

# Linux System Administration

## Assignment 14\_1 Report

### Assignment: 14\_1

#### Objective

This assignment demonstrates the use of basic Linux commands, user and group management, file ownership changes, and system-level monitoring in a simulated real-world IT environment.

### Task 1: Basic Linux Commands in a Real-World Scenario

#### 1. Check Current Logged-In User and System Information

##### Command:

```
whoami
```

```
uname -a
```

##### Explanation:

- whoami shows the current logged-in user.
- uname -a displays complete system information.

#### 2. Navigate to /projects and List Contents

##### Command:

```
cd /projects
```

```
ls -l
```

##### Explanation:

- Navigates to the /projects directory and lists existing content with details.

### 3. Create New Project Directory and Verify

#### Command:

```
mkdir projectB
```

```
ls -l
```

#### Explanation:

- Creates a new directory projectB and lists it to verify.

### 4. Create a Sample File Inside projectB

#### Command:

```
touch projectB/README.txt
```

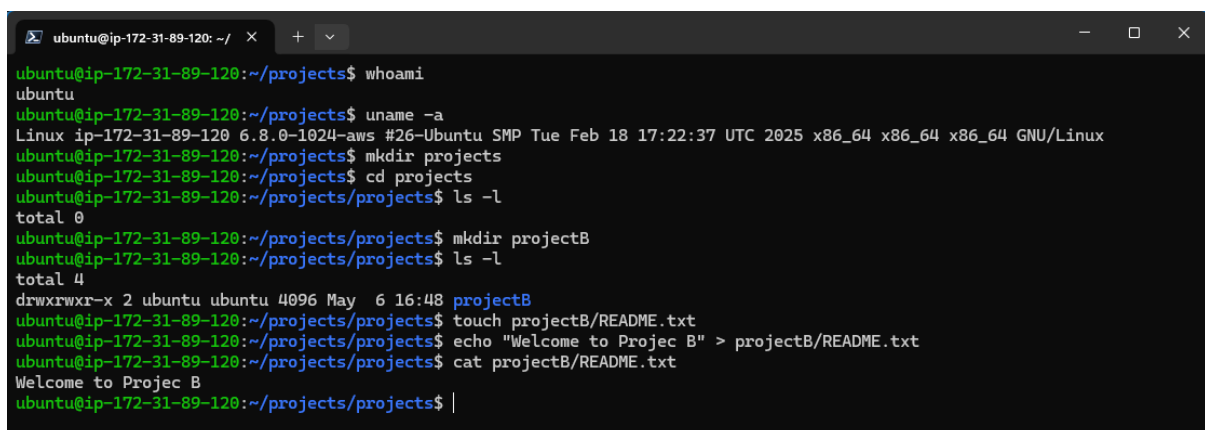
```
echo "Welcome to Project B" > projectB/README.txt
```

```
cat projectB/README.txt
```

#### Explanation:

- Creates and writes to a sample README file.

#### Screenshot:

A terminal window screenshot showing a series of commands and their outputs. The user is in a directory named 'projects'. They run 'whoami' (returns 'ubuntu'), 'uname -a' (shows system info), 'mkdir projects' (creates a new directory), 'cd projects' (changes to the new directory), 'ls -l' (shows an empty directory), 'mkdir projectB' (creates a subdirectory), 'ls -l' (shows 'projectB'), 'touch projectB/README.txt' (creates a file), 'echo "Welcome to Project B" > projectB/README.txt' (writes to the file), and 'cat projectB/README.txt' (outputs 'Welcome to Project B').

```
ubuntu@ip-172-31-89-120: ~/projects$ whoami
ubuntu
ubuntu@ip-172-31-89-120: ~/projects$ uname -a
Linux ip-172-31-89-120 6.8.0-1024-aws #26-Ubuntu SMP Tue Feb 18 17:22:37 UTC 2025 x86_64 x86_64 x86_64 GNU/Linux
ubuntu@ip-172-31-89-120: ~/projects$ mkdir projects
ubuntu@ip-172-31-89-120: ~/projects$ cd projects
ubuntu@ip-172-31-89-120: ~/projects/projects$ ls -l
total 0
ubuntu@ip-172-31-89-120: ~/projects/projects$ mkdir projectB
ubuntu@ip-172-31-89-120: ~/projects/projects$ ls -l
total 4
drwxrwxr-x 2 ubuntu ubuntu 4096 May  6 16:48 projectB
ubuntu@ip-172-31-89-120: ~/projects/projects$ touch projectB/README.txt
ubuntu@ip-172-31-89-120: ~/projects/projects$ echo "Welcome to Project B" > projectB/README.txt
ubuntu@ip-172-31-89-120: ~/projects/projects$ cat projectB/README.txt
Welcome to Project B
ubuntu@ip-172-31-89-120: ~/projects/projects$ |
```

## Task 2: User and Group Permissions Management

### 1. Create New User and Add to Group

#### Command:

```
sudo useradd -m -G developers john
```

```
sudo passwd john
```

**Explanation:**

- Creates a new user john and adds him to developers group.

**Screenshot:**

```
ubuntu@ip-172-31-89-120:~/projects/projects$ sudo useradd -m -G developers john
useradd: group 'developers' does not exist
ubuntu@ip-172-31-89-120:~/projects/projects$ sudo groupadd developers
ubuntu@ip-172-31-89-120:~/projects/projects$ sudo useradd -m -G developers john
```

## 2. Verify User and Group

**Command:**

```
id john
```

**Explanation:**

- Displays UID, GID, and group memberships of john.

**Screenshot:**

```
ubuntu@ip-172-31-89-120:~/projects/projects$ sudo passwd john
New password:
Retype new password:
passwd: password updated successfully
ubuntu@ip-172-31-89-120:~/projects/projects$ id john
uid=1001(john) gid=1002(john) groups=1002(john),1001(developers)
```

## 3. Change Group Ownership of projectB

**Command:**

```
sudo chown :developers /projects/projectB
```

**Explanation:**

- Changes group ownership of the projectB directory to developers.

## 4. Set Proper Permissions

### Command:

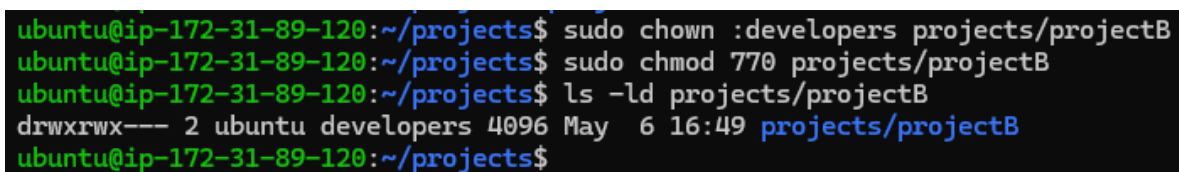
```
sudo chmod 770 /projects/projectB
```

```
ls -ld /projects/projectB
```

### Explanation:

- Gives full permissions to owner and group, no access to others.

### Screenshot:



```
ubuntu@ip-172-31-89-120:~/projects$ sudo chown :developers projects/projectB
ubuntu@ip-172-31-89-120:~/projects$ sudo chmod 770 projects/projectB
ubuntu@ip-172-31-89-120:~/projects$ ls -ld projects/projectB
drwxrwx--- 2 ubuntu developers 4096 May  6 16:49 projects/projectB
ubuntu@ip-172-31-89-120:~/projects$
```

## Task 3: Changing File Ownership

### 1. Make John the Owner of projectB

#### Command:

```
sudo chown john:developers /projects/projectB
```

#### Explanation:

- Assigns john as the new owner of the directory.

### 2. Verify Ownership

#### Command:

```
ls -ld /projects/projectB
```

#### Explanation:

- Verifies that ownership has been updated correctly.

### Screenshot:

```
ubuntu@ip-172-31-89-120: ~/ X + v
ubuntu@ip-172-31-89-120:~/projects$ sudo chown john:developers projects/projectB
ubuntu@ip-172-31-89-120:~/projects$ ls -ld projects/projectB
drwxrwx--- 2 john developers 4096 May  6 16:49 projects/projectB
ubuntu@ip-172-31-89-120:~/projects$
```

## Task 4: System-Level Monitoring Commands

### 1. Check System Uptime

**Command:**

uptime

**Explanation:**

- Displays how long the system has been running and current load.

### 2. Monitor Disk Usage

**Command:**

df -h

**Explanation:**

- Shows disk usage in human-readable format.

### 3. Check Memory Usage

**Command:**

free -m

**Explanation:**

- Displays memory usage in MB.

### 4. Monitor Top Memory-Consuming Processes

**Command:**

ps aux --sort=-%mem | head -5

**Explanation:**

- Lists top 5 memory-consuming processes sorted by usage.

## Screenshot:

```
ubuntu@ip-172-31-89-120: ~/projects$ uptime
16:59:19 up 14 min, 1 user, load average: 0.00, 0.00, 0.00
ubuntu@ip-172-31-89-120:~/projects$ df -h
Filesystem      Size  Used Avail Use% Mounted on
/dev/root        6.8G  1.7G  5.1G  26% /
tmpfs            479M   0  479M   0% /dev/shm
tmpfs            192M  876K  191M   1% /run
tmpfs            5.0M   0   5.0M   0% /run/lock
/dev/xvda16      881M   79M  741M  10% /boot
/dev/xvda15      105M   6.1M   99M   6% /boot/efi
tmpfs            96M   12K   96M   1% /run/user/1000
ubuntu@ip-172-31-89-120:~/projects$ free -m
              total        used        free      shared  buff/cache   available
Mem:           957          321          406           0          383          636
Swap:           0           0           0
ubuntu@ip-172-31-89-120:~/projects$ ps aux --sort=-%mem | head -5
USER      PID %CPU %MEM    VSZ   RSS TTY      STAT START   TIME COMMAND
root      589  0.1  3.2 1329380 31556 ?        Ssl  16:45   0:01 /usr/lib/snapd/snapd
root      102  0.0  2.7 280952 27136 ?        Ssl  16:45   0:00 /sbin/multipathd -d -s
root      713  0.0  2.3 110000 22912 ?        Ssl  16:45   0:00 /usr/bin/python3 /usr/share/unattended-upgrades/unattended-upgrade-shutdown --wait-for-signal
root      584  0.0  2.1 32408 20736 ?        Ss   16:45   0:00 /usr/bin/python3 /usr/bin/networkd-dispatcher --run-startup-triggers
ubuntu@ip-172-31-89-120:~/projects$
```

## Conclusion

This exercise provided hands-on experience with essential Linux administrative tasks, demonstrating how to manage users, control permissions, and monitor system health in a real-world scenario