

Lab 4: Working with EBS

COS20019

Cloud Computing Architecture

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Task 1: Create new EBS volume

1. Setting up the new EBS

The screenshot shows the AWS Management Console interface for creating a new EBS volume. The top navigation bar includes the AWS logo, 'Services', a search bar, and the user's account information (N. Virginia, voclabs/user2553680=Tran_Thanh_Minh @ 8869-8661-5515).

The main content area is titled 'Create EBS Volume' and includes the following sections:

- Size:** 100 / 3000. Baseline of 3 IOPS per GiB with a minimum of 100 IOPS, burstable to 3000 IOPS.
- Throughput (MiB/s):** Not applicable.
- Availability Zone:** us-east-1a.
- Snapshot ID - optional:** Don't create volume from a snapshot.
- Encryption:** Use Amazon EBS encryption as an encryption solution for your EBS resources associated with your EC2 instances. ☐ Encrypt this volume.
- Tags - optional:** A tag is a label that you assign to an AWS resource. Each tag consists of a key and an optional value. You can use tags to search and filter your resources or track your AWS costs.

The 'Tags' section shows a table with two columns: 'Key' and 'Value - optional'. The 'Key' column has a search bar with 'Name' and a close button. The 'Value' column has a search bar with 'My Volume' and a close button. Below the search bars, there is a button 'Add tag' and a note 'You can add 49 more tags.'.

Task 2: Attach the volume to an instance

1. Attach the volume to an instance lab which is already created by default

Attach volume [Info](#)

Attach a volume to an instance to use it as you would a regular physical hard disk drive.

Basic details

Volume ID
vol-08c2003b70008b1d5 (My Volume)

Availability Zone
us-east-1a

Instance [Info](#)
i-0482b7b1fbb2f8b19

Only instances in the same Availability Zone as the selected volume are displayed.

Device name [Info](#)
/dev/sdf

Recommended device names for Linux: /dev/sda1 for root volume. /dev/sd[f-p] for data volumes.

Info Newer Linux kernels may rename your devices to /dev/xvdf through /dev/xvdp internally, even when the device name entered here (and shown in the details) is /dev/sdf through /dev/sdp.

[Cancel](#) [Attach volume](#)

Task 3: Connect to Amazon EC2 instance

1. Connect to instance lab

Instances (1/2) [Info](#)

[Find instance by attribute or tag \(case-sensitive\)](#)

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS
Bastion Host	i-0e30ddb4e467ead1c	Running	t2.micro	2/2 checks passed	No alarms	us-east-1a	ec2-34-203-191-
		Running	t2.micro	2/2 checks passed	No alarms	us-east-1a	ec2-44-211-174-

PuTTY Configuration

Category: Session

Basic options for your PuTTY session

Specify the destination you want to connect to

Host Name (or IP address) 44.211.174.192 Port 22

Connection type: ☒ SSH ☐ Serial ☐ Other: Telnet

Load, save or delete a stored session

Saved Sessions

Default Settings Cloud AWS default mercury.swin.edu.au

Close window on exit: ☐ Always ☐ Never ☒ Only on clean exit

[Open](#) [Cancel](#)

IP name: ip-10-1-11-131.ec2.internal

Answer private resource DNS name

Auto-assigned IP address

Instance details

Public IPv4 address: 44.211.174.192 [open address](#)

Private IPv4 addresses: 10.1.11.131

Public IPv4 DNS: ec2-44-211-174-192.compute-1.amazonaws.com [open address](#)

Private IP DNS name (IPv4 only): ip-10-1-11-131.ec2.internal

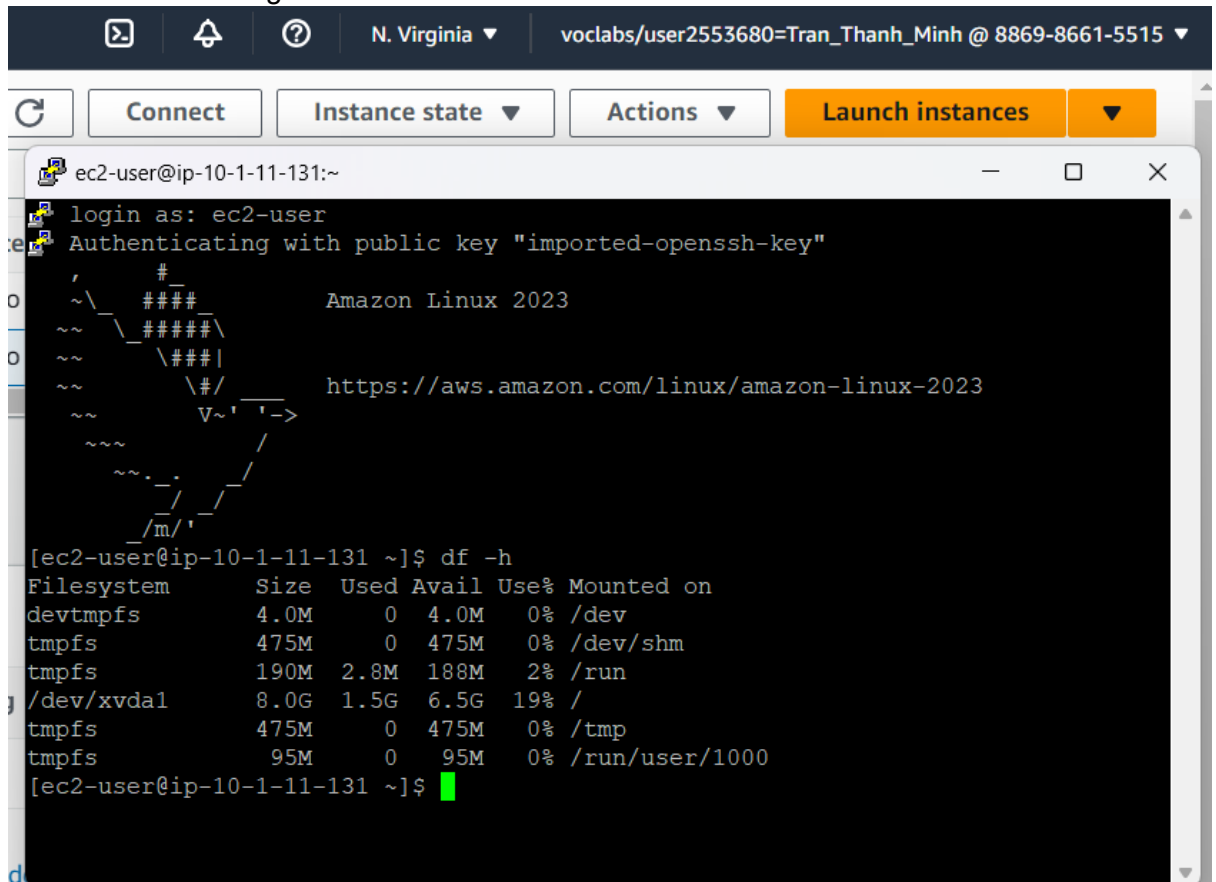
Instance type: t2.micro

VPC ID

AWS Compute Optimizer finding

Task 4: Create and configure your file system

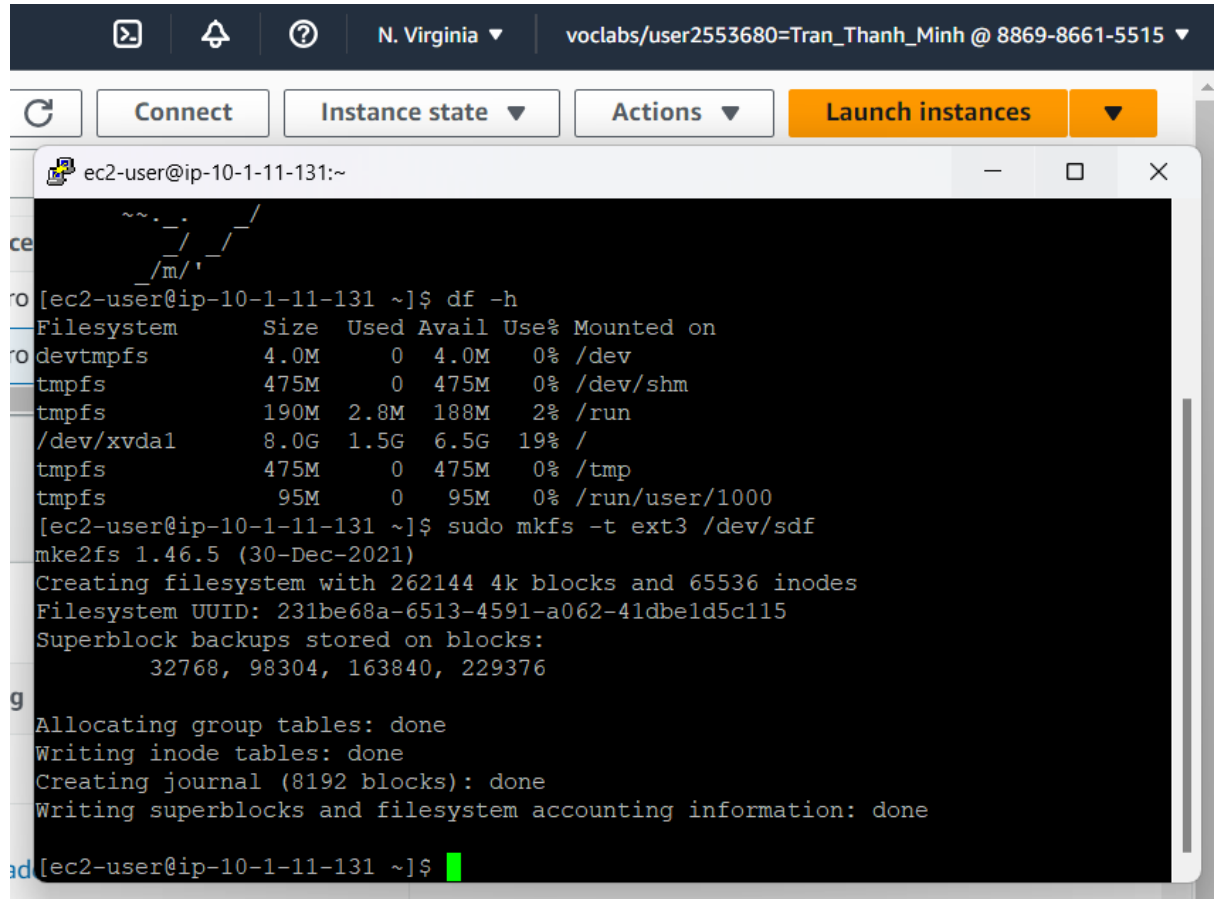
1. To view all the storage available on the instance



The screenshot shows a terminal window within the AWS Management Console. The terminal is connected to an EC2 instance named 'ec2-user@ip-10-1-11-131:~'. The user has logged in as 'ec2-user' and authenticated with a public key. The terminal displays the Amazon Linux 2023 logo and a URL: <https://aws.amazon.com/linux/amazon-linux-2023>. The user has executed the command 'df -h' to view disk space usage. The output is as follows:

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

2. Create an ext3 file on the new volume

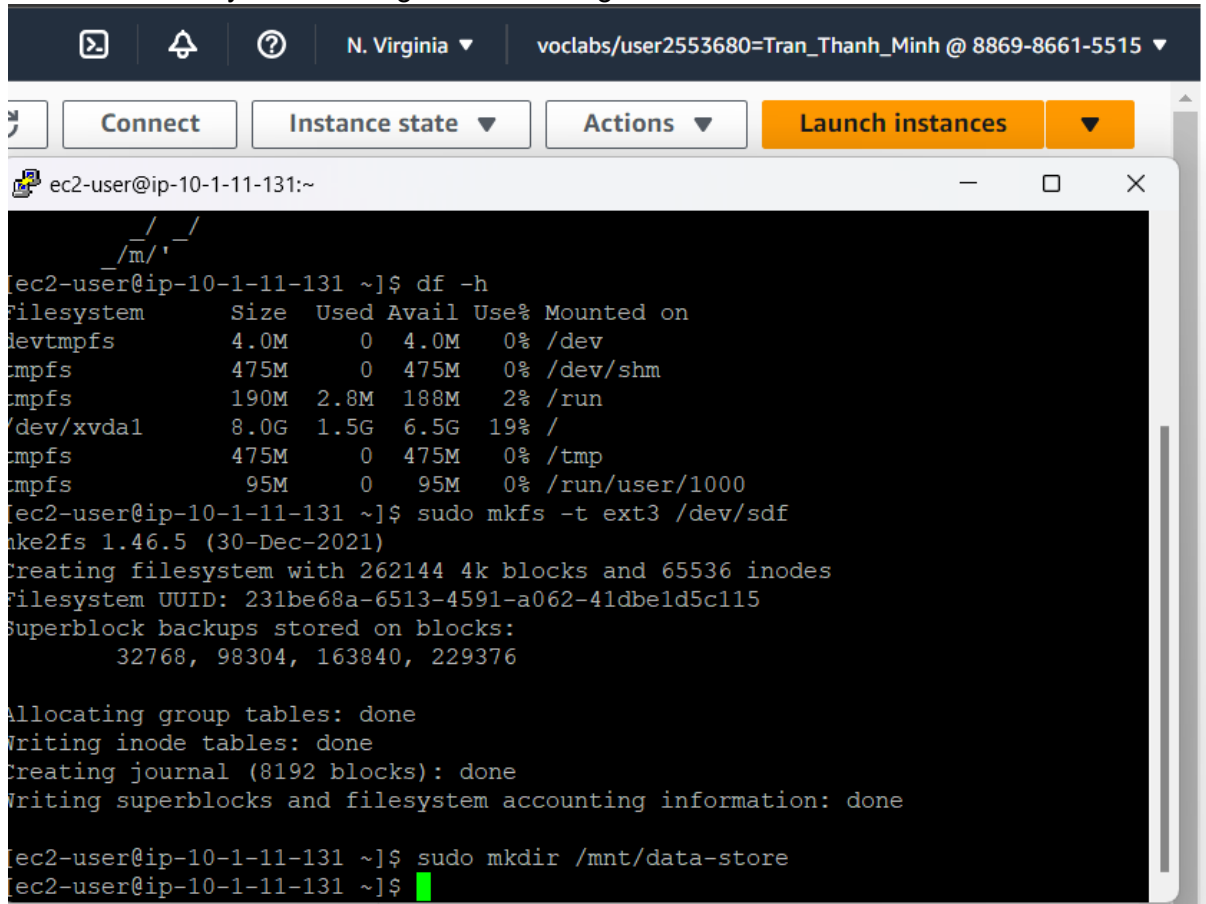


The screenshot shows the AWS Management Console interface at the top, with a navigation bar indicating the region is 'N. Virginia' and the user is 'voclabs/user2553680=Tran_Thanh_Minh @ 8869-8661-5515'. Below the navigation bar, there are buttons for 'Connect', 'Instance state', 'Actions', and 'Launch instances'. The main content area displays a terminal window for an EC2 instance with the IP address 'ip-10-1-11-131'. The terminal shows the following commands and output:

```
ec2-user@ip-10-1-11-131:~$ 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
[ec2-user@ip-10-1-11-131 ~]$ sudo mkfs -t ext3 /dev/sdf
mkfs2fs 1.46.5 (30-Dec-2021)
Creating filesystem with 262144 4k blocks and 65536 inodes
Filesystem UUID: 231be68a-6513-4591-a062-41dbe1d5c115
Superblock backups stored on blocks:
    32768, 98304, 163840, 229376

Allocating group tables: done
Writing inode tables: done
Creating journal (8192 blocks): done
Writing superblocks and filesystem accounting information: done
[ec2-user@ip-10-1-11-131 ~]$
```

3. Create a directory for mounting the new storage volume



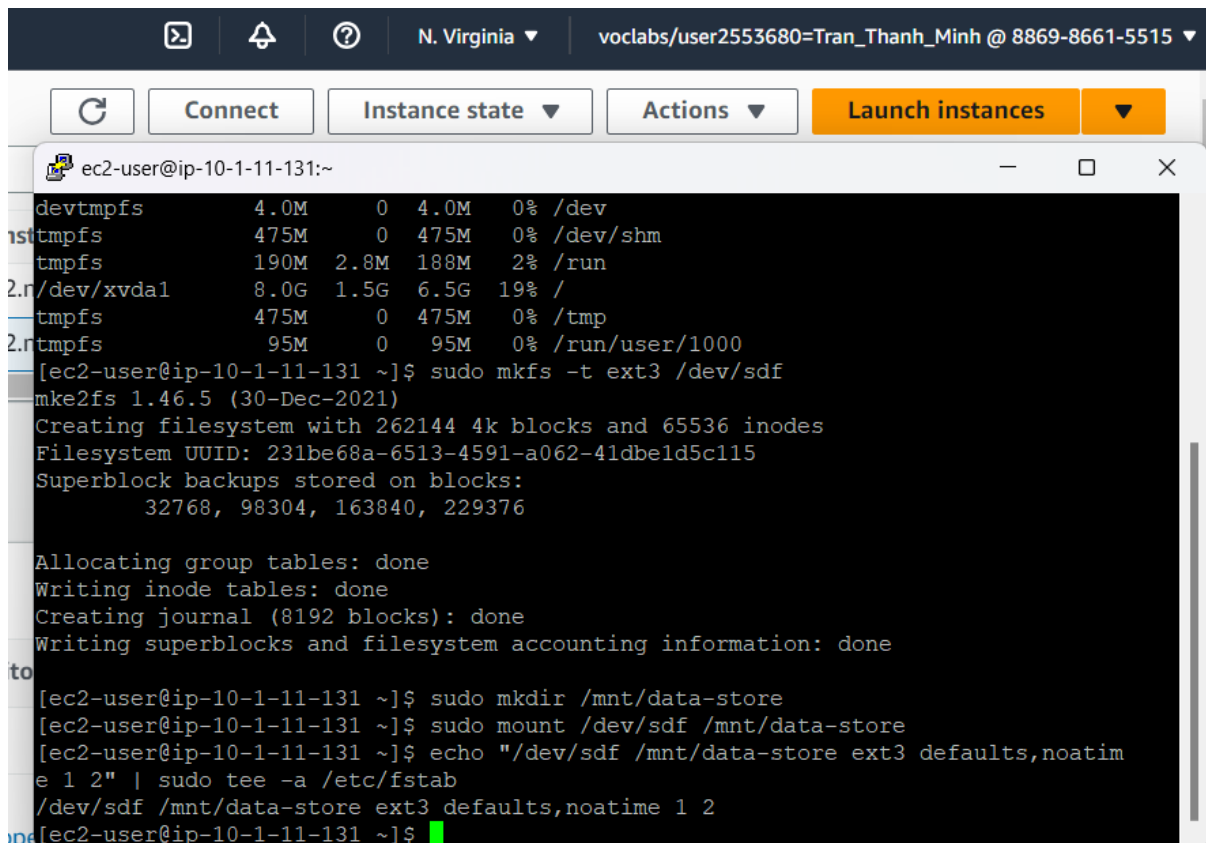
The screenshot shows the AWS Management Console interface with a terminal window open for an EC2 instance. The terminal displays the output of the `df -h` command, showing disk usage for various filesystems. Then, the `mkfs -t ext3 /dev/sdf` command is executed, creating an ext3 filesystem on the new volume. Finally, the `mkdir /mnt/data-store` command is run to create a directory for mounting the volume.

```
ec2-user@ip-10-1-11-131:~$ 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
ec2-user@ip-10-1-11-131 ~]$ sudo mkfs -t ext3 /dev/sdf
mke2fs 1.46.5 (30-Dec-2021)
Creating filesystem with 262144 4k blocks and 65536 inodes
Filesystem UUID: 231be68a-6513-4591-a062-41dbeld5c115
Superblock backups stored on blocks:
    32768, 98304, 163840, 229376

Allocating group tables: done
Writing inode tables: done
Creating journal (8192 blocks): done
Writing superblocks and filesystem accounting information: done

ec2-user@ip-10-1-11-131 ~]$ sudo mkdir /mnt/data-store
ec2-user@ip-10-1-11-131 ~]$
```

4. Mount the new volume



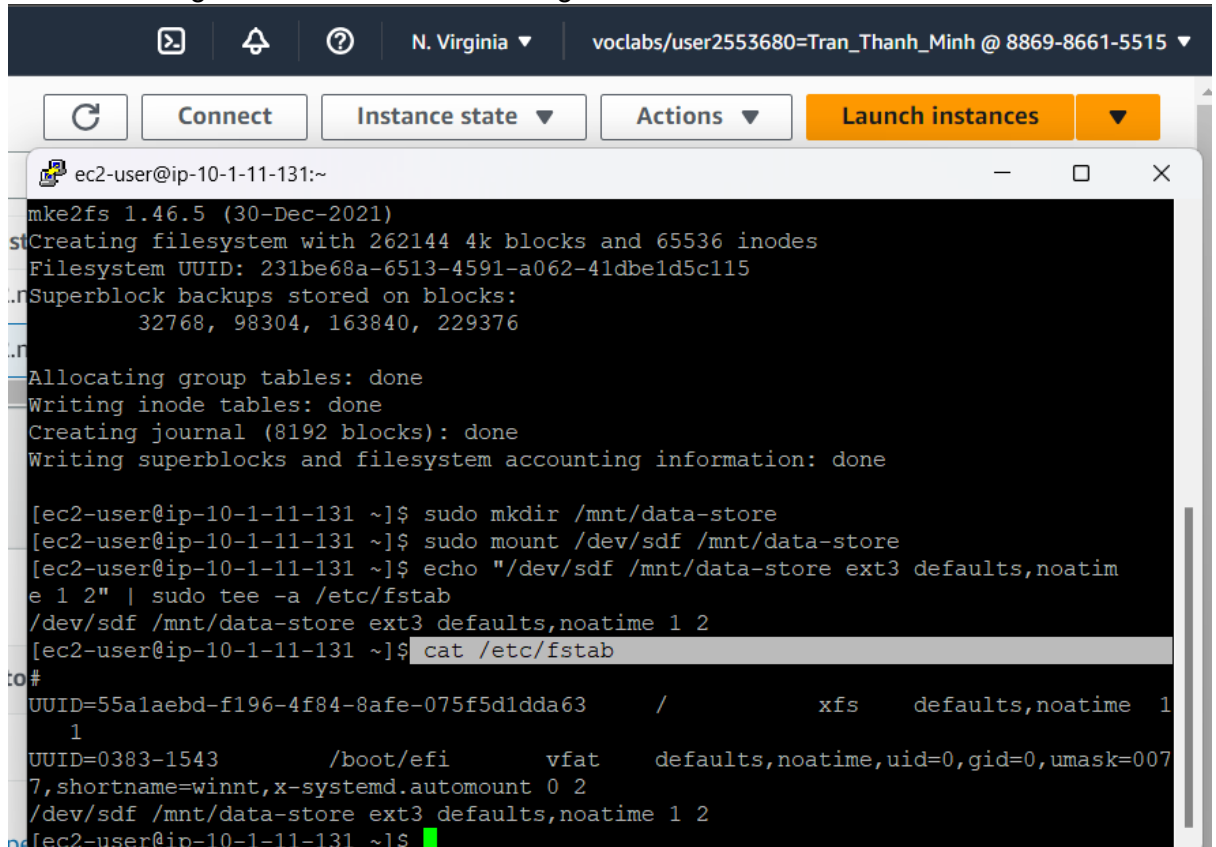
The screenshot shows the AWS Management Console interface with a terminal window open for an EC2 instance. The terminal displays the output of the `df -h` command, showing disk usage for various filesystems. Then, the `mkfs -t ext3 /dev/sdf` command is executed, creating an ext3 filesystem on the new volume. Finally, the `mkdir /mnt/data-store` command is run to create a directory for mounting the volume.

```
ec2-user@ip-10-1-11-131:~$ 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
ec2-user@ip-10-1-11-131 ~]$ sudo mkfs -t ext3 /dev/sdf
mke2fs 1.46.5 (30-Dec-2021)
Creating filesystem with 262144 4k blocks and 65536 inodes
Filesystem UUID: 231be68a-6513-4591-a062-41dbeld5c115
Superblock backups stored on blocks:
    32768, 98304, 163840, 229376

Allocating group tables: done
Writing inode tables: done
Creating journal (8192 blocks): done
Writing superblocks and filesystem accounting information: done

ec2-user@ip-10-1-11-131 ~]$ sudo mkdir /mnt/data-store
ec2-user@ip-10-1-11-131 ~]$ sudo mount /dev/sdf /mnt/data-store
ec2-user@ip-10-1-11-131 ~]$ echo "/dev/sdf /mnt/data-store ext3 defaults,noatim
e 1 2" | sudo tee -a /etc/fstab
/dev/sdf /mnt/data-store ext3 defaults,noatime 1 2
ec2-user@ip-10-1-11-131 ~]$
```

5. View the configuration file to see the setting on the last line



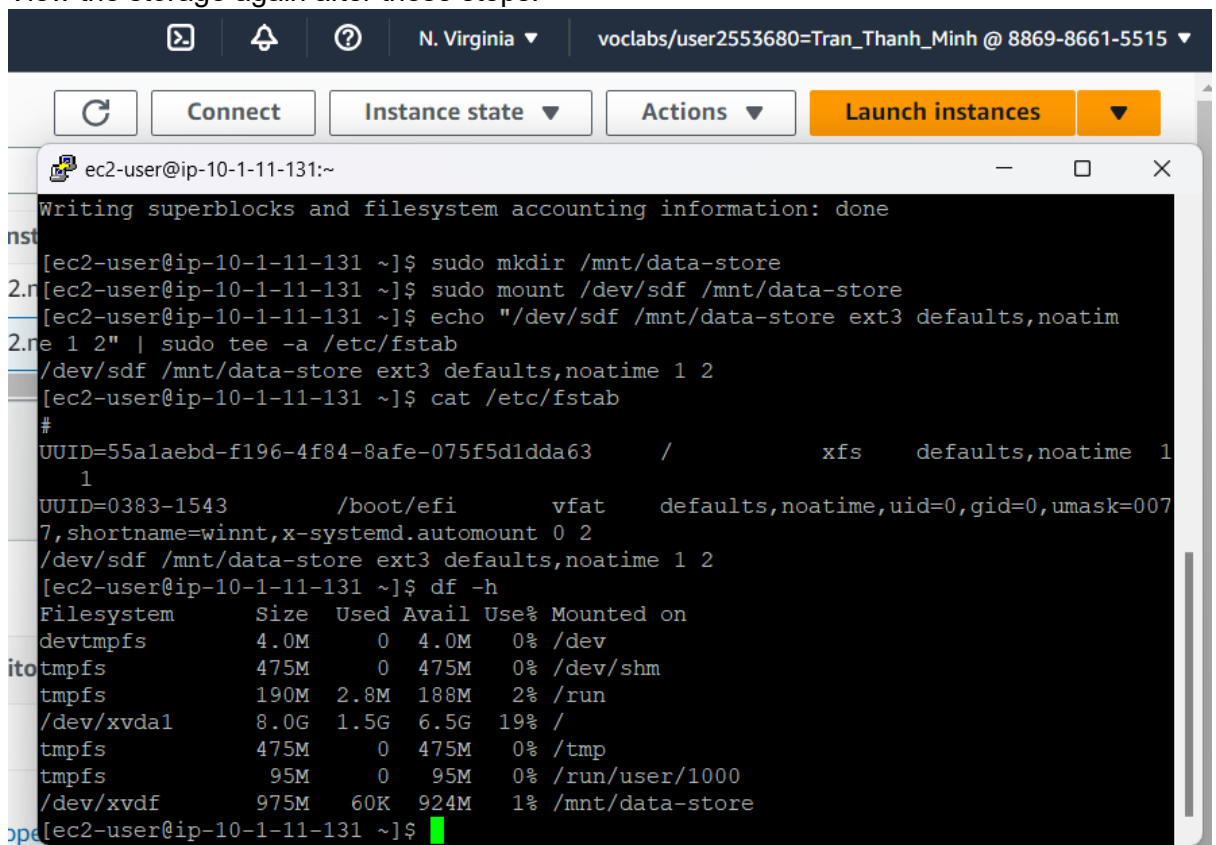
The screenshot shows the AWS Management Console interface for an EC2 instance. The top bar indicates the region is 'N. Virginia' and the user is 'voclabs/user2553680=Tran_Thanh_Minh @ 8869-8661-5515'. Below the navigation bar, there are buttons for 'Connect', 'Instance state', 'Actions', and 'Launch instances'. The main content area displays a terminal window for the instance 'ec2-user@ip-10-1-11-131:~'. The terminal output shows the following commands and their results:

```
mke2fs 1.46.5 (30-Dec-2021)
Creating filesystem with 262144 4k blocks and 65536 inodes
Filesystem UUID: 231be68a-6513-4591-a062-41dbeld5c115
Superblock backups stored on blocks:
    32768, 98304, 163840, 229376

Allocating group tables: done
Writing inode tables: done
Creating journal (8192 blocks): done
Writing superblocks and filesystem accounting information: done

[ec2-user@ip-10-1-11-131 ~]$ sudo mkdir /mnt/data-store
[ec2-user@ip-10-1-11-131 ~]$ sudo mount /dev/sdf /mnt/data-store
[ec2-user@ip-10-1-11-131 ~]$ echo "/dev/sdf /mnt/data-store ext3 defaults,noatim
e 1 2" | sudo tee -a /etc/fstab
/dev/sdf /mnt/data-store ext3 defaults,noatime 1 2
[ec2-user@ip-10-1-11-131 ~]$ cat /etc/fstab
#
UUID=55a1aebd-f196-4f84-8afe-075f5d1dda63 / xfs defaults,noatime 1
1
UUID=0383-1543 /boot/efi vfat defaults,noatime,uid=0,gid=0,umask=007
7,shortname=winnt,x-systemd.automount 0 2
/dev/sdf /mnt/data-store ext3 defaults,noatime 1 2
[ec2-user@ip-10-1-11-131 ~]$
```

6. View the storage again after these steps:

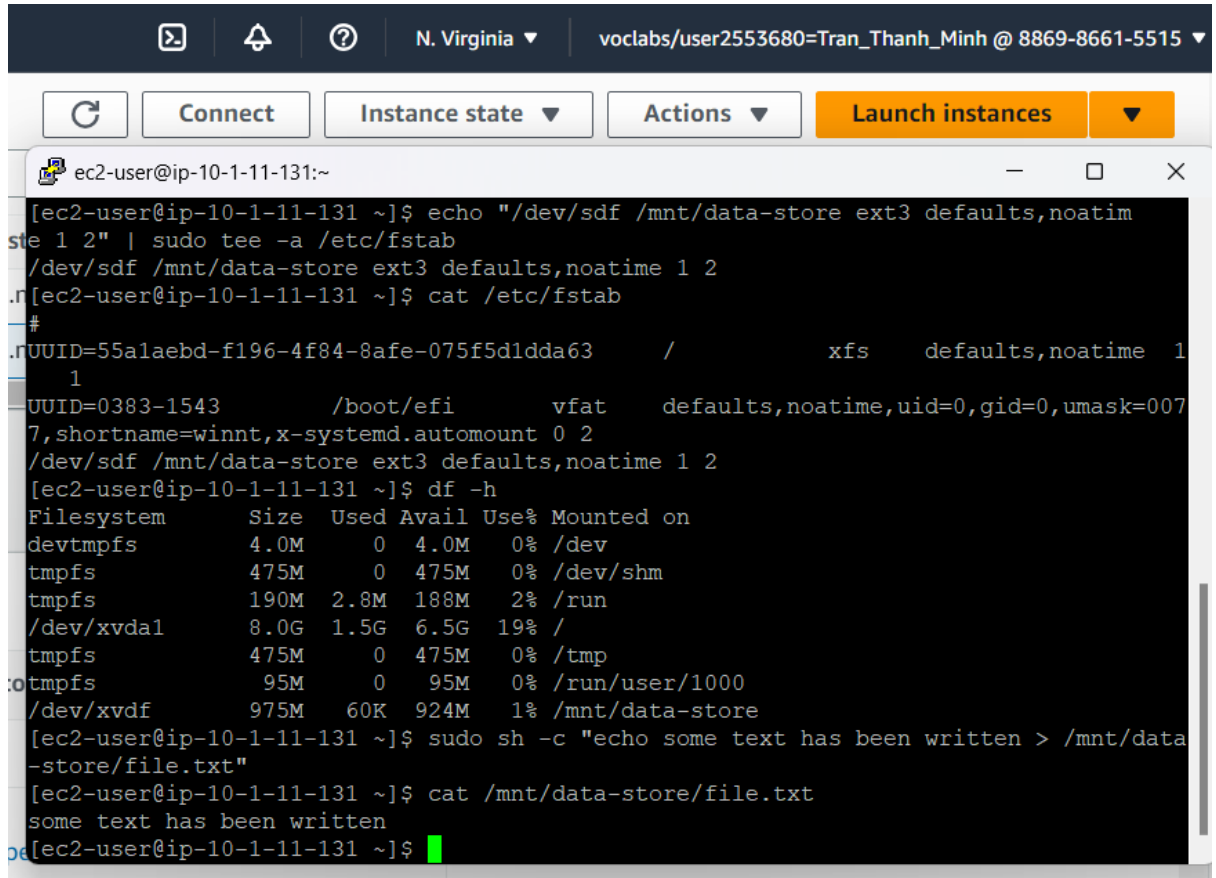


The screenshot shows the AWS Management Console interface for an EC2 instance. The top bar indicates the region is 'N. Virginia' and the user is 'voclabs/user2553680=Tran_Thanh_Minh @ 8869-8661-5515'. Below the navigation bar, there are buttons for 'Connect', 'Instance state', 'Actions', and 'Launch instances'. The main content area displays a terminal window for the instance 'ec2-user@ip-10-1-11-131:~'. The terminal output shows the following commands and their results:

```
Writing superblocks and filesystem accounting information: done

[ec2-user@ip-10-1-11-131 ~]$ sudo mkdir /mnt/data-store
[ec2-user@ip-10-1-11-131 ~]$ sudo mount /dev/sdf /mnt/data-store
[ec2-user@ip-10-1-11-131 ~]$ echo "/dev/sdf /mnt/data-store ext3 defaults,noatim
e 1 2" | sudo tee -a /etc/fstab
/dev/sdf /mnt/data-store ext3 defaults,noatime 1 2
[ec2-user@ip-10-1-11-131 ~]$ cat /etc/fstab
#
UUID=55a1aebd-f196-4f84-8afe-075f5d1dda63 / xfs defaults,noatime 1
1
UUID=0383-1543 /boot/efi vfat defaults,noatime,uid=0,gid=0,umask=007
7,shortname=winnt,x-systemd.automount 0 2
/dev/sdf /mnt/data-store ext3 defaults,noatime 1 2
[ec2-user@ip-10-1-11-131 ~]$ 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
/dev/xvdf       975M   60K   924M   1% /mnt/data-store
[ec2-user@ip-10-1-11-131 ~]$
```

7. Create a file on the mounted volume and check the text has been written or not

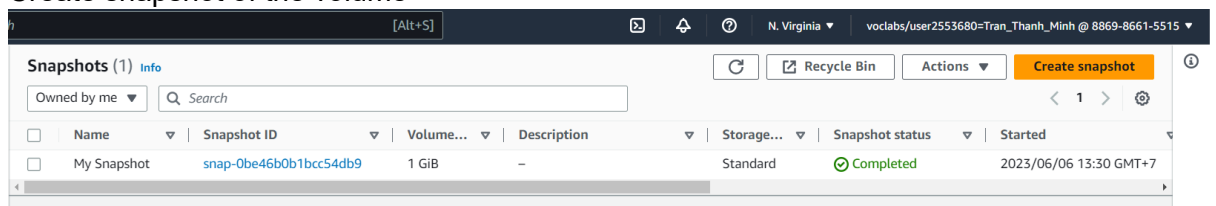


The screenshot shows the AWS Management Console interface for an EC2 instance. At the top, there's a header with the region 'N. Virginia' and the user 'voclabs/user2553680=Tran_Thanh_Minh @ 8869-8661-5515'. Below the header, there are buttons for 'Connect', 'Instance state', 'Actions', and 'Launch instances'. The main content area shows a terminal window for the instance 'ec2-user@ip-10-1-11-131:~'. The terminal output shows the following commands and results:

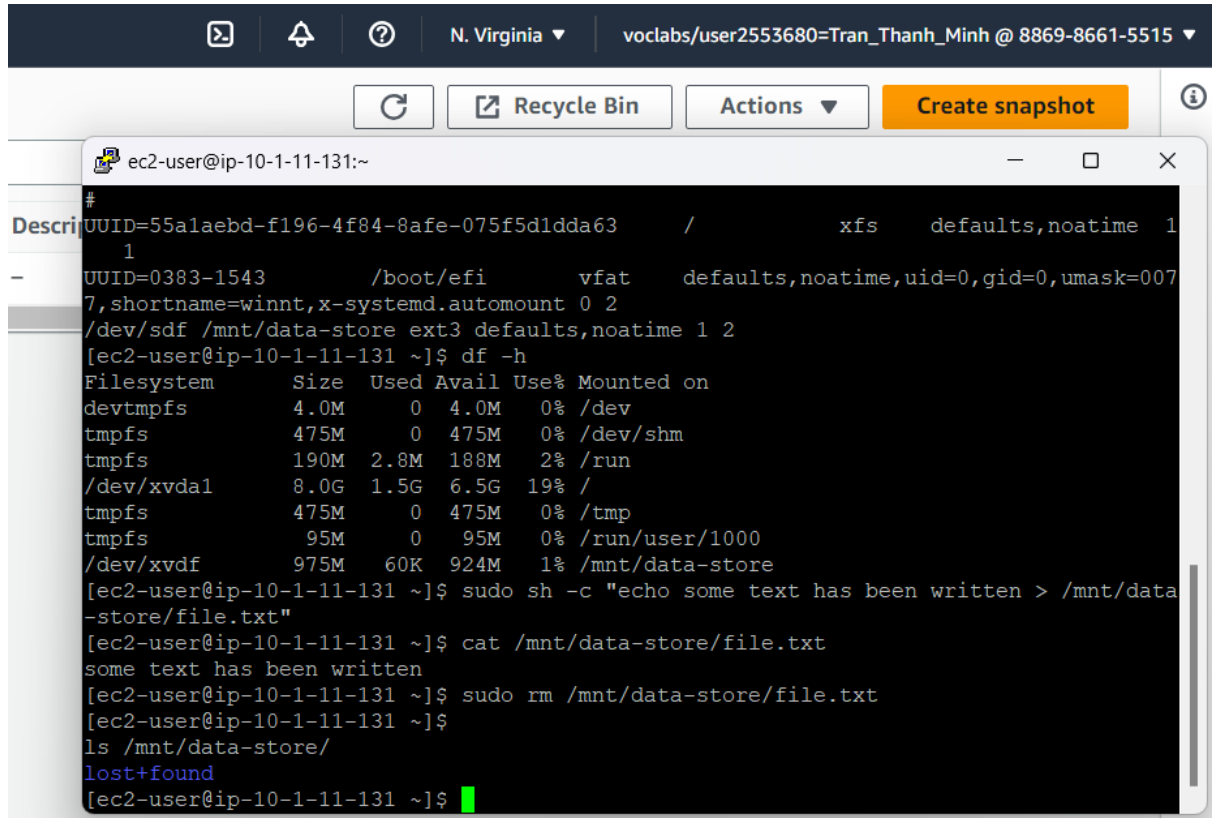
```
[ec2-user@ip-10-1-11-131 ~]$ echo "/dev/sdf /mnt/data-store ext3 defaults,noatime 1 2" | sudo tee -a /etc/fstab
/dev/sdf /mnt/data-store ext3 defaults,noatime 1 2
[ec2-user@ip-10-1-11-131 ~]$ cat /etc/fstab
#
UUID=55a1aebd-f196-4f84-8afe-075f5d1dda63 / xfs defaults,noatime 1
1
UUID=0383-1543 /boot/efi vfat defaults,noatime,uid=0,gid=0,umask=007
7,shortname=winnt,x-systemd.automount 0 2
/dev/sdf /mnt/data-store ext3 defaults,noatime 1 2
[ec2-user@ip-10-1-11-131 ~]$ 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
/dev/xvdf       975M  60K  924M  1% /mnt/data-store
[ec2-user@ip-10-1-11-131 ~]$ sudo sh -c "echo some text has been written > /mnt/data-store/file.txt"
[ec2-user@ip-10-1-11-131 ~]$ cat /mnt/data-store/file.txt
some text has been written
[ec2-user@ip-10-1-11-131 ~]$
```

Task 5: Create an Amazon EBS snapshot

1. Create snapshot of the volume



2. Delete the file and see the file has been deleted

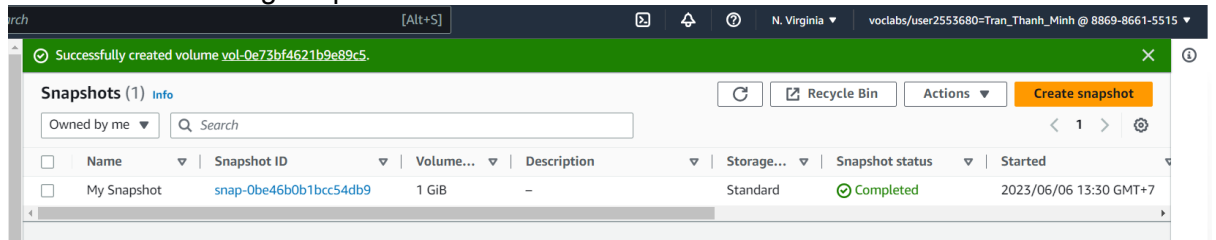


The screenshot shows a terminal window on an EC2 instance with IP 10-1-11-131. The user runs several commands to check disk space, create a file, and then delete it. The file is successfully deleted, as confirmed by the 'ls' command output.

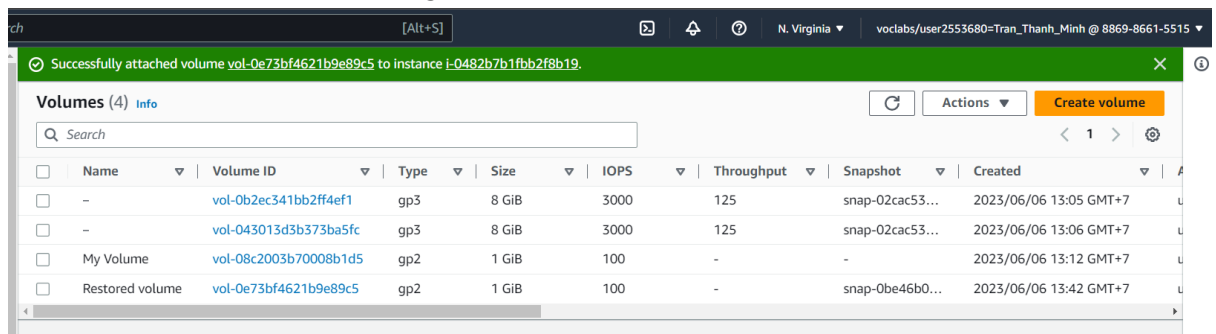
```
#
Description: UUID=55a1aebd-f196-4f84-8afe-075f5d1dda63 / xfs defaults,noatime 1
1
UUID=0383-1543 /boot/efi vfat defaults,noatime,uid=0,gid=0,umask=007
7,shortname=winnt,x-systemd.automount 0 2
/dev/sdf /mnt/data-store ext3 defaults,noatime 1 2
[ec2-user@ip-10-1-11-131 ~]$ df -h
Filesystem      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
/dev/xvdf       975M  60K  924M  1% /mnt/data-store
[ec2-user@ip-10-1-11-131 ~]$ sudo sh -c "echo some text has been written > /mnt/data-store/file.txt"
[ec2-user@ip-10-1-11-131 ~]$ cat /mnt/data-store/file.txt
some text has been written
[ec2-user@ip-10-1-11-131 ~]$ sudo rm /mnt/data-store/file.txt
[ec2-user@ip-10-1-11-131 ~]$
ls /mnt/data-store/
lost+found
[ec2-user@ip-10-1-11-131 ~]$
```

Task 6: Restore the Amazon EBS snapshot

1. Create volume using snapshot



2. Attach the restored volume to EC2 instance



3. Mount the restored volume, then create the directory for mounting the new storage volume and mount it then check if the volume has the file I have created earlier

```
ec2-user@ip-10-1-11-131:~$ 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
/dev/xvdf        975M  60K  924M   1% /mnt/data-store
[ec2-user@ip-10-1-11-131 ~]$ sudo sh -c "echo some text has been written > /mnt/data-store/file.txt"
[ec2-user@ip-10-1-11-131 ~]$ cat /mnt/data-store/file.txt
some text has been written
[ec2-user@ip-10-1-11-131 ~]$ sudo rm /mnt/data-store/file.txt
[ec2-user@ip-10-1-11-131 ~]$
ls /mnt/data-store/
lost+found
[ec2-user@ip-10-1-11-131 ~]$ sudo mkdir /mnt/data-store2
[ec2-user@ip-10-1-11-131 ~]$ sudo mount /dev/sdg /mnt/data-store2
[ec2-user@ip-10-1-11-131 ~]$ ls /mnt/data-store2/
file.txt  lost+found
[ec2-user@ip-10-1-11-131 ~]$
```

4. The data has been restored

```
ec2-user@ip-10-1-11-131:~$ 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
/dev/xvdf        975M  60K  924M   1% /mnt/data-store
[ec2-user@ip-10-1-11-131 ~]$ sudo sh -c "echo some text has been written > /mnt/data-store/file.txt"
[ec2-user@ip-10-1-11-131 ~]$ cat /mnt/data-store/file.txt
some text has been written
[ec2-user@ip-10-1-11-131 ~]$ sudo rm /mnt/data-store/file.txt
[ec2-user@ip-10-1-11-131 ~]$
ls /mnt/data-store/
lost+found
[ec2-user@ip-10-1-11-131 ~]$ sudo mkdir /mnt/data-store2
[ec2-user@ip-10-1-11-131 ~]$ sudo mount /dev/sdg /mnt/data-store2
[ec2-user@ip-10-1-11-131 ~]$ ls /mnt/data-store2/
file.txt  lost+found
[ec2-user@ip-10-1-11-131 ~]$ cat ./
./          .bash_logout  .bashrc
../         .bash_profile .ssh/
[ec2-user@ip-10-1-11-131 ~]$ cat ./
./          .bash_logout  .bashrc
../         .bash_profile .ssh/
[ec2-user@ip-10-1-11-131 ~]$ cat /mnt/data-store2/file.txt
some text has been written
[ec2-user@ip-10-1-11-131 ~]$
```