

Exercises Creating and Mounting Filesystems

Exercise 1: Create and Inspect a Filesystem on /dev/sda1

1. Confirm the partition exists:

```
sudo fdisk -l
```

2. Make sure /dev/sda1 is **not mounted** before formatting:

```
mount | grep sda1
```

3. Create an **EXT4 filesystem**:

```
sudo mkfs /dev/sda1
```

4. Label the filesystem:

```
sudo e2label /dev/sda1 data_part
```

5. Verify it using either:

```
sudo blkid /dev/sda1
```

or

```
sudo file -s /dev/sda1
```

What is the difference between using `blkid` and `file -s` to identify filesystem types?

Exercise 2: Mount and Verify

Goal: Mount the formatted partition and inspect usage details.

1. Create a mount point:

```
sudo mkdir /mnt/data
```

2. Mount the partition:

```
sudo mount /dev/sda1 /mnt/data
```

3. Verify the mount:

```
df -h /mnt/data  
mount | grep sda1
```

4. Create a sample file:

```
sudo touch /mnt/data/testfile.txt
```

Unmount it and confirm it disappears from the mount output.

Exercise 3: Persistent Mounting with /etc/fstab

Goal: Automatically mount /dev/sda1 at boot.

1. Get the UUID:

```
blkid /dev/sda1
```

2. Edit /etc/fstab with:

```
sudo nano /etc/fstab
```

3. Add this line:

```
UUID=<uuid-from-above> /mnt/data ext4 defaults 0 2
```

4. Test configuration:

```
sudo umount /mnt/data  
sudo mount -a
```

Why is it recommended to use a UUID instead of the raw device name /dev/sda1 in /etc/fstab?

Exercise 4: Using fuser to Detect Open Files

Goal: Identify which processes are keeping the filesystem busy.

1. Re-mount /dev/sda1:

```
sudo mount /dev/sda1 /mnt/data
```

2. Change directory to /mnt/data:

```
cd /mnt/data
```

3. In your main terminal, run:

```
sudo fuser -vm /mnt/data
```

4. Try to unmount:

```
sudo umount /mnt/data
```

5. Use `fuser -k` (with caution) to terminate the process:

```
sudo fuser -k /mnt/data
```

Review

- `mkfs.ext4 /dev/sda1` creates the filesystem.
- `mount / umount` handles runtime mounts.
- `/etc/fstab` makes mount configurations persistent.
- `fuser` shows (and can kill) processes accessing mounted filesystems.