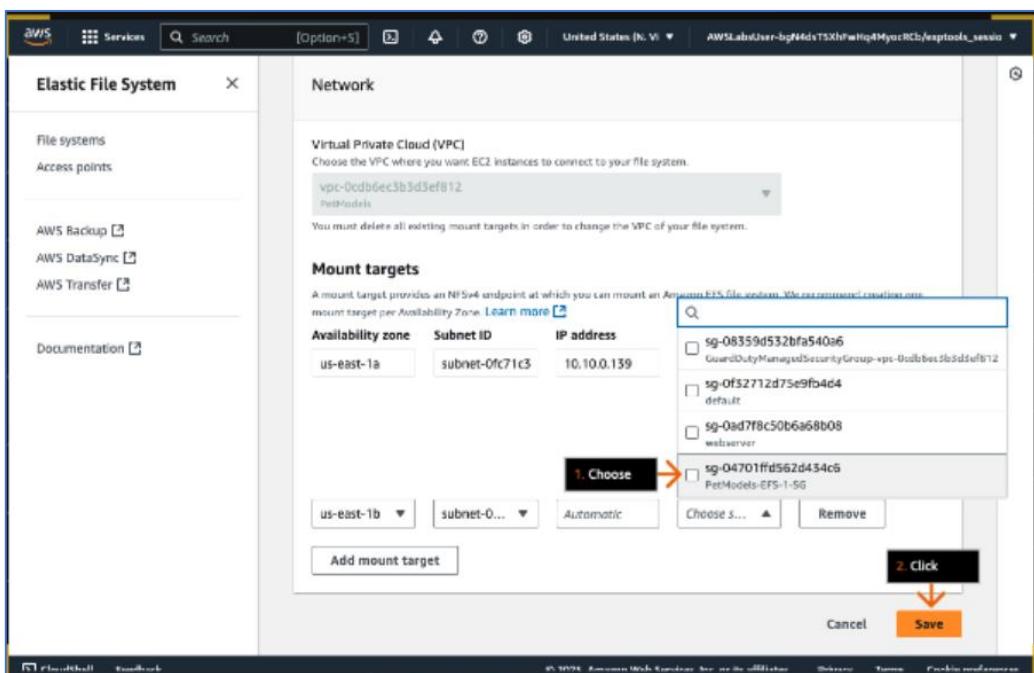
- For Availability zone, review to confirm that us-east-1b is selected.

- For Subnet ID, choose PetModels-Subnet2.

You can create mount targets for a file system by using the AWS Management Console, AWS Command Line Interface (AWS CLI), or by programmatically using the AWS SDKs. When using the console, you can create mount targets when you first create a file system or after the file system is created.



- For Security groups, choose PetModels-EFS-1-SG.
- Click Save.
  - If the "User is not authorized to perform that action on the specified resource" error alert appears, you can safely ignore it.



- After a few minutes, on the Network tab, click the refresh icon.
- For the new mount target, under Mount target state, review to confirm that the state is Available.
  - Wait for the state to change before proceeding.

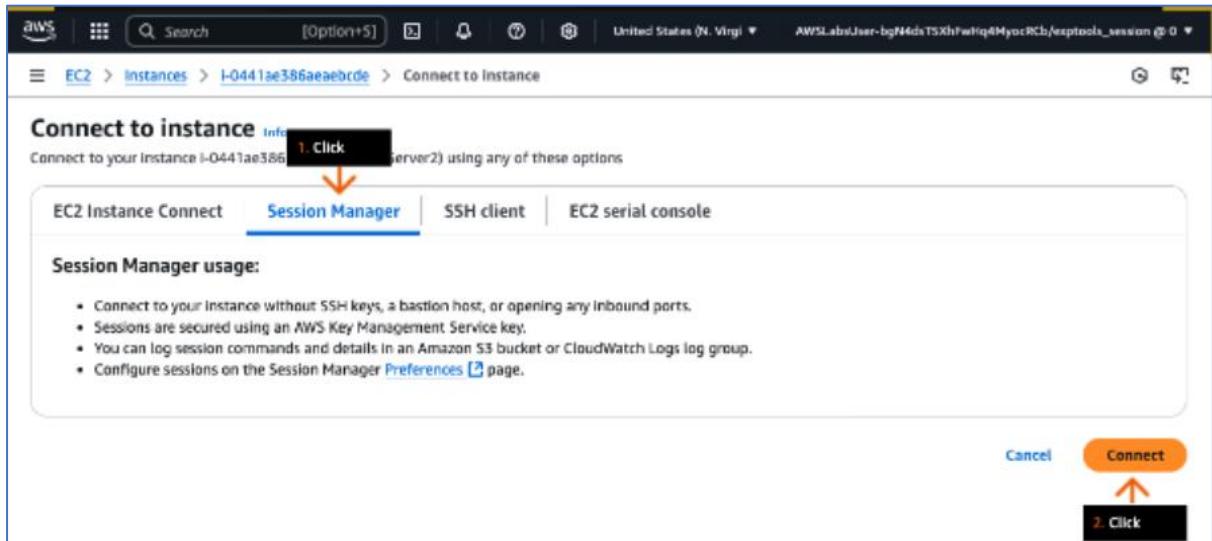
Each mount target installs an elastic network interface (ENI) into the chosen subnet. An ENI is a logical networking component in a VPC that represents a virtual network card. The ENI automatically receives an IP address from the VPC.

Availability zone (AZ-ID)	Mount target ID	Subnet ID	Mount target state	IP address	Network interface ID
us-east-1a (use1-az4)	fsmnt-0513254a613b586fb	subnet-0fc71c3daf9390983	Available	10.10.0.139	eni-0cd0400a7b6da33502
us-east-1b (use1-az6)	fsmnt-0a5ccbe07694112f2	subnet-02f5f5bf9a7a90e3b	Available	10.10.1.128	eni-0fa9d0f4d1e4771d8

- Navigate to the Amazon EC2 console.
- In the left navigation pane, click Instances.
- In the Instances section, choose the checkbox to select WebServer2.
- Click Connect.

Name	Instance ID	Instance state	Instance type	Status
WebServer1	i-0bb58c7b9d70fe3e7	Running	t3.micro	5/5
<b>WebServer2</b>	<b>i-0441ae386aeaebcde</b>	<b>Running</b>	<b>t3.micro</b>	<b>3/3</b>
WebServer3	i-0e91fe75e4252429	Running	t3.micro	3/3

- Click the Session Manager tab.
- Click Connect.



- In the terminal, run: `sudo -i`
- In the terminal, run: `sudo yum install -y amazon-efs-utils`

```

Session ID: exptools_session-2g8oajyvx3c57axs6cy7ydky74
Instance ID: i-0441ae386aeaebcde
Terminate

sh-5.2$ sh-5.2$ sudo -i
[root@ip-10-10-1-53 ~]# 1. Run
[root@ip-10-10-1-53 ~]# sudo yum install -y amazon-efs-utils
[2. Run]
Last metadata expiration check: 22:43:14 ago on Mon Feb 24 21:27:00 2023.
Dependencies resolved.

=====
Package           Architecture Version      Repository   Size
=====
Installing:
amazon-efs-utils        x86_64    2.1.0-1.amzn2023   amazonlinux  1.2 M
Installing dependencies:
stunnel                x86_64    5.58-1.amzn2023.0.2  amazonlinux  156 k

Transaction Summary
=====
Install 2 Packages

Total download size: 1.4 M
Installed size: 4.5 M
Downloading Packages:
(1/2): stunnel-5.58-1.amzn2023.0.2.x86_64.rpm          2.3 MB/s | 156 KB     00:00
(2/2): amazon-efs-utils-2.1.0-1.amzn2023.x86_64          15 MB/s | 1.2 MB     00:00

Total                                         11 MB/s | 1.4 MB     00:00

Running transaction check
Transaction check succeeded.
Running transaction test
Transaction test succeeded.
Running transaction
  Preparing           : 1/1
  Installing         : stunnel-5.58-1.amzn2023.0.2.x86_64 1/2
  Running scriptlet: stunnel-5.58-1.amzn2023.0.2.x86_64 1/2
  Installing         : amazon-efs-utils-2.1.0-1.amzn2023.x86_64 2/2
  Running scriptlet: amazon-efs-utils-2.1.0-1.amzn2023.x86_64 2/2
  Verifying          : amazon-efs-utils-2.1.0-1.amzn2023.x86_64 1/2
  Verifying          : stunnel-5.58-1.amzn2023.0.2.x86_64 2/2

```

- In this step, you create a data directory, mount your EFS file system to the data directory, and add entries to the existing log file.

- In the terminal, run: `mkdir data`

- If you receive a Permission Denied alert, run the following command, and then repeat the previous command: `cd ~`
- In the terminal, paste the sudo mount command that you copied from the Amazon EFS console in an earlier step.
- At the end of the pasted command, replace the "efs" folder name with "data" (without quotes) and press Enter.
- In the terminal, run: `cd data`
- To create a log file, run: `sudo bash -c "cat >> efs-1-setup.log"`
  - Again, no output is displayed. Instead, the cursor moves to a new line and waits for your next input.
- In the terminal, type: **efs-1 mounted in site B**
- To end the cat session, on your keyboard, press Ctrl+C.

```

Session ID: exptools_session-2g8oajyvx3c57axs6cy7yxky74
Instance ID: i-0441ae586aeaeabcde
Terminate

[root@ip-10-10-1-53 ~]# mkdir data
[root@ip-10-10-1-53 ~]# 
[root@ip-10-10-1-53 ~]# sudo mount -t efs -o tls fs-0079cd1b68a3bb9ab:/ data
[root@ip-10-10-1-53 ~]# 
[root@ip-10-10-1-53 ~]# 
[root@ip-10-10-1-53 ~]# 4. Run
[root@ip-10-10-1-53 ~]# cd data
[root@ip-10-10-1-53 data]# 
[root@ip-10-10-1-53 data]# 
[root@ip-10-10-1-53 data]# sudo bash -c "cat >> efs-1-setup.log"
[root@ip-10-10-1-53 data]# 
efs-1 mounted in site B
^C
[root@ip-10-10-1-53 data]# 
7. Press

```

- To view the log file contents, run: `cat efs-1-setup.log`
- Review the two log entries.
  - The changes made in both WebServer1 and WebServer2 are in the `efs-1-setup.log` file.

```

Session ID: exptools_session-2g8oajyvx3c57axs6cy7yxky74
Instance ID: i-0441ae586aeaeabcde
Terminate

[root@ip-10-10-1-53 data]# 
[root@ip-10-10-1-53 data]# 
[root@ip-10-10-1-53 data]# cat efs-1-setup.log
1. Run
efs-1 mounted in site A
efs-1 mounted in site B
2. Review
[root@ip-10-10-1-53 data]#

```

- In the other browser tab, navigate to the Amazon EFS console.
- In the File systems section, click PetModels-EFS-1.

Elastic File System

File systems (1)

Name	File system ID	Encrypted	Total size
PetModels-EFS-1	fs-0079cd1b68a3bb9ab	Encrypted	12.00 KB

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- Click the Network tab.
- Click Manage.

Access to the file system is provided through the NFS protocol.

PetModels-EFS-1 (fs-0079cd1b68a3bb9ab)

General

Amazon resource name (ARN)	Automatic backups
arn:aws:elasticfilesystem:us-east-1:039914327496:file-system/fs-0079cd1b68a3bb9ab	Disabled
Performance mode	File system state
General Purpose	Available
Throughput mode	DNS name
Bursting	fs-0079cd1b68a3bb9ab.efs.us-east-1.amazonaws.com
Lifecycle management	Replication overwrite protection
Transition into Infrequent Access (IA): None	Enabled
Transition into Archive: None	
Transition into Standard: None	
Availability zone	
Regional	

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

Network

CloudShell Feedback

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- Under Mount targets, click Add mount target.

A mount target serves as an endpoint in a VPC that enables access to the EFS file system.

**Virtual Private Cloud (VPC)**  
Choose the VPC where you want EC2 instances to connect to your file system.  
vpc-0cd86ec3b3d3ef812  
PetModels

You must delete all existing mount targets in order to change the VPC of your file system.

**Mount targets**

A 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	Security groups
us-east-1a	subnet-0fc71c3	10.10.0.139	Choose security groups... Remove

1. Click Add mount target

sg-04701f65  
sg-d434c6  
PetModels-EFS-1-SG

- For Availability zone, review to confirm that us-east-1c is selected.
- For Subnet ID, choose PetModels-Subnet3.

**Virtual Private Cloud (VPC)**  
Choose the VPC where you want EC2 instances to connect to your file system.  
vpc-0fc42b9b9a9fdc3b  
PetModels

You must delete all existing mount targets in order to change the VPC of your file system.

**Mount targets**

A 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	Security groups
us-east-1a	subnet-0823995e75a29b62	10.10.0.83	Choose security groups... Remove
us-east-1b	subnet-02d2abd5f49217a2e	10.10.1.95	Choose security groups... Remove
us-east-1c	subnet-0f74a5b9f2f1...	Automatic	Choose security groups... Remove

Add mount target

- For Security groups, choose PetModels-EFS-1-SG.
- Click Save.

You must delete all existing mount targets in order to change the VPC of your file system.

**Mount targets**

A 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	Security groups
us-east-1a	subnet-0823995e75a29b62	10.10.0.83	<input checked="" type="checkbox"/> sg-092e86a8c2d520dfa PetModels-EFS-1-SG
us-east-1b	subnet-02d2abd5f49217a2e	10.10.1.95	<input type="checkbox"/> sg-0e79bd0cc451682e0 webservice <input type="checkbox"/> sg-0e60c05207f3b1632 default <input type="checkbox"/> sg-05fb7ea76d03f912a GuardDutyManagedSecurityGroup-vpc-0fc42b9b9a9fdfc3b
us-east-1c	subnet-0f74a5b9f2f1...	Automatic	<input type="checkbox"/> sg-092e86a8c2d520dfa PetModels-EFS-1-SG

Add mount target

Cancel Save

- After a few minutes, on the Network tab, click the refresh icon.
- For the new mount target, under Mount target state, review to confirm that the state is Available.
  - Wait for the state to change before proceeding.

Availability zone (AZ-ID)	Mount target ID	Subnet ID	Mount target state	IP address	Network interface ID	Security groups
us-east-1a (use1-az6)	fsmt-02099db6f158181a7	subnet-0823995e75a29b62	Available	10.10.0.83	eni-0aea5b2149b53b6d	sg-092e86a8c2d520dfa (PetModels-EFS-1-SG)
us-east-1b (use1-az1)	fsmt-0e37f249ceaf5f89d	subnet-02d2abd5f49217a2e	Available	10.10.1.95	eni-0928d7e2131b1f05b	sg-092e86a8c2d520dfa (PetModels-EFS-1-SG)
us-east-1c (use1-az2)	fsmt-008d9179f7345556e	subnet-0f74a5b9f2f1721bf	Available	10.10.2.161	eni-0222ed634453250cb	sg-092e86a8c2d520dfa (PetModels-EFS-1-SG)

- Navigate to the Amazon EC2 console.
- In the left navigation pane, click Instances.
- In the Instances section, choose the checkbox to select WebServer2.
- Click Connect.

Last updated less than a minute ago

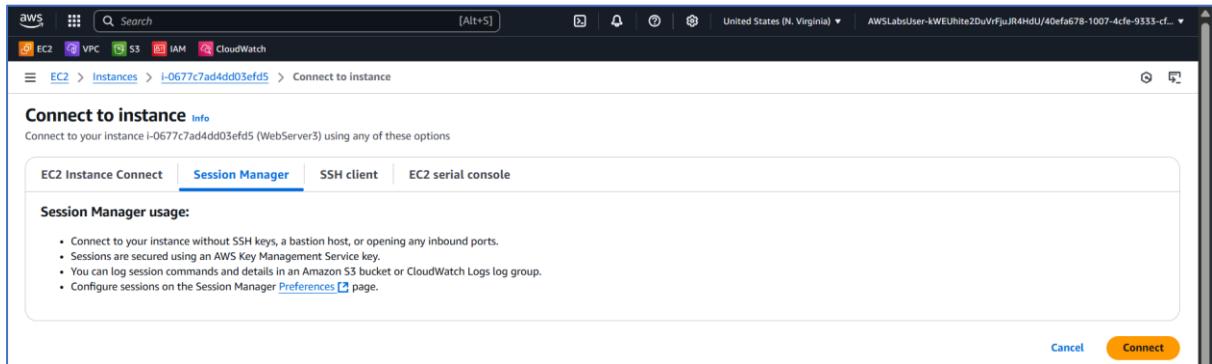
Instances (1/3) [Info](#)

Find Instance by attribute or tag (case-sensitive)

All states

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS
WebServer2	i-005a4ecf301aa1299	Running	t3.micro	3/3 checks passed	View alarms +	us-east-1b	ec2-44-195-42-64.co
WebServer3	i-0677c7ad4dd03efd5	Running	t3.micro	3/3 checks passed	View alarms +	us-east-1c	ec2-54-208-243-26.c
WebServer1	i-0e607f14c82299b4f	Running	t3.micro	3/3 checks passed	View alarms +	us-east-1a	ec2-107-21-88-246.c

- Click the Session Manager tab.
- Click Connect.



- In the terminal, run: `sudo -i`
- In the terminal, run: `sudo yum install -y amazon-efs-utils`

```
Session ID: 40efa678-1007-4cfe-9333-cf9563440388  Instance ID: i-0677c7ad4dd03ef5
4865n5ssqnzgjv8fxryzt5lq                                         [Terminate]

sh-5.2$ sudo -i
[root@ip-10-2-36-1]# sudo yum install -y amazon-efs-utils
Last metadata expiration check: 1:46:33 ago on Mon May  5 10:12:16 2025.
Dependencies resolved.

=====
| Package           | Architecture | Version      | Repository | Size
|=====             |             |             |            |
| Installing:      |             |             |            |
|   amazon-efs-utils | x86_64      | 2.3.0-1.amzn2023 | amazonlinux | 1.2 M
| Installing dependencies: |
|   stunnel         | x86_64      | 5.58-1.amzn2023.0.2 | amazonlinux | 156 k
| Transaction Summary |
|=====             |             |             |            |
| Install 2 Packages
| Total download size: 1.3 M
| Installed size: 4.2 M
| Downloading Packages:
| (1/2): stunnel-5.58-1.amzn2023.0.2.x86_64.rpm          3.7 MB/s | 156 kB    00:00
| (2/2): amazon-efs-utils-2.3.0-1.amzn2023.x86_64.rpm       15 MB/s | 1.2 MB    00:00
| Total
| Running transaction check
| Transaction check succeeded.
| Running transaction test
| Transaction test succeeded.
| Running transaction
|   Preparing      :                                                 1/1
|     Installing   : stunnel-5.58-1.amzn2023.0.2.x86_64          1/2
|     Running scriptlet: stunnel-5.58-1.amzn2023.0.2.x86_64
|     Installing   : amazon-efs-utils-2.3.0-1.amzn2023.x86_64      2/2
|     Running scriptlet: amazon-efs-utils-2.3.0-1.amzn2023.x86_64
|     Verifying     : amazon-efs-utils-2.3.0-1.amzn2023.x86_64      2/2
|     Verifying     : stunnel-5.58-1.amzn2023.0.2.x86_64          2/2
```

- In this step, you create a data directory, mount your EFS file system to the data directory, and add entries to the existing log file.

- In the terminal, run: `mkdir data`
  - If you receive a Permission Denied alert, run the following command, and then repeat the previous command: `cd ~`
- In the terminal, paste the sudo mount command that you copied from the Amazon EFS console in an earlier step.
- At the end of the pasted command, replace the "efs" folder name with "data" (without quotes) and press Enter.
- In the terminal, run: `cd data`
- To create a log file, run: `sudo bash -c "cat >> efs-1-setup.log"`
  - Again, no output is displayed. Instead, the cursor moves to a new line and waits for your next input.
- In the terminal, type: `efs-1 mounted in site C`
- To end the cat session, on your keyboard, press Ctrl+C.

```
Session ID: 40efa678-1007-4cfe-9333-cf9363440388- Instance ID: i-0677c7ad4dd03efd5  
4865n5ssqnzgуйv8jfrxyzt5lq  
  
[root@ip-10-10-2-36 ~]# mkdir data  
[root@ip-10-10-2-36 ~]# sudo mount -t efs fs-097b580b9dc3a4b40:/ data  
[root@ip-10-10-2-36 ~]# cd data  
[root@ip-10-10-2-36 data]# sudo bash -c "cat >> efs-1-setup.log"  
efs-1 mounted in site C  
^C  
[root@ip-10-10-2-36 data]#
```

- To view the log file contents, run: `cat efs-1-setup.log`
- Review the three log entries.
  - The changes made in both WebServer1, WebServer2 and WebServer3 are in the `efs-1-setup.log` file.

```
Session ID: 40efa678-1007-4cfe-9333-cf9363440388- Instance ID: i-0677c7ad4dd03efd5  
4865n5ssqnzgуйv8jfrxyzt5lq  
  
[root@ip-10-10-2-36 data]# cat efs-1-setup.log  
efs-1 mounted in site A  
efs-1 mounted in site B  
efs-1 mounted in site C  
[root@ip-10-10-2-36 data]#
```

## Conclusion:

"Congratulations! You have successfully deployed a multi-server accessible file system using Amazon EFS, as confirmed by the following:"

- **Amazon EFS Configuration:** The Amazon Elastic File System has been successfully configured.
- **Mount Target Deployment:** A mount target for the pet client photos repository has been successfully created.
- **Verification of Multi-Server Access:** As demonstrated by the access from at least three Amazon EC2 instances across different subnets, the file system infrastructure is successfully deployed and accessible from multiple servers, fulfilling the requirement for a shared and scalable storage solution.