

# VASAVI COLLEGE OF ENGINEERING

AUTONOMOUS  
(Affiliated to Osmania University)  
Hyderabad- 500 031.

DEPARTMENT OF : Computer Science and Engineering  
NAME OF THE LABORATORY : DSCC LAB

Name : \_\_\_\_\_ Roll No : 1602-19-733- Page No: \_\_\_\_\_

## Lab Experiment

### Introducing Amazon Elastic File System (Amazon EFS)

#### Accessing the AWS Management Console

1. At the top of these instructions, choose **Start Lab** to launch your lab.

A **Start Lab** panel opens, and it displays the lab status.

**Tip:** If you need more time to complete the lab, restart the timer for the environment by choosing the **Start Lab** button again.

2. Wait until the **Start Lab** panel displays the message *Lab status: ready*, then close the panel by choosing the **X**.
3. At the top of these instructions, choose **AWS**.
4. Arrange the **AWS Management Console** tab so that it displays alongside these instructions. Ideally, you will have both browser tabs open at the same time so that you can follow the lab steps more easily.

#### Task 1: Creating a security group to access your EFS file system

5. In the **AWS Management Console**, on the **Services** menu, choose **EC2**.
6. In the navigation pane on the left, choose **Security Groups**.
7. Copy the **Security group ID** of the *EFSCliant* security group to your text editor.

The Group ID should look similar to *sg-03727965651b6659b*.

8. Choose **Create security group** then configure:
  - **Security group name:** *EFS Mount Target*
  - **Description:** *Inbound NFS access from EFS clients*
  - **VPC:** *Lab VPC*
9. Under the **Inbound rules** section, choose **Add rule** then configure:
  - **Type:** *NFS*
  - **Source:**
    - *Custom*
    - In the *Custom* box, paste the security group's **Security group ID** that you copied to your text editor
  - Choose **Create security group**.

#### Task 2: Creating an EFS file system

10. On the **Services** menu, choose **EFS**.
11. Choose **Create file system**
12. In the **Create file system** window, choose **Customize**

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## 13. On **Step 1**:

- Uncheck Enable automatic backups.
- **Lifecycle management**: Select *None*
- In the **Tags** section, configure:
  - **Key**: Name
  - **Value**: My First EFS File System

## 14. Choose Next

## 15. For **VPC**, select *Lab VPC*.

## 16. Detach the default security group from each *Availability Zone* mount target by choosing the check box on each default security group.

## 17. Attach the **EFS Mount Target** security group to each *Availability Zone* mount target by:

- Selecting each **Security groups** check box.
- Choosing **EFS Mount Target**

A mount target is created for each subnet

## 18. Choose Next

## 19. On **Step 3**, choose Next

## 20. On **Step 4**:

- Review your configuration.
- Choose **Create**

Proceed to the next step after the **Mount target state** for each mount target changes to *Available*. Choose the screen refresh button after 2–3 minutes to check its progress.

## Task 3: Connecting to your EC2 instance via SSH

In this task, you will connect to your EC2 instance by using Secure Shell (SSH).

21. Above these instructions that you are currently reading, choose the **Details** dropdown menu, and then select **Show**

A **Credentials** window opens.

22. Choose the **Download PPK** button and save the **labsuser.ppk** file.

**Note:** Typically, your browser saves the file to the **Downloads** directory.

23. Note the **EC2PublicIP** address if it is displayed.

24. Exit the **Details** panel by choosing the **X**.

25. To use SSH to access the EC2 instance, you must use **\*PuTTY\***. If you do not have PuTTY installed on your computer, [download PuTTY](#).

26. Open **putty.exe**.

27. To keep the PuTTY session open for a longer period of time, configure the PuTTY timeout:

- Choose **Connection**
- **Seconds between keepalives**: 30

28. Configure your PuTTY session by using the following settings.

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- Choose **Session**
- **Host Name (or IP address):** Paste the **EC2PublicIP** for the instance you noted earlier
  - Alternatively, return to the Amazon EC2 console and choose **Instances**
  - Select the instance you want to connect to
  - In the *Description* tab, copy the **IPv4 Public IP** value
- Back in PuTTY, in the **Connection** list, expand **SSH**
- Choose **Auth** (but don't expand it)
- Choose **Browse**
- Browse to the *labsuser.ppk* file that you downloaded, select it, and choose **Open**
- Choose **Open** again

29. To trust and connect to the host, choose **Yes**.

30. When you are prompted with **login as**, enter: `ec2-user`.

This action connects you to the EC2 instance.

## Task 4: Creating a new directory and mounting the EFS file system

31. In your SSH session, make a new directory by entering `sudo mkdir efs`
32. Back in the **AWS Management Console**, on the **Services** menu, choose **EFS**.
33. Choose **My First EFS File System**.
34. In the **Amazon EFS Console**, on the top right corner of the page, choose **Attach** to open the Amazon EC2 mount instructions.
35. Copy the entire command in the **Using the NFS client** section.

The mount command should look similar to this example:

```
sudo mount -t nfs4 -o nfsvers=4.1,rsize=1048576,wsiz=1048576,hard,timeo=600,retrans=2,noresvport fs-bce57914.efs.us-west-2.amazonaws.com:/ efs
```

The provided `sudo mount...` command uses the default Linux mount options.

36. In your Linux SSH session, mount your Amazon EFS file system by:
  - Pasting the command
  - Pressing ENTER
37. Get a full summary of the available and used disk space usage by entering:

```
sudo df -hT
```

## Task 5: Examining the performance behavior of your new EFS file system

38. Examine the write performance characteristics of your file system by entering:

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```
sudo fio --name=fio-efs --filesize=10G --filename=./efs/fio-efs-test.img --bs=1M --nrfiles=1 --direct=1 -  
-sync=0 --rw=write --iodepth=200 --ioengine=libaio
```

Monitoring performance by using Amazon CloudWatch

39. In the **AWS Management Console**, on the Services menu, choose **CloudWatch**.
40. In the navigation pane on the left, choose **Metrics**.
41. In the **All-metrics** tab, choose **EFS**.
42. Choose **File System Metrics**.
43. Select the row that has the **PermittedThroughput** Metric Name.

You might need to wait 2–3 minutes and refresh the screen several times before all available metrics, including **PermittedThroughput**, calculate and populate.

44. On the graph, choose and drag around the data line. If you do not see the line graph, adjust the time range of the graph to display the period during which you ran the `fio` command.
45. Pause your pointer on the data line in the graph. The value should be *105M*.
46. In the **All-metrics** tab, *uncheck* the box for **PermittedThroughput**.
47. Select the check box for **DataWriteIOBytes**.

If you do not see *DataWriteIOBytes* in the list of metrics, use the **File System Metrics** search to find it.

48. Choose the **Graphed metrics** tab.
49. On the **Statistics** column, select **Sum**.
50. On the **Period** column, select **1 Minute**.
51. Pause your pointer on the peak of the line graph. Take this number (in bytes) and divide it by the duration in seconds (60 seconds). The result gives you the write throughput (B/s) of your file system during your test.

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## OUTPUT SCREENSHOTS:

### Task-1: Creating a security group to access your EFS file system

The screenshot shows the 'Basic details' section of the AWS IAM console. The 'Security group name' is 'EFS Mount Target'. The 'Description' is 'Inbound NFS access from EFS clients'. The 'VPC' is 'vpc-0e151368530c2dcc7'. The 'Inbound rules' section shows a rule for 'NFS' protocol, 'TCP' port range '2049', and 'Custom' source. The rule is associated with the security group 'sg-0ab07af222dc18773'.

Type	Protocol	Port range	Source	Description - optional
NFS	TCP	2049	Custom	

### Task-2: Creating an EFS file system

The screenshot shows the 'Mount targets' section of the AWS IAM console. It displays two mount targets for the EFS file system. The first mount target is in the 'us-east-1a' availability zone, with subnet 'subnet-0099cdaaeac24424e' and IP address 'Automatic'. The second mount target is in the 'us-east-1b' availability zone, with subnet 'subnet-0ed63276a5874d404' and IP address 'Automatic'. Both mount targets are associated with the security group 'sg-00f8ba5a438a7469'.

Availability zone	Subnet ID	IP address	Security groups
us-east-1a	subnet-0099cdaaeac24424e	Automatic	sg-00f8ba5a438a7469
us-east-1b	subnet-0ed63276a5874d404	Automatic	sg-00f8ba5a438a7469

Mount targets			
Availability zone	Subnet	IP address	Security groups
us-east-1a	subnet-0099cdaaeac24424e	-	sg-00f8ba5a438a74694
us-east-1b	subnet-0ed63276a5874d404	-	sg-00f8ba5a438a74694

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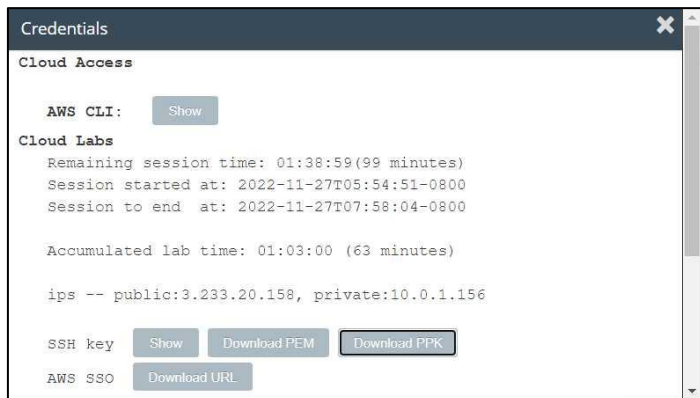
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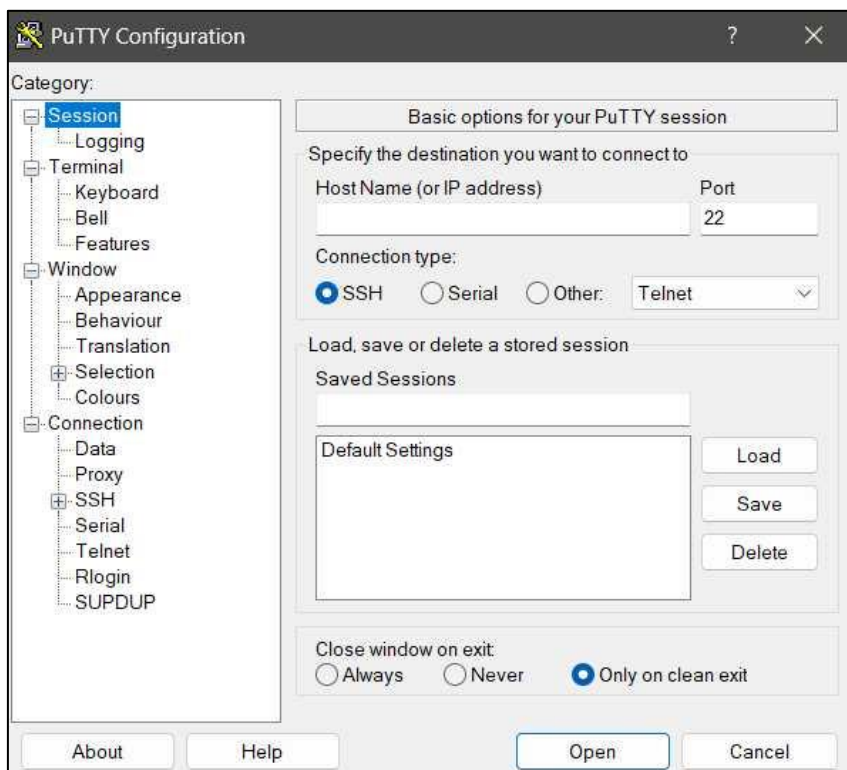
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## Task-3:

### Credentials Tab



### Putty Config



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```
ec2-user@ip-10-0-1-156:~  
login as: ec2-user  
Authenticating with public key "imported-openssh-key"  
  
  _ | _ | _ )  
  _ | ( _ | _ /  Amazon Linux 2 AMI  
  _ | \ _ | _ |  
  
https://aws.amazon.com/amazon-linux-2/  
[ec2-user@ip-10-0-1-156 ~]$
```

## Task-5: Examining the performance behavior of your new EFS file system

