Mini Project 1 – User & Group Management (Group 14)

[Cover Page] Title: Mini Project 1 – User & Group Management Group Number: 14
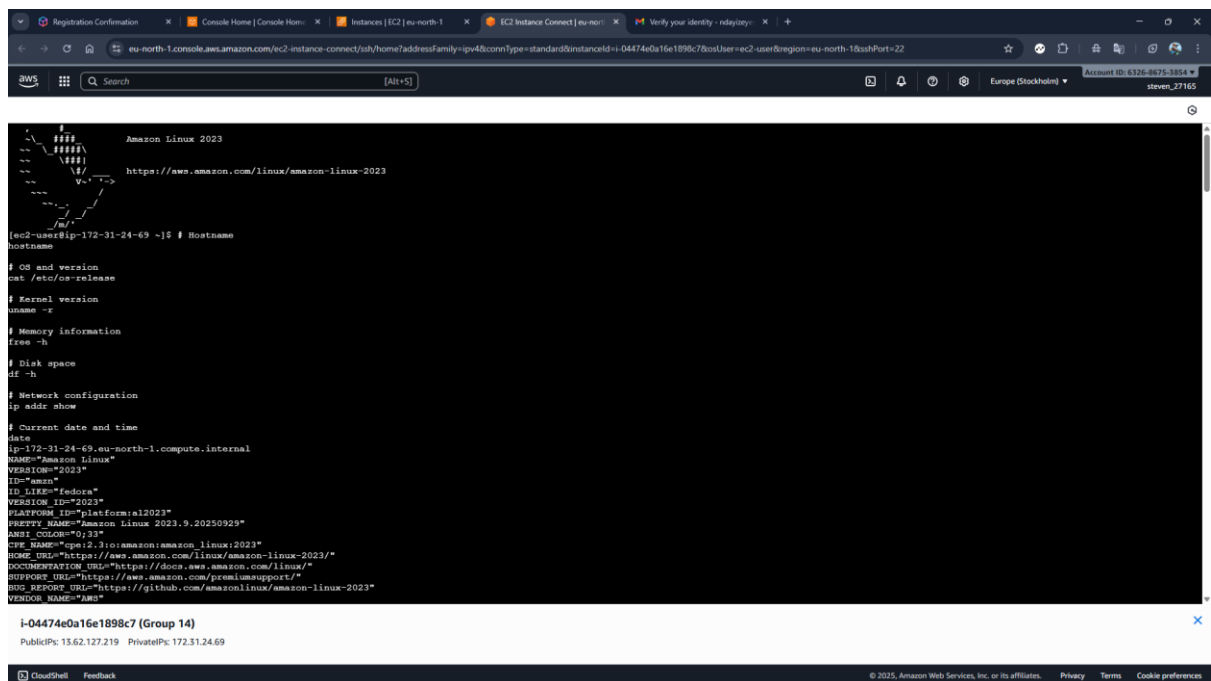Members: Ndayizeye Steven 27165,akize isreal 25883

Date: October 2025

Contents

Part 0 – AWS Setup

Item	Details
Instance ID	i-04474e0a16e1898c7
Public IP	13.62.127.219
Private IP	172.31.24.69
Region	Rwanda
Instance Type	t3.micro
AMI	ami-04c08fd8aa14af291
Screenshot	below
Screenshot	below

Part 1 – System Preparation

Command
hostname
cat /etc/os-release
 uname -r

free -h

df -h

ip addr show
date
ls -ld /opt/techstart

```
[ec2-user@ip-172-31-24-69 ~]$ # Hostname
hostname

# OS and version
cat /etc/os-release

# Kernel version
uname -r

# Memory information
free -h

# Disk space
df -h

# Network configuration
ip addr show

# Current date and time
date
ip-172-31-24-69.eu-north-1.compute.internal
NAME="Amazon Linux"
VERSION="2023"
ID="amzn"
ID_LIKE="fedora"
VERSION_ID="2023"
PLATFORM_ID="platform:al2023"
PRETTY_NAME="Amazon Linux 2023.9.20250929"
ANSI_COLOR="0;33"
CPE_NAME="cpe:2.3:o:amazon:amazon_linux:2023"
HOME_URL="https://aws.amazon.com/linux/amazon-linux-2023/"
DOCUMENTATION_URL="https://docs.aws.amazon.com/linux/"
SUPPORT_URL="https://aws.amazon.com/premiumsupport/"
BUG_REPORT_URL="https://github.com/amazonlinux/amazon-linux-2023"
VENDOR_NAME="AWS"
VENDOR_URL="https://aws.amazon.com/"
SUPPORT_END="2029-06-30"
6.1.153-175.280.amzn2023.x86_64
                total        used        free      shared  buff/cache   available
Mem:           904Mi       167Mi       522Mi       0.0Ki       214Mi       607Mi
Swap:             0B          0B          0B
Filesystem      Size  Used Avail Use% Mounted on
devtmpfs        4.0M     0  4.0M   0% /dev
tmpfs           453M     0  453M   0% /dev/shm
```

```
tmpfs            181M  432K  181M   1% /run
/dev/nvme0n1p1   8.0G  1.6G  6.4G  20% /
tmpfs            453M     0  453M   0% /tmp
/dev/nvme0n1p128  10M  1.3M  8.7M  13% /boot/efi
tmpfs             91M     0   91M   0% /run/user/1000
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
       valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host noprefixroute
       valid_lft forever preferred_lft forever
2: ens5: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 9001 qdisc mq state UP group default qlen 1000
    link/ether 06:be:95:4f:e2:83 brd ff:ff:ff:ff:ff:ff
    altname enp0s5
    altname eni-06f1dee41f9ae4e33
    altname device-number-0.0
    inet 172.31.24.69/20 metric 512 brd 172.31.31.255 scope global dynamic ens5
       valid_lft 3321sec preferred_lft 3321sec
    inet6 fe80::4be:95ff:fe4f:e283/64 scope link proto kernel_ll
       valid_lft forever preferred_lft forever
Wed Oct  8 09:13:20 UTC 2025
```

Part 2 – Group Creation

Group Name	GID	Purpose
backend-dev		Backend Developers
frontend-dev		Frontend Developers
devops-team		DevOps Engineers
dev-all		All Developers
team-leads		Team Leaders

Screenshots

```
backend3:x:1003:1001:Brown:/home/backend3:/bin/bash
stapdev:x:158:
backend-dev:x:1001:
dev-all:x:1002:backend1,backend2,backend3
[ec2-user@ip-172-31-24-69 ~]$ backend-dev:x:1001:
dev-all:x:1002:backend1,backend2,backend3
-bash: backend-dev:x:1001:: command not found
-bash: dev-all:x:1002:backend1,backend2,backend3: command not found
[ec2-user@ip-172-31-24-69 ~]$ sudo passwd backend1
sudo passwd backend2
sudo passwd backend3
Changing password for user backend1.
New password:
Retype new password:
passwd: all authentication tokens updated successfully.
Changing password for user backend2.
New password:
Retype new password:
passwd: all authentication tokens updated successfully.
Changing password for user backend3.
New password:
Retype new password:
passwd: all authentication tokens updated successfully.
[ec2-user@ip-172-31-24-69 ~]$ sudo useradd -m -c "Diana Miller" -s /bin/bash -g frontend-dev -G dev-all frontend1
sudo useradd -m -c "Evan Garcia" -s /bin/bash -g frontend-dev -G dev-all frontend2
sudo useradd -m -c "Faith Williams" -s /bin/bash -g frontend-dev -G dev-all frontend3
useradd: group 'frontend-dev' does not exist
useradd: group 'frontend-dev' does not exist
useradd: group 'frontend-dev' does not exist
[ec2-user@ip-172-31-24-69 ~]$ sudo groupadd frontend-dev
sudo groupadd devops-team
sudo groupadd team-leads
[ec2-user@ip-172-31-24-69 ~]$ backend-dev
frontend-dev
devops-team
dev-all
team-leads
-bash: backend-dev: command not found
-bash: frontend-dev: command not found
-bash: devops-team: command not found
-bash: dev-all: command not found
-bash: team-leads: command not found
[ec2-user@ip-172-31-24-69 ~]$ ^C
[ec2-user@ip-172-31-24-69 ~]$ getent group | grep dev
stapdev:x:158:
```

i-04474e0a16e1898c7 (Group 14)

PublicIPs: 13.62.127.219   PrivateIPs: 172.31.24.69

```
[ec2-user@ip-172-31-24-69 ~]$ sudo mkdir -p /opt/techstart
ls -ld /opt/techstart
drwxr-xr-x. 2 root root 6 Oct  8 09:14 /opt/techstart
[ec2-user@ip-172-31-24-69 ~]$ ^[[200~# Create groups
-bash: $'\E[200~#': command not found
[ec2-user@ip-172-31-24-69 ~]$ sudo groupadd backend-dev
sudo groupadd frontend-dev
sudo groupadd devops-team
sudo groupadd dev-all
sudo groupadd team-leads

# Verify creation
getent group | grep dev
^[[201~[ec2-user@ip-172-31-24-69 ~]$
[ec2-user@ip-172-31-24-69 ~]$ cat /etc/group | grep dev
stapdev:x:158:
backend-dev:x:1001:          sudo useradd -m -c "steven" -s /bin/bash -g backend-dev -G dev-all backend1
sudo useradd -m -c "akize" -s /bin/bash -g backend-dev -G dev-all backend2backend-dev -G dev-all backend1
sudo useradd -m -c "Brown" -s /bin/bash -g backend-dev -G dev-all backend3
useradd: group 'dev-all' does not exist -g backend-dev -G dev-all backend3
useradd: group 'dev-all' does not exist
useradd: group 'dev-all' does not exist
[ec2-user@ip-172-31-24-69 ~]$ ^C
[ec2-user@ip-172-31-24-69 ~]$ sudo groupadd dev-all
[ec2-user@ip-172-31-24-69 ~]$ getent group | grep dev
stapdev:x:158:
backend-dev:x:1001:
dev-all:x:1002:
[ec2-user@ip-172-31-24-69 ~]$ sudo useradd -m -c "steven" -s /bin/bash -g backend-dev -G dev-all backend1
sudo useradd -m -c "akize" -s /bin/bash -g backend-dev -G dev-all backend2
sudo useradd -m -c "Brown" -s /bin/bash -g backend-dev -G dev-all backend3
[ec2-user@ip-172-31-24-69 ~]$ getent passwd | grep backend
getent group | grep dev
backend1:x:1001:1001:steven:/home/backend1:/bin/bash
backend2:x:1002:1001:akize:/home/backend2:/bin/bash
backend3:x:1003:1001:Brown:/home/backend3:/bin/bash
stapdev:x:158:
backend-dev:x:1001:
dev-all:x:1002:backend1,backend2,backend3
[ec2-user@ip-172-31-24-69 ~]$ backend-dev:x:1001:
dev-all:x:1002:backend1,backend2,backend3
-bash: backend-dev:x:1001:: command not found
-bash: dev-all:x:1002:backend1,backend2,backend3: command not found
[ec2-user@ip-172-31-24-69 ~]$ sudo passwd backend1
sudo passwd backend2
```

i-04474e0a16e1898c7 (Group 14)

PublicIPs: 13.62.127.219   PrivateIPs: 172.31.24.69

```
-bash: team-leads: command not found
[ec2-user@ip-172-31-24-69 ~]$ ^C
[ec2-user@ip-172-31-24-69 ~]$ getent group | grep dev
stapdev:x:158:
backend-dev:x:1001:
dev-all:x:1002:backend1,backend2,backend3
frontend-dev:x:1003:
devops-team:x:1004:
[ec2-user@ip-172-31-24-69 ~]$ sudo useradd -m -c "Patricia" -s /bin/bash -g frontend-dev -G dev-all frontend1
sudo useradd -m -c "Daniel" -s /bin/bash -g frontend-dev -G dev-all frontend2
sudo useradd -m -c "Ruth" -s /bin/bash -g frontend-dev -G dev-all frontend3
[ec2-user@ip-172-31-24-69 ~]$ sudo useradd -m -c "James" -s /bin/bash -g devops-team -G dev-all devops1
sudo useradd -m -c "Kelly" -s /bin/bash -g devops-team -G dev-all devops2
sudo useradd -m -c "Peter" -s /bin/bash -g devops-team -G dev-all devops3
[ec2-user@ip-172-31-24-69 ~]$ sudo useradd -m -c "Steven LeL^Cs /bin/bash -g team-leads -G dev-all,sudo
 teamlead

[ec2-user@ip-172-31-24-69 ~]$ sudo useradd -m -c "Steven27165" -s /bin/bash -g team-leads -G dev-all,sudo teamlead
useradd: group 'sudo' does not exist
[ec2-user@ip-172-31-24-69 ~]$ sudo useradd -m -c "Steven27165" -s /bin/bash -g team-leads -G dev-all,wheel teamlead
[ec2-user@ip-172-31-24-69 ~]$ id teamlead
uid=1010(teamlead) gid=1005(team-leads) groups=1005(team-leads),10(wheel),1002(dev-all)
[ec2-user@ip-172-31-24-69 ~]$ # Create a sudo group
sudo groupadd sudo

# Allow members of 'sudo' group to use sudo
echo "%sudo  ALL=(ALL)  ALL" | sudo tee /etc/sudoers.d/sudo-group

# Now create the teamlead user as per instructions
sudo useradd -m -c "Steven27165" -s /bin/bash -g team-leads -G dev-all,sudo teamlead
%sudo  ALL=(ALL)  ALL
useradd: user 'teamlead' already exists
```

Part 3 – User Account Creation

Username	Full Name	UID	Primary Group	Secondary Groups	Home Directory	Shell
backend1	Steven		backend-dev	dev-all	/home/backend1	/bin/bash
backend2	Akize		backend-dev	dev-all	/home/backend2	/bin/bash
backend3	Brown		backend-dev	dev-all	/home/backend3	/bin/bash
frontend1	Patricia		frontend-dev	dev-all	/home/frontend1	/bin/bash
frontend2	Daniel		frontend-dev	dev-all	/home/frontend2	/bin/bash
frontend3	Ruth		frontend-dev	dev-all	/home/frontend3	/bin/bash
devops1	James		devops-team	dev-all	/home/devops1	/bin/bash
devops2	Kelly		devops-team	dev-all	/home/devops2	/bin/bash
devops3	Peter		devops-team	dev-all	/home/devops3	/bin/bash
teamlead	Steven Lead		team-leads	dev-all, wheel	/home/teamlead	/bin/bash

Part 4 – Shared Directory Structure & Permissions

Folder	Owner	Group	Permissions	SGID
/opt/techstart/backend	root	backend-dev	rwxrws---	Yes
/opt/techstart/frontend	root	frontend-dev	rwxrws---	Yes
/opt/techstart/devops	root	devops-team	rwxrws---	Yes
/opt/techstart/shared	root	dev-all	rwxrws---	Yes

```
[ec2-user@ip-172-31-24-69 ~]$ su - teamlead
sudo whoami
Password:
su: Authentication failure
root
[ec2-user@ip-172-31-24-69 ~]$ su - teamlead
Password:
su: Authentication failure
[ec2-user@ip-172-31-24-69 ~]$ TechStart2025!
-bash: TechStart2025!: command not found
[ec2-user@ip-172-31-24-69 ~]$ su - teamlead
sudo whoami
Password:
su: Authentication failure
root
[ec2-user@ip-172-31-24-69 ~]$ sudo mkdir -p /opt/techstart/backend
sudo mkdir -p /opt/techstart/frontend
sudo mkdir -p /opt/techstart/devops
sudo mkdir -p /opt/techstart/shared
[ec2-user@ip-172-31-24-69 ~]$ sudo chown root:backend-dev /opt/techstart/backend
sudo chown root:frontend-dev /opt/techstart/frontend
sudo chown root:devops-team /opt/techstart/devops
sudo chown root:dev-all /opt/techstart/shared
[ec2-user@ip-172-31-24-69 ~]$ # Backend folder
sudo chmod 2770 /opt/techstart/backend

# Frontend folder
sudo chmod 2770 /opt/techstart/frontend

# DevOps folder
sudo chmod 2770 /opt/techstart/devops

# Shared folder (everyone in dev-all)
sudo chmod 2770 /opt/techstart/shared
[ec2-user@ip-172-31-24-69 ~]$ ls -ld /opt/techstart/*
drwxrws---. 2 root backend-dev  6 Oct  8 09:35 /opt/techstart/backend
drwxrws---. 2 root devops-team  6 Oct  8 09:35 /opt/techstart/devops
drwxrws---. 2 root frontend-dev 6 Oct  8 09:35 /opt/techstart/frontend
drwxrws---. 2 root dev-all      6 Oct  8 09:35 /opt/techstart/shared
[ec2-user@ip-172-31-24-69 ~]$ su - backend1
cd /opt/techstart/backend
touch testfile_backend.txt
Password:
[backend1@ip-172-31-24-69 ~]$ sudo getfacl /opt/techstart/shared
```

Part 5 – ACLs

Folder	User	Permissions
/opt/techstart/shared	backend1	rwx
/opt/techstart/shared	frontend1	rwx
/opt/techstart/shared	devops1	rwx

Part 6 – Sudo Privileges Test

Test	Expected Output
sudo whoami	root
sudo mkdir /opt/techstart/admin-test folder created	
ls -ld /opt/techstart/admin-test	shows folder exists

```
[teamlead@ip-172-31-24-69 ~]$ sudo whoami

We trust you have received the usual lecture from the local System
Administrator. It usually boils down to these three things:

    #1) Respect the privacy of others.
    #2) Think before you type.
    #3) With great power comes great responsibility.

For security reasons, the password you type will not be visible.

[sudo] password for teamlead:
root
```

Part 7 – File Creation & SGID Inheritance

Folder	User	File Created	Group Inherited
backend	backend1	testfile_backend.txt	backend-dev
frontend	frontend1	testfile_frontend.txt	frontend-dev
devops	devops1	testfile_devops.txt	devops-team
shared	backend1	sharedfile.txt	dev-all

```
[teamlead@ip-172-31-24-69 ~]$ sudo getfacl /opt/techstart/shared
getfacl: Removing leading '/' from absolute path names
# file: opt/techstart/shared
# owner: root
# group: dev-all
# flags: -s-
user::rwx
group::rwx
other::---

[teamlead@ip-172-31-24-69 ~]$ sudo setfacl -m u:backend1:rwx /opt/techstart/shared
sudo getfacl /opt/techstart/shared
getfacl: Removing leading '/' from absolute path names
# file: opt/techstart/shared
# owner: root
# group: dev-all
# flags: -s-
user::rwx
user:backend1:rwx
group::rwx
mask::rwx
other::---

[teamlead@ip-172-31-24-69 ~]$ sudo setfacl -m u:backend1:rwx /opt/techstart/shared
sudo setfacl -m u:frontend1:rwx /opt/techstart/shared
sudo setfacl -m u:devops1:rwx /opt/techstart/shared
[teamlead@ip-172-31-24-69 ~]$ sudo getfacl /opt/techstart/shared
getfacl: Removing leading '/' from absolute path names
# file: opt/techstart/shared
# owner: root
# group: dev-all
# flags: -s-
user::rwx
user:backend1:rwx
user:frontend1:rwx
user:devops1:rwx
group::rwx
mask::rwx
```

Part 8 – Backup & Clean Up

Backup File	Location
techstart_backup.tar.gz	/home/teamlead
EC2 Instance Status	Stopped
Optional: Disk Usage	df -h

```
[teamlead@ip-172-31-24-69 ~]$ su - backend1
cd /opt/techstart/shared
touch testfile_backend.txt
ls -l
Password:
Last login: Wed Oct  8 09:36:17 UTC 2025 on pts/0
[backend1@ip-172-31-24-69 ~]$ su - teamlead
Password:
Last login: Wed Oct  8 09:42:06 UTC 2025 on pts/0
[teamlead@ip-172-31-24-69 ~]$ sudo mkdir /opt/techstart/admin-test
[teamlead@ip-172-31-24-69 ~]$ ls -ld /opt/techstart/admin-test
drwxr-xr-x. 2 root root 6 Oct  8 09:45 /opt/techstart/admin-test
[teamlead@ip-172-31-24-69 ~]$ sudo nano /etc/hostname
[teamlead@ip-172-31-24-69 ~]$ cd /opt/techstart/backend
-bash: cd: /opt/techstart/backend: Permission denied
[teamlead@ip-172-31-24-69 ~]$ id backend1
uid=1001(backend1) gid=1001(backend-dev) groups=1001(backend-dev),1002(dev-all)
[teamlead@ip-172-31-24-69 ~]$ sudo chmod 2770 /opt/techstart/backend
sudo ls -ld /opt/techstart/backend
drwxrws---. 2 root backend-dev 6 Oct  8 09:35 /opt/techstart/backend
[teamlead@ip-172-31-24-69 ~]$ su - backend1
cd /opt/techstart/backend
Password:
Last login: Wed Oct  8 09:44:33 UTC 2025 on pts/0
[backend1@ip-172-31-24-69 ~]$ sudo shutdown -h now
[sudo] password for backend1:
backend1 is not in the sudoers file.
[backend1@ip-172-31-24-69 ~]$ exit
logout
-bash: cd: /opt/techstart/backend: Permission denied
[teamlead@ip-172-31-24-69 ~]$ exit
logout
[backend1@ip-172-31-24-69 ~]$ exit
logout
total 0
-rw-r--r--. 1 teamlead dev-all 0 Oct  8 09:51 testfile_backend.txt
[teamlead@ip-172-31-24-69 shared]$ exit
logout
[ec2-user@ip-172-31-24-69 ~]$ sudo shutdown -h now

Broadcast message from root@localhost on pts/1 (Wed 2025-10-08 09:52:00 UTC):

The system will power off now!

[ec2-user@ip-172-31-24-69 ~]$
```

i-04474e0a16e1898c7 (Group 14)
PublicIPs: 13.62.127.219 PrivateIPs: 172.31.24.69