Linux Commands Assignment 14_2 Report

Assignment: 14_1

Objective

The goal of this assignment is to simulate real-world administrative tasks for managing files, users, permissions, and system resources for a web development team working on **ProjectX**.

Task 1: Basic Linux Commands

Scenario:
Set up a working directory and files for the ProjectX web application.

Step 1: Create project directory and navigate into it

Command:

mkdir /var/www/ProjectX

cd /var/www/ProjectX

Explanation:

- Creates a project directory and enters it.

Step 2: Create files for frontend and backend

Command:

touch index.html app.py README.md

Explanation:

- Creates empty files for frontend, backend, and documentation.

Step 3: Check current working directory

Command:

pwd

Expected Output:

/var/www/ProjectX

Explanation:

- Displays the full path of the current directory.

Step 4: List files with details

Command:

ls -l

Explanation:

- Shows detailed info (owner, permissions, size, timestamp) for each file.

Step 5: Display system disk usage

Command:

df -h

Explanation:

- Displays disk space usage in human-readable format.

Step 6: View file content

Command:

echo "Welcome to ProjectX" > README.md

cat README.md

Explanation:

- Writes to and displays content of README.md.

Screenshot:

```
ubuntu@ip-172-31-89-120:~$ mkdir /var/www/MyProject
mkdir: cannot create directory '/var/www/MyProject': Permission denied
ubuntu@ip-172-31-89-120:~$ sudo mkdir /var/www/MyProject
ubuntu@ip-172-31-89-120:~$ sudo su
root@ip-172-31-89-120:/home/ubuntu# exit
exit
ubuntu@ip-172-31-89-120:~$ cd /var/www/MyProject
ubuntu@ip-172-31-89-120:/var/www/MyProject$ touch index.html app.py README.md
touch: cannot touch 'index.html': Permission denied
touch: cannot touch 'app.py': Permission denied
touch: cannot touch 'README.md': Permission denied
ubuntu@ip-172-31-89-120:/var/www/MyProject$ sudo touch index.html app.py README.md
ubuntu@ip-172-31-89-120:/var/www/MyProject$ pwd
/var/www/MyProject
ubuntu@ip-172-31-89-120:/var/www/MyProject$ ls -l
total 0
-rw-r--r-- 1 root root 0 May  6 17:06 README.md
-rw-r--r-- 1 root root 0 May  6 17:06 app.py
-rw-r--r-- 1 root root 0 May  6 17:06 index.html
ubuntu@ip-172-31-89-120:/var/www/MyProject$ 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:/var/www/MyProject$ echo "Welcome to MyProject" > README.md
-bash: README.md: Permission denied
ubuntu@ip-172-31-89-120:/var/www/MyProject$ sudo echo "Welcome to MyProject" > README.md
-bash: README.md: Permission denied
ubuntu@ip-172-31-89-120:/var/www/MyProject$ sudo su
root@ip-172-31-89-120:/var/www/MyProject# sudo echo "Welcome to MyProject" > README.md
root@ip-172-31-89-120:/var/www/MyProject# exit
exit
ubuntu@ip-172-31-89-120:/var/www/MyProject$ cat README.md
Welcome to MyProject
ubuntu@ip-172-31-89-120:/var/www/MyProject$
```

Task 2: User and Group Permission Management

Scenario:
Create developer accounts and assign permissions to the project directory.

Step 1: Create group and users

Command:

groupadd devteam

useradd bhatti

useradd malik

usermod -aG devteam bhatti

usermod -aG devteam malik

Explanation:

- Creates a group devteam and adds users to it.

Step 2: Assign group ownership to project

Command:

chgrp -R devteam /var/www/ProjectX

Explanation:

- Changes group ownership of the directory recursively.

Step 3: Set directory permissions

Command:

chmod -R 770 /var/www/ProjectX

Explanation:

- Grants read/write/execute to owner and group, denies access to others.

Step 4: Verify permissions

Command:

ls -ld /var/www/ProjectX

Expected Output:

drwxrwx--- 2 root devteam 4096 Apr 26 10:00 ProjectX

Explanation:

- Confirms directory permissions and group ownership.

Step 5: Check group membership

Command:

groups bhatti
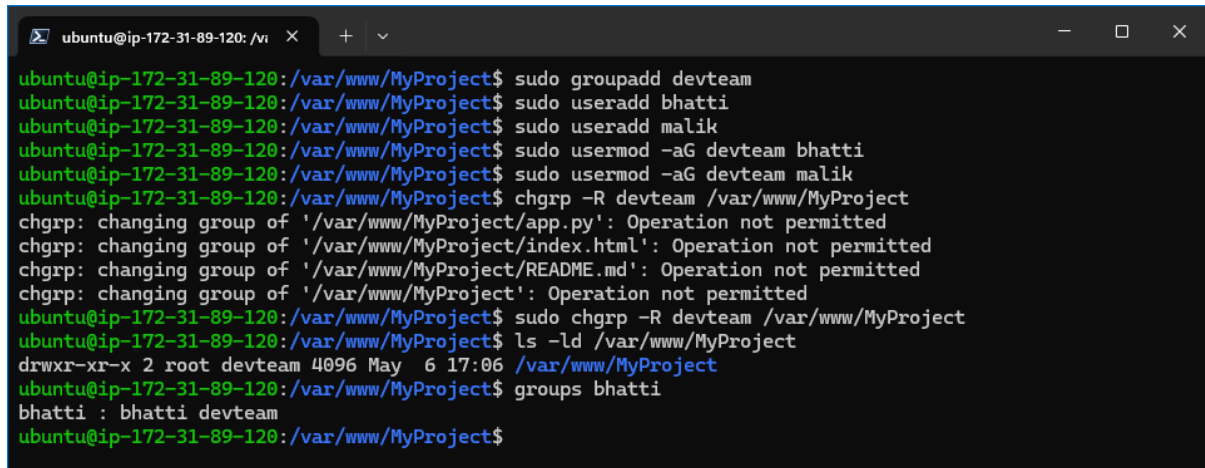
Expected Output:

bhatti : bhatti devteam

Explanation:

- Verifies bhatti is in the devteam group.

Screenshot:


```
ubuntu@ip-172-31-89-120:/var/www/MyProject$ sudo groupadd devteam
ubuntu@ip-172-31-89-120:/var/www/MyProject$ sudo useradd bhatti
ubuntu@ip-172-31-89-120:/var/www/MyProject$ sudo useradd malik
ubuntu@ip-172-31-89-120:/var/www/MyProject$ sudo usermod -aG devteam bhatti
ubuntu@ip-172-31-89-120:/var/www/MyProject$ sudo usermod -aG devteam malik
ubuntu@ip-172-31-89-120:/var/www/MyProject$ chgrp -R devteam /var/www/MyProject
chgrp: changing group of '/var/www/MyProject/app.py': Operation not permitted
chgrp: changing group of '/var/www/MyProject/index.html': Operation not permitted
chgrp: changing group of '/var/www/MyProject/README.md': Operation not permitted
chgrp: changing group of '/var/www/MyProject': Operation not permitted
ubuntu@ip-172-31-89-120:/var/www/MyProject$ sudo chgrp -R devteam /var/www/MyProject
ubuntu@ip-172-31-89-120:/var/www/MyProject$ ls -ld /var/www/MyProject
drwxr-xr-x 2 root devteam 4096 May  6 17:06 /var/www/MyProject
ubuntu@ip-172-31-89-120:/var/www/MyProject$ groups bhatti
bhatti : bhatti devteam
ubuntu@ip-172-31-89-120:/var/www/MyProject$
```

Task 3: Change Ownership

Scenario:
Assign bhatti as the lead developer and owner of project files.

Step 1: Change directory ownership

Command:

chown -R bhatti:devteam /var/www/ProjectX

Explanation:

- Transfers ownership of the files to user bhatti and group devteam.

Step 2: Verify ownership

Command:

ls -l /var/www/ProjectX

Expected Output (example):

-rw-rw---- 1 bhatti devteam 0 Apr 26 10:00 app.py

-rw-rw---- 1 bhatti devteam 0 Apr 26 10:00 index.html

-rw-rw---- 1 bhatti devteam 0 Apr 26 10:00 README.md

Explanation:

- Shows updated file ownership.

Step 3: Switch to bhatti and create new file

Command:

su - bhatti

cd /var/www/ProjectX
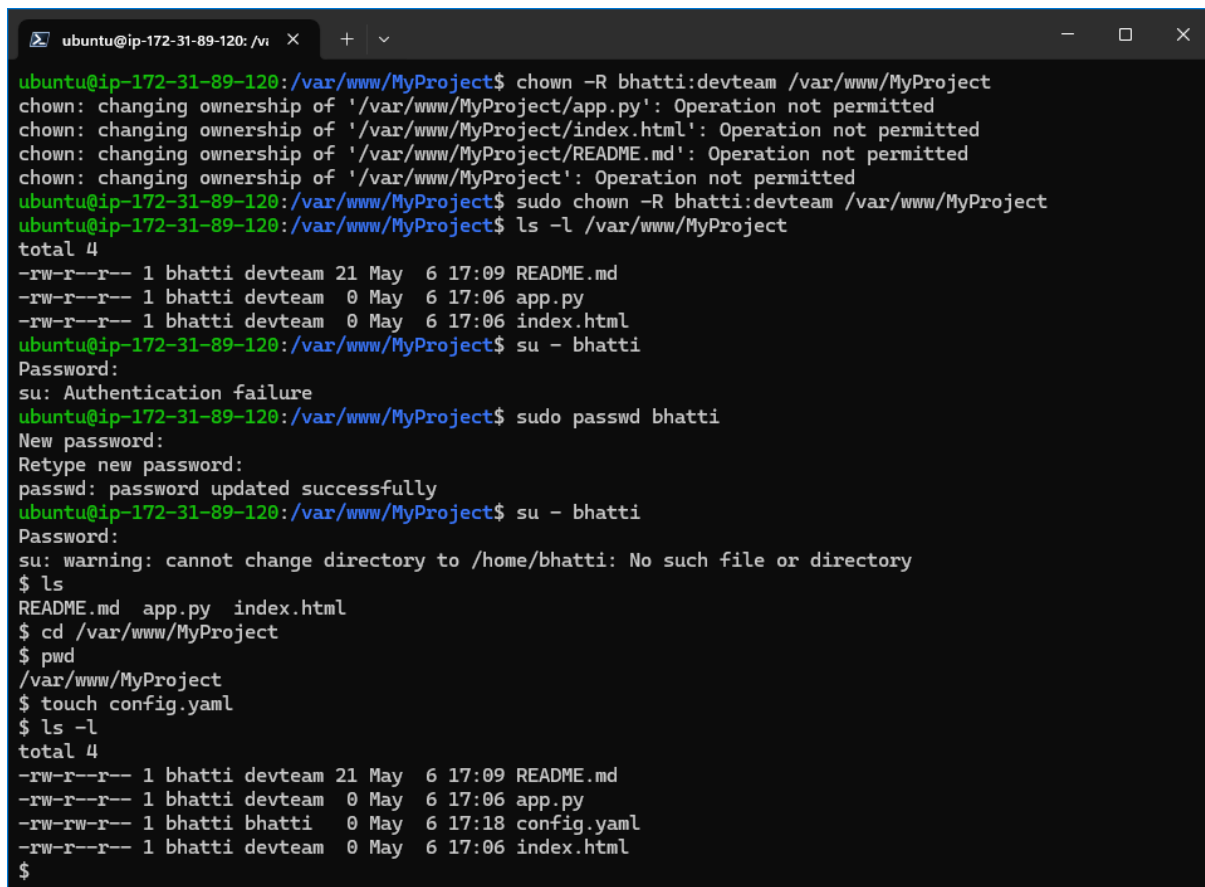
touch config.yaml

ls -l

Explanation:

- Switches user context to bhatti, creates a new config file, and verifies it.

Screenshot:

Task 4: System-Level Commands

Scenario:
Monitor system performance and check web application status.

Step 1: Monitor system resources

Command:

top

Explanation:

- Displays real-time CPU and memory usage.

Screenshot:

Step 2: Check running processes

Command:

ps aux | grep ProjectX

Explanation:

- Lists any running processes related to ProjectX.

Step 3: View system logs

Command:

tail -n 50 /var/log/syslog

Explanation:

- Displays the last 50 lines of the system log for debugging and monitoring.

Screenshot:

Conclusion

This assignment provided practical experience in Linux system administration, simulating common tasks like user/group management, file permission setup, and system resource monitoring for a web development team.