

# Linux Commands Assignment

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## Scenario: Web Development Team Management

You're working as a **System Administrator** for a company that hosts web applications. Your task is to manage files, users, permissions, and system resources for a development team working on a project called "**ProjectX**".

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## Assignment Structure

### Objective:

Perform the following tasks using basic Linux commands while simulating a real-world scenario.

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## Task 1: Basic Linux Commands

### Scenario:

Developers need a workspace set up for **ProjectX**.

### Steps & Commands:

1. Create project directory and navigate into it:

```
ubuntu@ip-172-31-24-202:~/Assignment14_2$ mkdir var var/www var/www/projectX
ubuntu@ip-172-31-24-202:~/Assignment14_2$ cd var/www/projectX
ubuntu@ip-172-31-24-202:~/var/www/projectX$
```

2. Create files for frontend and backend:

```
ubuntu@ip-172-31-24-202:~/Assignment14_2/var/www/projectX$ touch index.html app.py README.md
ubuntu@ip-172-31-24-202:~/Assignment14_2/var/www/projectX$
```

3. Check current working directory:

```
ubuntu@ip-172-31-24-202:~/Assignment14_2/var/www/projectX$ pwd  
/home/ubuntu/Assignment14_2/var/www/projectX  
ubuntu@ip-172-31-24-202:~/Assignment14_2/var/www/projectX$
```

4. List files with detailed information:

```
ubuntu@ip-172-31-24-202:~/Assignment14_2/var/www/projectX$ ls -l  
total 0  
-rw-rw-r-- 1 ubuntu ubuntu 0 May 13 12:59 README.md  
-rw-rw-r-- 1 ubuntu ubuntu 0 May 13 12:59 app.py  
-rw-rw-r-- 1 ubuntu ubuntu 0 May 13 12:59 index.html  
ubuntu@ip-172-31-24-202:~/Assignment14_2/var/www/projectX$
```

5. Display system disk usage: df -h

```
ubuntu@ip-172-31-24-202:~/Assignment14_2/var/www/projectX$ df -h  
Filesystem      Size  Used Avail Use% Mounted on  
/dev/root       6.8G  2.3G  4.5G  34% /  
tmpfs           458M    0  458M   0% /dev/shm  
tmpfs           183M  880K  182M   1% /run  
tmpfs           5.0M    0  5.0M   0% /run/lock  
efivarfs        128K  3.8K  120K   4% /sys/firmware/efi/efivars  
/dev/nvme0n1p16  881M  79M  741M  10% /boot  
/dev/nvme0n1p15  105M  6.1M  99M   6% /boot/efi  
tmpfs            92M   12K  92M   1% /run/user/1000  
ubuntu@ip-172-31-24-202:~/Assignment14_2/var/www/projectX$
```

6. View file content:

```
ubuntu@ip-172-31-24-202:~/Assignment14_2/var/www/projectX$ echo "Welcome to projectX" > README.md  
ubuntu@ip-172-31-24-202:~/Assignment14_2/var/www/projectX$ cat README.md  
Welcome to projectX  
ubuntu@ip-172-31-24-202:~/Assignment14_2/var/www/projectX$
```

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## Task 2: User and Group Permission Management

Scenario:

Create a user group for developers and assign permissions accordingly.

### Steps & Commands:

#### 1. Create a developer group and users:

```
ubuntu@ip-172-31-24-202:~/Assignment14_2/var/www/projectX$ sudo groupadd devTeam
ubuntu@ip-172-31-24-202:~/Assignment14_2/var/www/projectX$ sudo useradd Ali
ubuntu@ip-172-31-24-202:~/Assignment14_2/var/www/projectX$ sudo useradd Faizan
ubuntu@ip-172-31-24-202:~/Assignment14_2/var/www/projectX$ sudo usermod -aG devTeam Ali
ubuntu@ip-172-31-24-202:~/Assignment14_2/var/www/projectX$ sudo usermod -aG devTeam Faizan
ubuntu@ip-172-31-24-202:~/Assignment14_2/var/www/projectX$
```

#### 2. Assign the group ownership of the project directory:

```
ubuntu@ip-172-31-24-202:~/Assignment14_2/var/www/projectX$ sudo chgrp -R devTeam .
ubuntu@ip-172-31-24-202:~/Assignment14_2/var/www/projectX$
```

#### 3. Set appropriate directory permissions (developers can read/write, others can only read):

```
ubuntu@ip-172-31-24-202:~/Assignment14_2/var/www/projectX$ chmod -R 770 .
ubuntu@ip-172-31-24-202:~/Assignment14_2/var/www/projectX$
```

#### 4. Verify permissions:

```
ubuntu@ip-172-31-24-202:~/Assignment14_2/var/www/projectX$ ls -ld .
drwxrwx--- 2 ubuntu devTeam 4096 May 13 12:59 .
ubuntu@ip-172-31-24-202:~/Assignment14_2/var/www/projectX$
```

#### 5. Check user group memberships:

```
ubuntu@ip-172-31-24-202:~/Assignment14_2/var/www/projectX$ groups Faizan
Faizan : Faizan devTeam
ubuntu@ip-172-31-24-202:~/Assignment14_2/var/www/projectX$ |
```

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## Task 3: Change Ownership

### Scenario:

The lead developer (**Faizan**) should be the owner of the project files.

### Steps & Commands:

1. Change ownership of the directory to **bhatti** and group **devteam**:

```
ubuntu@ip-172-31-24-202:~/Assignment14_2/var/www/projectX$ sudo chown -R Faizan:devTeam .
ubuntu@ip-172-31-24-202:~/Assignment14_2/var/www/projectX$ |
```

2. Verify ownership changes:

```
ubuntu@ip-172-31-24-202:~/Assignment14_2/var/www/projectX$ sudo ls -l .
total 4
-rwxrwx--- 1 Faizan devTeam 20 May 13 13:02 README.md
-rwxrwx--- 1 Faizan devTeam 0 May 13 12:59 app.py
-rwxrwx--- 1 Faizan devTeam 0 May 13 12:59 index.html
ubuntu@ip-172-31-24-202:~/Assignment14_2/var/www/projectX$ |
```

3. Switch to user **bhatti** and create a new file:

```
su - bhatti cd
/var/www/ProjectX
touch config.yaml ls
-l
```

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## Task 4: System-Level Commands

### Scenario:

Monitor system performance and manage services for the web application.

### Steps & Commands:

1. Check system resource usage (CPU, memory):

```
Faizan@ip-172-31-24-202:~$ top
top - 13:58:22 up 1:08, 2 users, load average: 0.00, 0.00, 0.00
Tasks: 109 total, 1 running, 108 sleeping, 0 stopped, 0 zombie
%Cpu(s): 0.0 us, 0.0 sy, 0.0 ni,100.0 id, 0.0 wa, 0.0 hi, 0.0 si, 0.0 st
MiB Mem : 914.1 total, 366.2 free, 351.4 used, 350.3 buff/cache
MiB Swap: 0.0 total, 0.0 free, 0.0 used. 562.7 avail Mem

      PID USER      PR  NI    VIRT    RES    SHR S %CPU %MEM     TIME+ COMMAND
1411 Faizan    20   0 12344  5888 3712 R  0.3  0.6  0:00.01 top
  1 root      20   0 22220 13292 9580 S  0.0  1.4  0:01.16 systemd
  2 root      20   0     0     0  0 S  0.0  0.0  0:00.00 kthreadd
  3 root      20   0     0     0  0 S  0.0  0.0  0:00.00 pool_workqueue_release
  4 root      0 -20   0     0  0 I  0.0  0.0  0:00.00 kworker/R-rcu_g
  5 root      0 -20   0     0  0 I  0.0  0.0  0:00.00 kworker/R-rcu_p
  6 root      0 -20   0     0  0 I  0.0  0.0  0:00.00 kworker/R-slub_
  7 root      0 -20   0     0  0 I  0.0  0.0  0:00.00 kworker/R-netns
  9 root      0 -20   0     0  0 I  0.0  0.0  0:00.00 kworker/0:0H-events_highpri
 10 root     20   0     0     0  0 I  0.0  0.0  0:00.46 kworker/0:1-events
 12 root     0 -20   0     0  0 I  0.0  0.0  0:00.00 kworker/R-mm_pe
 13 root     20   0     0     0  0 I  0.0  0.0  0:00.00 rcu_tasks_rude_kthread
 14 root     20   0     0     0  0 I  0.0  0.0  0:00.00 rcu_tasks_trace_kthread
 15 root     20   0     0     0  0 S  0.0  0.0  0:00.02 ksoftirqd/0
 16 root     20   0     0     0  0 I  0.0  0.0  0:00.10 rcu_sched
 17 root     rt   0     0     0  0 S  0.0  0.0  0:00.01 migration/0
 18 root    -51   0     0     0  0 S  0.0  0.0  0:00.00 idle_inject/0
 19 root     20   0     0     0  0 S  0.0  0.0  0:00.00 cpuhp/0
 20 root     20   0     0     0  0 S  0.0  0.0  0:00.00 cpuhp/1
 21 root    -51   0     0     0  0 S  0.0  0.0  0:00.00 idle_inject/1
```

Top: provides a dynamic, real-time view of

running processes and system resource usage.

2. Check running processes for `projectX`:

```
ubuntu@ip-172-31-24-202:~/Assignment14_2/var/www/projectX$ ps aux | grep projectX
ubuntu      1650  0.0  0.2  7080 2176 pts/1    S+   14:05   0:00 grep --color=auto projectX
ubuntu@ip-172-31-24-202:~/Assignment14_2/var/www/projectX$
```

`ps aux`: Lists all running processes for all

users.

grep projectX: Filters the output to only

show lines containing "projectX"

### 3. View system logs for troubleshooting:

```
ubuntu@ip-172-31-24-202:/var/www/projectX$ tail -n 50 /var/log/syslog
2025-05-13T13:16:13.816711+00:00 ip-172-31-24-202 amazon-ssm-agent.amazon-ssm-agent[542]: 2025-05-13 13:16:13.6601 ERROR [CredentialRefresher] Retrieve credentials produced
retrieved for ec2 identity. Default Host Management Err: error calling RequestManagedInstanceIdRoleToken: AccessDeniedException: Systems Manager's instance management role is
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2025-05-13T13:16:13.816784+00:00 ip-172-31-24-202 amazon-ssm-agent.amazon-ssm-agent[542]: #011status code: 400, request id: 3ce2a232-c5b8-4e31-b2a4-bf4a1f10983c
2025-05-13T13:16:13.917107+00:00 ip-172-31-24-202 amazon-ssm-agent.amazon-ssm-agent[542]: 2025-05-13 13:16:13.6601 INFO [CredentialRefresher] Sleeping for 25m34s before retr
2025-05-13T13:17:01.335089+00:00 ip-172-31-24-202 CRON[11@p]: (root) CMD (cd / && run-parts --report /etc/cron.hourly)
2025-05-13T13:20:17.162578+00:00 ip-172-31-24-202 systemd[1]: Starting sysstat-collect.service - system activity accounting tool...
2025-05-13T13:20:17.169869+00:00 ip-172-31-24-202 systemd[1]: sysstat-collect.service: Deactivated successfully.
2025-05-13T13:20:17.170109+00:00 ip-172-31-24-202 systemd[1]: Finished sysstat-collect.service - system activity accounting tool.
2025-05-13T13:25:01.3477099+00:00 ip-172-31-24-202 CRON[11@p]: (root) CMD (command -v debian-sal >/dev/null && debian-sal 1 1)
2025-05-13T13:30:17.1634333+00:00 ip-172-31-24-202 systemd[1]: Starting sysstat-collect.service - system activity accounting tool...
2025-05-13T13:30:17.167965+00:00 ip-172-31-24-202 systemd[1]: sysstat-collect.service: Deactivated successfully.
2025-05-13T13:30:17.168203+00:00 ip-172-31-24-202 systemd[1]: Finished sysstat-collect.service - system activity accounting tool.
2025-05-13T13:35:01.355862+00:00 ip-172-31-24-202 systemd[1]: (root) CMD (command -v debian-sal >/dev/null && debian-sal 1 1)
2025-05-13T13:40:17.162836+00:00 ip-172-31-24-202 systemd[1]: Starting sysstat-collect.service - system activity accounting tool...
2025-05-13T13:40:17.167824+00:00 ip-172-31-24-202 systemd[1]: sysstat-collect.service: Deactivated successfully.
2025-05-13T13:41:07.666243+00:00 ip-172-31-24-202 amazon-ssm-agent.amazon-ssm-agent[542]: 2025-05-13 13:41:47.66017 WARN EC2RoleProvider Failed to connect to Systems Manager
s. Err: retrieved credential failed to report to ssm. Error: EC2RoleRequestError: no EC2 instance role found
2025-05-13T13:41:07.665591+00:00 ip-172-31-24-202 amazon-ssm-agent.amazon-ssm-agent[542]: caused by: EC2MetadataError: failed to make EC2Metadata request
2025-05-13T13:41:07.665625+00:00 ip-172-31-24-202 amazon-ssm-agent.amazon-ssm-agent[542]: <?xml version="1.0" encoding="iso-8859-1"?>
2025-05-13T13:41:07.665642+00:00 ip-172-31-24-202 amazon-ssm-agent.amazon-ssm-agent[542]: <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
2025-05-13T13:41:07.665657+00:00 ip-172-31-24-202 amazon-ssm-agent.amazon-ssm-agent[542]: #011#011 "http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
2025-05-13T13:41:07.665672+00:00 ip-172-31-24-202 amazon-ssm-agent.amazon-ssm-agent[542]: <html xmlns="http://www.w3.org/1999/xhtml" xml:lang="en" lang="en">
2025-05-13T13:41:07.665688+00:00 ip-172-31-24-202 amazon-ssm-agent.amazon-ssm-agent[542]: <head>
2025-05-13T13:41:07.665703+00:00 ip-172-31-24-202 amazon-ssm-agent.amazon-ssm-agent[542]: <title>404 - Not Found</title>
2025-05-13T13:41:07.665718+00:00 ip-172-31-24-202 amazon-ssm-agent.amazon-ssm-agent[542]: </head>
2025-05-13T13:41:07.665732+00:00 ip-172-31-24-202 amazon-ssm-agent.amazon-ssm-agent[542]: <body>
2025-05-13T13:41:07.665746+00:00 ip-172-31-24-202 amazon-ssm-agent.amazon-ssm-agent[542]: <h1>404 - Not Found</h1>
2025-05-13T13:41:07.665761+00:00 ip-172-31-24-202 amazon-ssm-agent.amazon-ssm-agent[542]: </body>
2025-05-13T13:41:07.665784+00:00 ip-172-31-24-202 amazon-ssm-agent.amazon-ssm-agent[542]: </html>
2025-05-13T13:41:07.665803+00:00 ip-172-31-24-202 amazon-ssm-agent.amazon-ssm-agent[542]: #011status code: 404, request id:
2025-05-13T13:41:07.762538+00:00 ip-172-31-24-202 amazon-ssm-agent.amazon-ssm-agent[542]: 2025-05-13 13:41:47.70983 ERROR EC2RoleProvider Failed to connect to Systems Manager
Line RequestManagedInstanceIdRoleToken: AccessDeniedException: Systems Manager's instance management role is not configured for account: 205842488109
2025-05-13T13:41:07.762622+00:00 ip-172-31-24-202 amazon-ssm-agent.amazon-ssm-agent[542]: #011status code: 400, request id: 8bf20682-651e-45e9-a03b-1794686d0cc0
2025-05-13T13:41:07.862923+00:00 ip-172-31-24-202 amazon-ssm-agent.amazon-ssm-agent[542]: 2025-05-13 13:41:47.70983 ERROR [CredentialRefresher] Retrieve credentials produced
retrieved for ec2 identity. Default Host Management Err: error calling RequestManagedInstanceIdRoleToken: AccessDeniedException: Systems Manager's instance management role is
109
```