1- Configure the network:

a- Assign Hostname and Ip address for your virtual machine.

Hostname serverb.lab.example.com

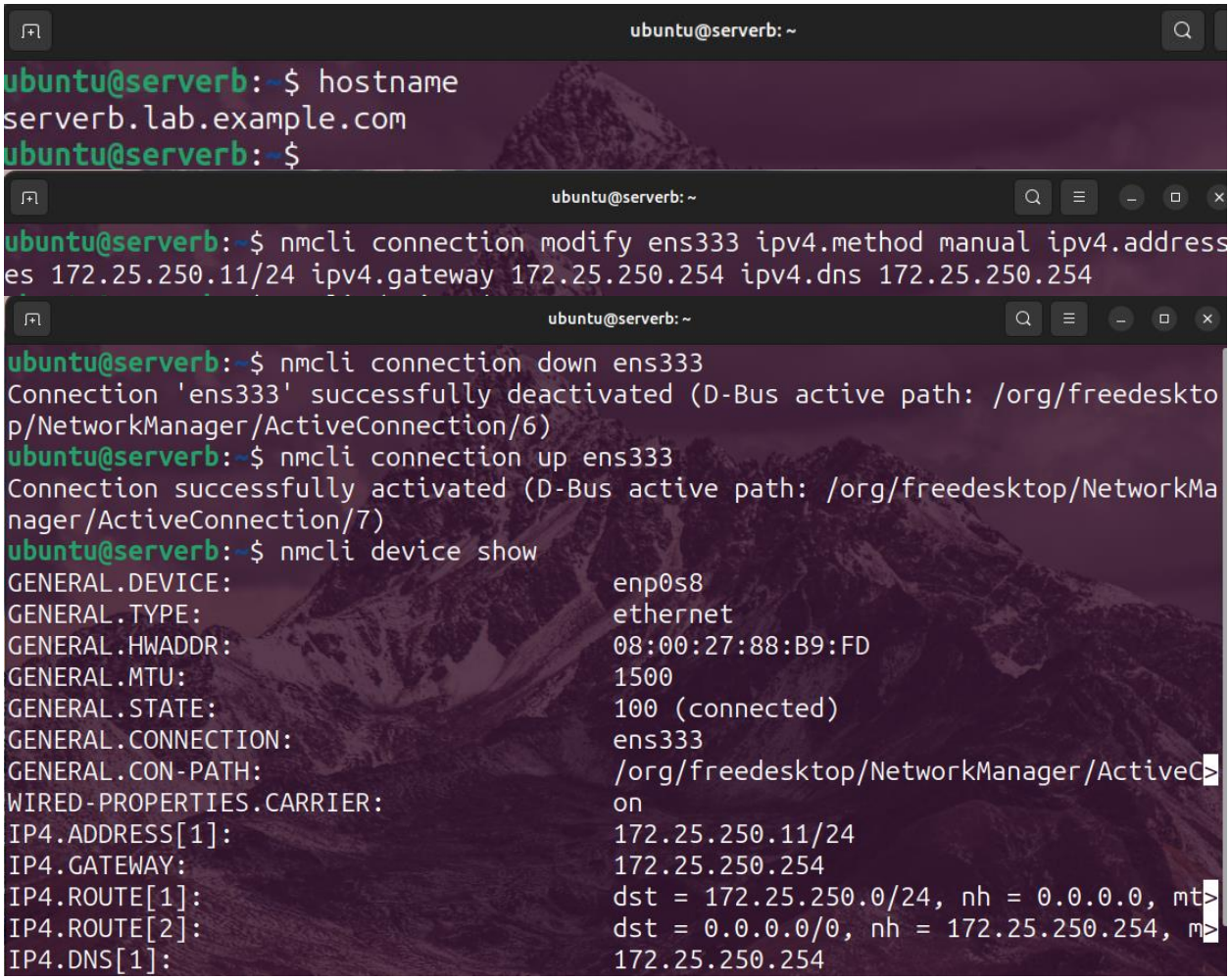
IP Address 172.25.250.11

Netmask 255.255.255.0

Gateway 172.25.250.254

Nameserver 172.25.250.254

>> sudo hostnamectl hostname serverb.lab.example.com



2- Create the following users, groups and group memberships

a- A group named admin.

b- A user harry who belongs to admin as a secondary group

```
ubuntu@ubuntu:~$ sudo usermod -aG admin harry
```

```
harry@ubuntu:/home/ubuntu$ id
uid=1005(harry) gid=1007(harry) groups=1007(harry),1006(admin)
harry@ubuntu:/home/ubuntu$
```

c- A user natasha who belongs to admin as a secondary group

```
ubuntu@ubuntu: $ sudo useradd natasha
ubuntu@ubuntu: $ sudo usermod -aG admin natasha
ubuntu@ubuntu: $ groups natasha
natasha : natasha admin
ubuntu@ubuntu: $
```

d- A user sarah who does not have access to an interactive shell on the system and who is not member of admin

```
ubuntu@ubuntu:~$ sudo useradd -s /bin/nologin sarah
useradd: Warning: missing or non-executable shell '/bin/nologin'
useradd: user 'sarah' already exists
ubuntu@ubuntu:~$ sudo tail /etc/passwd
vboxadd:x:999:1::/var/run/vboxadd:/bin/false
ibrahim:x:1001:1001::/home/ibrahim:/bin/sh
salma:x:1002:1002::/home/salma:/bin/sh
postfix:x:125:130::/var/spool/postfix:/usr/sbin/nologin
mysql:x:126:133:MySQL Server,,,:/nonexistent:/bin/false
Ansible:x:1003:1003:Ansible_controller:/home/Ansible:/bin/bash
oracle:x:1004:1004::/home/oracle:/bin/sh
harry:x:1005:1007::/home/harry:/bin/bash
natasha:x:1006:1008::/home/natasha:/bin/sh
sarah:x:1007:1009::/home/sarah:/bin/nologin
ubuntu@ubuntu:~$ _
```

e- harry, natasha and sarah should have password of password

```
ubuntu@ubuntu: $ sudo passwd natasha
New password:
BAD PASSWORD: The password fails the dictionary check - it is based on a dictionary word
Retype new password:
passwd: password updated successfully
ubuntu@ubuntu:~$ sudo passwd sarah
New password:
BAD PASSWORD: The password fails the dictionary check - it is based on a dictionary word
Retype new password:
passwd: password updated successfully
ubuntu@ubuntu:~$ sudo passwd harry
New password:
BAD PASSWORD: The password fails the dictionary check - it is based on a dictionary word
Retype new password:
passwd: password updated successfully
ubuntu@ubuntu:~$
```

3- Create a collaborative directory /common/admin with the following characteristics

a- Group ownership of /common/admin is admin

```
ubuntu@ubuntu:~$ sudo mkdir -p  /common/admin
ubuntu@ubuntu:~$ ls -ld /common/admin
drwxr-xr-x 2 root root 4096 Oct 19 12:33 /common/admin
ubuntu@ubuntu:~$ sudo chown :admin /common/admin/
ubuntu@ubuntu:~$ ls -ld /common/admin/
drwxr-xr-x 2 root admin 4096 Oct 19 12:33 /common/admin/
ubuntu@ubuntu:~$
```

b- The directory should be readable,writable and accessible to members of admin, but not toany other user.

```
ubuntu@ubuntu: ~
ubuntu@ubuntu: $ sudo chmod 770 /common/admin
ubuntu@ubuntu: $ ls -ld /common/admin/
drwxrwx--- 2 root admin 4096 Oct 19 12:33 /common/admin/
ubuntu@ubuntu:~$
```

c- Files created in /common/admin automatically have group ownership set to the admin group

```
ubuntu@ubuntu:~$ sudo chmod 770 /common/admin
ubuntu@ubuntu:~$ ls -ld /common/admin/
drwxrwx--- 2 root admin 4096 Oct 19 12:33 /common/admin/
ubuntu@ubuntu:~$ sudo chmod g+s /common/admin/
ubuntu@ubuntu:~$ ls -ld /common/admin/
drwxrws--- 2 root admin 4096 Oct 19 12:33 /common/admin/
ubuntu@ubuntu:~$ _
```

4- The user harry must configure cron job that runs daily at 12:30 local time and execute/bin/echo "hello".

```
ubuntu@ubuntu:~$ sudo su - harry
su: warning: cannot change directory to /home/harry: No such file or directory
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

harry@ubuntu:/home/ubuntu$ crontab -e
no crontab for harry - using an empty one
touch: cannot touch '/home/harry/.selected_editor': No such file or directory
Unable to create directory /home/harry/.local/share/nano/: No such file or directory
It is required for saving/loading search history or cursor positions.

No modification made
harry@ubuntu:/home/ubuntu$
harry@ubuntu:/home/ubuntu$ crontab -e
# m h  dom mon dow   command
30 12 * * * /bin/echo "hello"
File Name to Write: /tmp/crontab.i1Lg3t/crontab
^G Help          M-D DOS Format      M-A Append          M-B Backup File
```

>>save and exit then verify as below

>> crontab -l

```
# m h  dom mon dow   command
30 12 * * * /bin/echo "hello"
harry@ubuntu:/home/ubuntu$ _
```

5- Configure your system so that it is an NTP client of classroom.example.com

>> install NTP

```
ubuntu@ubuntu:~$ sudo apt update
Hit:1 http://in.archive.ubuntu.com/ubuntu lunar InRelease
Hit:2 https://apt.releases.hashicorp.com jammy InRelease
Hit:3 http://in.archive.ubuntu.com/ubuntu lunar-updates InRelease
Hit:4 https://download.docker.com/linux/ubuntu lunar InRelease
Hit:5 http://in.archive.ubuntu.com/ubuntu lunar-backports InRelease
Hit:6 https://ppa.launchpadcontent.net/ansible/ansible/ubuntu lunar InRelease
Hit:7 http://in.archive.ubuntu.com/ubuntu lunar-security InRelease
Hit:8 https://ftp.postgresql.org/pub/pgadmin/pgadmin4/apt/jammy pgadmin4 InRelease
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
2 packages can be upgraded. Run 'apt list --upgradable' to see them.
ubuntu@ubuntu:~$ sudo apt install -y ntp
```

>> modify the config file of the NTP

```
ubuntu@ubuntu: ~
  GNU nano 7.2                                  /etc/ntp.conf *
server classroom.example.com iburst
```

>>save and exit

>>then restart the ntp service

```
ubuntu@ubuntu: ~
ubuntu@ubuntu:~$ sudo systemctl restart  n
Failed to restart n.service: Unit n.service not found.
ubuntu@ubuntu:~$ sudo systemctl restart  ntp
ubuntu@ubuntu:~$ _
```

>>verify that it works property

```
ubuntu@ubuntu:~$ sudo systemctl status  ntp
● ntpsec.service - Network Time Service
     Loaded: loaded (/lib/systemd/system/ntpsec.service; enabled; preset: enabled)
     Active: active (running) since Sat 2024-10-19 13:14:40 EDT; 1min 9s ago
       Docs: man:ntpd(8)
    Process: 11970 ExecStart=/usr/libexec/ntpsec/ntp-systemd-wrapper (code=exited, status=0/SUCCESS)
   Main PID: 11974 (ntpd)
      Tasks: 1 (limit: 9426)
     Memory: 10.6M
        CPU: 98ms
```

>>verify the synchronization

```
ubuntu@ubuntu:~$ ntpq -p
     remote           refid      st t when poll reach   delay   offset   jitter
==============================================================================
 0.ubuntu.pool.ntp.org .POOL.          16 p    -  256    0    0.0000   0.0000   0.0001
 1.ubuntu.pool.ntp.org .POOL.          16 p    -  256    0    0.0000   0.0000   0.0001
 2.ubuntu.pool.ntp.org .POOL.          16 p    -  256    0    0.0000   0.0000   0.0001
 3.ubuntu.pool.ntp.org .POOL.          16 p    -  256    0    0.0000   0.0000   0.0001
 alphyn.canonical.com  .DNS4.          16 u    -   64    0    0.0000   0.0000   0.0001
 za-jnb-rs01b.dpogroup.com .INIT.      16 u    -   64    0    0.0000   0.0000   0.0001
 ns2.ipb.na            .INIT.          16 u    -   64    0    0.0000   0.0000   0.0001
 za-ctn-rs01a.dpogroup.com .INIT.      16 u    -   64    0    0.0000   0.0000   0.0001
```

6- Locate all the files owned by sarah and make a copy of them in the given path /root/find.user

>> create the directory to store in it

```
ubuntu@ubuntu:~$ sudo mkdir -p /root/find.user
ubuntu@ubuntu:~$ ls -ld/root/find.user
ls: invalid option -- '/'
Try 'ls --help' for more information.
ubuntu@ubuntu:~$ ls -ld /root/find.user
ls: cannot access '/root/find.user': Permission denied
ubuntu@ubuntu:~$ sudo ls -ld /root/find.user
drwxr-xr-x 2 root root 4096 Oct 19 13:20 /root/find.user
ubuntu@ubuntu:~$ _
```

>> find all files owned by sarah and store it in the directory

```
ubuntu@ubuntu: $ sudo find / -user sarah -exec cp --parents {} /root/find.user/ \;
^Z
[1]+  Stopped                 sudo find / -user sarah -exec cp --parents {} /root/find.user/ \;
ubuntu@ubuntu: $ bg %1
[1]+ sudo find / -user sarah -exec cp --parents {} /root/find.user/ \; &
ubuntu@ubuntu: $ jobs
[1]+  Running                 sudo find / -user sarah -exec cp --parents {} /root/find.user/ \; &
ubuntu@ubuntu: $
```

Note that : I sent this job to the background as it will take a long time running

>> after completion we can verify that all files have been stored in the directory by “sudo ls –R /root/find.user”

7- Find a string "home" in /etc/passwd and searching string as been stored in /root/search.txt

```
root@ubuntu:~# grep "home" /etc/passwd > /root/search.txt
root@ubuntu:~# cat search.txt
ubuntu:x:1000:1000:Ubuntu:/home/ubuntu:/bin/bash
ibrahim:x:1001:1001::/home/ibrahim:/bin/sh
salma:x:1002:1002::/home/salma:/bin/sh
Ansible:x:1003:1003:Ansible_controller:/home/Ansible:/bin/bash
oracle:x:1004:1004::/home/oracle:/bin/sh
harry:x:1005:1007::/home/harry:/bin/bash
natasha:x:1006:1008::/home/natasha:/bin/sh
sarah:x:1007:1009::/home/sarah:/bin/nologin
root@ubuntu:~# _
```

8- Create an user account with Userid 1326 and user name as alies

```
ubuntu@ubuntu:~$ sudo useradd -u 1326 alies
ubuntu@ubuntu:~$ sudo tail -n 3 /etc/passwd
sarah:x:1007:1009::/home/sarah:/bin/nologin
ntpsec:x:127:134::/nonexistent:/usr/sbin/nologin
alies:x:1326:1326::/home/alies:/bin/sh
ubuntu@ubuntu:~$ _
```

9- Backup the /var/tmp as /root/test.tar.gz

```
root@ubuntu:~# tar -czvf test.tar.gz /var/tmp

tar: Removing leading `/' from member names
/var/tmp/
/var/tmp/systemd-private-8011bfdda5d24ffea49fed59faf6a0ef-ModemManager.service-D3eaOI/
/var/tmp/systemd-private-8011bfdda5d24ffea49fed59faf6a0ef-ModemManager.service-D3eaOI/tmp/
/var/tmp/systemd-private-8011bfdda5d24ffea49fed59faf6a0ef-systemd-oomd.service-OuT8aB/
/var/tmp/systemd-private-8011bfdda5d24ffea49fed59faf6a0ef-systemd-oomd.service-OuT8aB/tmp/
/var/tmp/systemd-private-8011bfdda5d24ffea49fed59faf6a0ef-switcheroo-control.service-Xd8ihw/
/var/tmp/systemd-private-8011bfdda5d24ffea49fed59faf6a0ef-switcheroo-control.service-Xd8ihw/tmp/
/var/tmp/systemd-private-8011bfdda5d24ffea49fed59faf6a0ef-colord.service-HrJNAS/
root@ubuntu:~# ls -l test.tar.gz
-rw-r--r-- 1 root root 622 Oct 19 13:40 test.tar.gz
```

10- Set the Permission

a- All new creating files for user natasha as -r-------- as default permission

>> su – natasha

>> sudo nano /.bashrc

```
umask 266
```

>>save and exit

>>source the file to apply the changes then try to create a new file and test the permissions

```
natasha@ubuntu:~$ source .bashrc
natasha@ubuntu:~$ touch tea
natasha@ubuntu:~$ ls -l tea
-r-------- 1 natasha natasha 0 Oct 19 13:58 tea
```

b- All new creating directories for user natasha as dr-x------ as default permission

>> sudo nano .bashrc

```
umask 277
```

>>save and exit

>>source the file to apply the changes then try to create a new dir and test the permissions

```
natasha@ubuntu:~$ source .bashrc
natasha@ubuntu:~$ mkdir sugar
natasha@ubuntu:~$ ls -ld sugar
dr-x------ 2 natasha natasha 4096 Oct 19 14:03 sugar
natasha@ubuntu:~$ _
```

11- The password for all new users in serverb.lab.example.com should expires after 20 days

>> sudo nano /etc/login.defs

```
#
PASS_MAX_DAYS   20
PASS_MIN_DAYS   0
PASS_WARN_AGE   7
```

>> save and exit

>> create a new user and test the changes

```
ubuntu@ubuntu:~$ sudo useradd testuser
ubuntu@ubuntu:~$ sudo chage -l testuser
Last password change                                    : Oct 19, 2024
Password expires                                        : Nov 08, 2024
Password inactive                                       : never
Account expires                                         : never
Minimum number of days between password change          : 0
Maximum number of days between password change          : 20
Number of days of warning before password expires       : 7
ubuntu@ubuntu:~$
```

12- Assign the Sudo Privilege for Group "admin" and Group members can administrate withoutany password.

>> sudo visudo

```
# Members of the admin group may gain root privileges
%admin ALL=(ALL) ALL

# Allow members of group sudo to execute any command
%admin ALL=(ALL) NOPASSWD: ALL

%sudo   ALL=(ALL:ALL) NOPASSWD:ALL
```

>> save and exit and try to execute a command with sudo privillage

```
natasha@ubuntu:~$ sudo ls /root
find.user  search.txt  snap  test.tar.gz
natasha@ubuntu:~$
```

13-

>> sudo nano .bashrc

```
fi
alias RHCSA='echo "Welcome to Advantage Pro"'
File Name to Write: .bashrc
```

>> save and exit

>> source the file and apply the changes

```
alies@ubuntu:~$ source .bashrc
alies@ubuntu:~$ RHCSA
Welcome to Advantage Pro
alies@ubuntu:~$ _
```

>> if you mean that when the user alies try to log in the terminal display the welcome message

So you will follow the above steps:

- write the welcome message in the .bashrc file of alies user then save and exit finally source the file

```
# for examples
echo "Welcome to Advantage Pro"
# If not running interactively, don't do anything
case $- in
```

- sign out and then try to sign in with the alies user again you will have a welcome message

```
ubuntu@ubuntu:~$ sudo su - alies
Welcome to Advantage Pro
alies@ubuntu:~$ _
```