

# LINUX - day 1

scp -r root@172.22.55.99:/tmp\*. for all

scp root@172.22.55.99:/tmp/<file \_name> . for single file

Hostnamectl set-hostname client → to change the host name

Exec bash → for quick update

**-22 sep 2025**

**for Acces to server**

user120

pass = A@dmin@2024

RDP

172.22.53.205

User120

Admin@2k25

Putty

srv = 172.22.55.59

client = 172.22.55.60

root

Root@2k25

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Website for Linux and windows :

[www.server-world.info/en](http://www.server-world.info/en)

1. LTIMIndtree B1.3 --- LTIM-bbsr-B1.3
2. url -- <https://github.com/iamjeetusingh>

UNIX 1 JAN 1970 LINUX 17 SEP 1991

THE UNIX DISTRUBUTIONS /DISTROS { MOSTLY N USE }

1. AIX by IBM
2. HP-UX by Hewleet-Packard Company
3. Solaris by SUn Microsystem [Oracle ]
4. Mac -os

EASY TO INSTALL APPLICATION

\\\ WHY ??

1. PACKAGE MANAGER { PACKage mean s/w in wind}

- INSTALL

- REMOVE

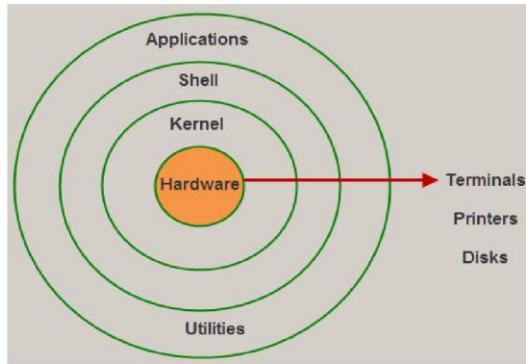
- UPDATE

- QUERET

like --- ( A--> B)

SE ( Security Enhance ) in Linux make it more secure

## Linux Architecture



Shell is used to validate the command first then then terminate it

Shell send s the binary commands to the kernal and kernal send it to the h/w

In case of terminal it only run the validate command if it is present the it will be executed only otherwise not

**Which are the 7 types of file in linux ??**

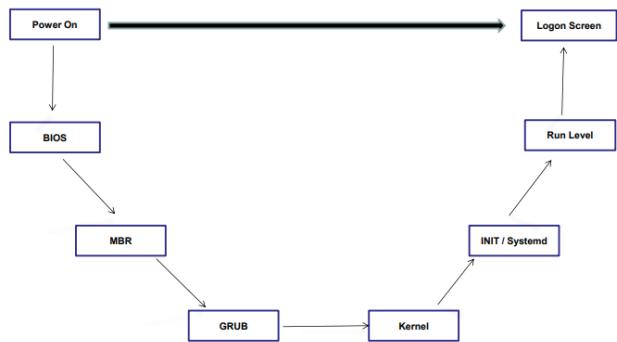
**Linux principle --**

- 1. Everything is a file. ( Including hardware )**
- 2. Small , single purpose program**
- 1.Because it contains the modules for every specific code**
- 3. Ability to chain programs together to perform complex tasks.**
- 4. Avoid captive user interfaces**
- 5. Configuration data stored in text**

In linux /etc everything is present like in window the downloaded files present in c/program files

## BOOTING PROCESS IN LINUX

### Booting process in LINUX



Power on

|

**BIOS = Basic Input Output System**

It perform POST

P—Power

O- On

S-Self

T-Test

|

**MBR = Master Boot Record**

It hold the address of OS

**Size of MBR = 512 Bytes**

|

**GRUB = Grand Unified Bootloader**

**It lists all the OS in System**

**It can help in Troubleshooting**

|

**Kernal = It loads OS from HDD to RAM**

**It modifies start the 1<sup>st</sup> linux process (Linux /Systemd)**

|

**INIT/Systemd = INIT -old OS -- Central 5,6**

**Systemd – new os – centos 7,8,9,10**

|

**Runlevel = it's the mode in which you want to start the os**

**7 mode ‘**

**Old Runlevel =**

```
init0    - halt/shutdown      - runlevel0.target - poweroff.target
Init1    - single user maint . mode
Init2    - multi user maint . mode
Init3    - fully function CTI mode
Init4    - unused till date.
Init5    - init 3 + GUI – graphical.target
Init6    -reboot
```

Old runlevel	RedHat 7 `systemd` unit
init0	poweroff.target
init1	rescue.target
init2	multi-user.target
init3	multi-user.target
init4	multi-user.target
init5	graphical.target
init6	reboot.target

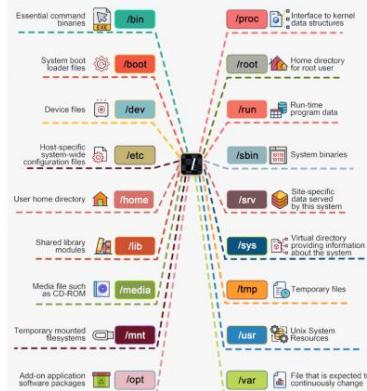
|

**Login screen = Once the runlevel is selected its goes for a login page ,**

**Here you type username and pwd**

**File system Hierarchy Standard (FHS)**

## File system Hierarchy Standard (FHS)



/ ( slash ,forward slash , root )

- =       **/bin** -- command binaries of regular user are stored here -ping
- =       **/sbin** -- commands binaries of root user are stored here -useradd
- =       **/home** -- home directory of regular user . Aniket -> /home/Aniket
- =       **/root** – home directory of Root user.
- =       **/etc** – it contains all configuration data in it that's why its most import directory in it
- =       **/var** – contains all the LOG files in it . (/var/log).
- =       **/boot** – contains bootable files in it .
- =       **/usr** – contains user intalled applications in it .
- =       **/dev** – contains device related files in it .
- =       **/mnt** - it mounts all the temporary devices . like pendive ATTACHED .

### PRESENT HERE

- =       **/run** – similar to /mnt but used in all new systems.
- =       **/tmp** – contains temporary files in it .
- =       **/proc** – contains all the running processes in it .
- =       **/lib** – library for developer (32 bit)
  - **/libx64** - library for developer (64 bit).

**Echo \$SHELL**

{ echo is for printing something })

**Cat/etc/shells**

**Cat/etc/shells | WC -l** -> to count the number of shells present in the system

**Vim/etc/Config-files**

**Cat/etc/**

**\$ --- regular user**

**#---- root user**

**Userdel -r {username }**

**Passwd –{change password}**

~

**Whoami**

**Hostname**

**Pwd**

**Su - hulk ( switch user)**

- Change it to home directory otherwise it in root directory

**History -- for show all commands**

**grep is for filter**

**Clear to clear the command**

**Ctrl + L - for fresh window but data is available on top**

**TASK :**

**1. Difference between INIT and SYSTEMD**

**2. Installation of CentOS 9.**

**3. Types of files in linux.**

**4. Types of file editor in linux:**

- a. Touch
- b. Cat
- c. Nano
- d. Gedit
- e. Vim / vi

**5. Booting process .**

**1. Difference Between INIT and SYSTEMD**

Feature	init (SysVinit)	systemd
Startup Speed	Sequential (slower)	Parallel (faster boot)
Configuration	Shell scripts (/etc/init.d)	Unit files (/etc/systemd/system)
Service Management	Basic start/stop/restart	Advanced (dependencies, timers, etc.)
Logging	/var/log/messages	journald (binary logs)
Adoption	Older systems (e.g., RHEL 6)	Modern systems (e.g., RHEL 7+)

**2. Installation of CentOS 9**

CentOS 9 Stream is the rolling-release version of RHEL 9. Here's a high-level installation process:

1. Download ISO: From CentOS Stream official site.
2. Create Bootable USB: Use tools like Rufus (Windows) or dd (Linux).

### 3. Boot from USB: Set USB as the first boot device in BIOS.

#### 4. Install Process:

- Choose language and keyboard layout.
- Set installation destination (disk).
- Configure network and hostname.
- Set root password and create user.
- Begin installation.

#### 5. Post-Install:

- Reboot and remove USB.
- Login and update system: `sudo dnf update`

---

#### 3. Types of Files in Linux

Linux treats everything as a file. Types include:

1. Regular files – Text, images, binaries, etc.
2. Directory files – Folders.
3. Special files:
  - Block devices (e.g., hard drives)
  - Character devices (e.g., keyboards)
4. Named pipes (FIFO) – For inter-process communication.
5. Sockets – For network communication.
6. Symbolic links – Shortcuts to other files.

---

#### 4. Types of File Editors in Linux

Editor	Description
touch	Not an editor, but creates empty files: <code>touch file.txt</code>
cat	Displays or creates files: <code>cat &gt; file.txt</code>
Nano	Simple terminal-based editor. Easy to use.
gedit	GUI-based editor for GNOME.
vim/vi	Powerful terminal-based editor. Steeper learning curve but very efficient.

---

#### 5. Booting Process in Linux (Systemd-based)

1. BIOS/UEFI – Initializes hardware.
2. Bootloader (GRUB) – Loads the kernel.
3. Kernel – Initializes system and mounts root filesystem.
4. init/systemd – PID 1 process starts.

5. Target Units – Systemd loads services (e.g., multi-user.target).
  6. Login – User gets login prompt or GUI.
- 

Runlevel - prev as well current mode like N 5 like 5 for GUI

Systemctl get-default - working mode

Systemctl set-default multi-user.target : init 5 - permanent change

Init 4 - temporary change

: - it uses for run multiple cmd

File mgmt.

- Create
  - 1. Touch
    - create a blank file , if it does not exists.
    - if file exists , then it will update the time stamp .

## 2. Cat

- It helps in viewing a files content .  
`#cat filename .txt`  
-it helps in viewing

## 3. Nano

i.

### 4. Gedit

### 5. Vi/vim

- Modify
- Delete
- Copy
- Move
- Hide
- unhide
- rename

## directory mgmt.

- create
  - o `mkdir directoryname`
- change
  - o `cd` // take you to the users home directory
  - o `cd..` //take you the parent directory
  - o `cd~` // take you to the users home directory
  - o `cd-` // take you to the last known location
- delete
  - o `rmdir directoryname` //delets only empty directory
  - o `rm -rf directoryname` //deletes file or directories

```
mkdir ltib5.3
cd ltib5.3
ls
ls -l
touch touchfile.txt
ls
ls -l
date
ls -l
```

In **Linux**, files are categorized not just by their extensions (like in Windows), but more importantly by their **type** as recognized by the system. You can check a file's type using the file command. Here are the **main types of files in Linux**:

---

#### ◆ 1. Regular Files

- **Text files:** Source code, configuration files, logs, etc.
- **Binary files:** Compiled programs, images, videos, etc.

- Identified by - in the first character of ls -l output.
- 

◆ **2. Directory Files**

- Folders that contain other files or directories.
  - Identified by d in ls -l.
- 

◆ **3. Symbolic Links (Symlinks)**

- Pointers or shortcuts to other files or directories.
  - Identified by l in ls -l.
- 

◆ **4. Character Device Files**

- Represent devices that handle data character by character (e.g., keyboard, serial ports).
  - Found in /dev, identified by c in ls -l.
- 

◆ **5. Block Device Files**

- Represent devices that handle data in blocks (e.g., hard drives, USB drives).
  - Also in /dev, identified by b.
- 

◆ **6. Socket Files**

- Used for inter-process communication (IPC).
  - Identified by s.
- 

◆ **7. Named Pipes (FIFOs)**

- Another form of IPC, allowing data to flow in one direction.
  - Identified by p.
- 

◆ **8. Executable Files**

- Regular files with execute permissions (chmod +x).
  - Can be scripts (e.g., .sh, .py) or compiled binaries.
- 

◆ **9. Hidden Files**

- Any file or directory starting with a dot (.), like .bashrc.
- Not a different type, but hidden from normal ls output unless you use ls -a.

DAY 2

STORAGE MANAGEMENT

STANDARD PARTITIONING

-Adding single disk in linux and using it.

-it provides fixed disk.

### LVM (Logical Volume Manager ) partitioning

-Dynamic disk

-Its size can vary

-it provides dynamic disk where disk size can be increased or decreased

### RAID

- redundant array of independent disk UNNECESSARY SPACE

- required identical disk like one is of 10 gb then another one is must be 10gb

-it requires identical disk to work .

-Raid Types :-

1. RAID 0 -Stripping

-minimum 2 identical disk required

Split into two disk

One disk carrepted whole data is useless

2. RAID 1 -Mirroring

- minimum 2 identical disk required

- use only 50% of data

- like buy 20GB but split into 2 disk each of 10GB  
for mirroring the data that is copying the data

3. RAID 5 -Striping with single parity --minimum 3 identical disk required

Stored a and b in c =a+b

Problem when 2 fail

- 4. RAID 6
  - Striping with dual parity
  - minimum 4 identical disk required

- 5. RAID 10 -Mirroring with Stripping

### Commands:

-to list all attached disk

```
# lsblk
```

-to list all the mounted partitions

```
# df -h
```

```
#df -hT { hT – human readable Type}
```

-to create partition

```
# fdisk <disk_name>
```

-to create file system

```
#mkfs.<fs>
```

-to mount and unmount a partitions

```
#mount //it mounts the partitions
```

```
#umount //it removes / unmount the partitions
```

### **File system in windows :**

**NTFS (new technology file system )**

**FAT /FAT16 (file allocation table )**

**FAT32 (file allocation table )**

**ReFS (Resilient File System)**

### **FILE system in linux :**

**EXT**

**EXT2**

**EXT3**

**EXT4**

**XFS (default file system )**

**BtrFs**

**CramFs**

**exFAT**

### **Steps to create standard partition:**

**-add a disk to linux system**

**-create a partition using fdisk utility**

**-create a file system for this partition using mkfs command**

**-create a mount point using mkdir cmd.**

- mount the partition using **mound** cmd. And verify

TO CHANGE THE COMPUTER NAME :

1. # Hostnamectl set-hostname server
2. # Hostnamectl set-hostname client

OR

3. # nmtui //network manager text user interface
4. # nmcli //network manager command line interface  
(older one)

## MBR vs GPT

---

Mbr : ( Master Boot Loader )

-4 primary partition

- 2TB HDD support only

GPT:

-GUID partition table

-GUID -Globbal Unique Identifier

-128 primary partitions

-18 Exabytes HDD supports

### To delete the standard partition

-unmount the mounted partititon using umount cmd

-delete the directory (/standard)

-delete the file system using fdisk utility → d,w

#lsblk try it works or not

### DAY 3

24 SEP 2025

Task :

- Create a standard partition of 7GB using EXT4 file system and mount it at /std5.3

```
[root@lin-server ~]# lsblk
NAME      MAJ:MIN RM  SIZE RO TYPE MOUNTPOINTS
sda        8:0    0   60G  0 disk
└─sda1     8:1    0    2G  0 part /boot
└─sda2     8:2    0    1G  0 part /boot/efi
└─sda3     8:3    0   44G  0 part
  ├─cs-root 253:0  0   10G  0 lvm  /
  ├─cs-swap 253:1  0    4G  0 lvm  [SWAP]
  ├─cs-tmp  253:2  0    5G  0 lvm  /tmp
  ├─cs-var  253:3  0   20G  0 lvm  /var
  └─cs-home 253:4  0    5G  0 lvm  /home
sdb        8:16   0   30G  0 disk
└─sdb1     8:17   0    7G  0 part /std5.3
sdc        8:32   0   30G  0 disk
sr0       11:0    1 1024M 0 rom
[root@lin-server ~]#
```

## LVM

---

- Logical volume manager
- It helps in combining multiple disks together
- Storage disks can be on same or different sizes

### Steps to create LVM :

---

- Add the disk
- Create partition -fdisk
- Create a physical volume ( PV )
  - pvcreate
  - Pvdisplay
  - Pvs
  - pvremove
- Create volume group ( VG )

- Vgcreate
- Vgdisplay
- Vds
- Vgremove
- vgextend
- Create logical volume ( LV )
  - Lvcreate
  - Lvremove
  - Lvdisplay
- Create file system
  - mkdir
- Create mount point
  - Mount
  - umount
- Mount and verify

```
41  lsblk
42  df -hT
43  fdisk /dev/sdb
44  mkfs.ext4 /dev/sdb1
45  mkdir /std5.3
46  mount /dev/sdb /std5.3
47  mount /dev/sdb /std5.3/
48  mount /dev/sdb1 /std5.3/
49  lsblk
50  df -hT
51  umount /std5.3
52  rm -rf /std5.3
53  fdisk /dev/sdb
54  lsblk
55  history
```

```
root@lin-server:~# history
1  ifconfig
2  yum update
3  yum upgrade
4  passwd root
5  df -h
6  yum install vsftpd
7  mkdir /mnt
8  ls
9  cd /
10 ls
11 reboot
12 df -h
13 dmesg | grep sr0dmesg | grep sr0
14 mkdir -p /mnt/iso
15 mount /dev/sr0 /mnt/iso
16 df -h
17 xsudo chmod -R 755 /var/ftp/pub
18 sudo chmod -R 755 /var/ftp/pub
19 sudo cp -r /mnt/iso/. /var/ftp/pub/
20 cd /var/ftp/
21 cd pub/
22 ls
23 df -h
24 systemctl status vsftpd
25 systemctl status vsftpd
26 systemctl start vsftpd
27 systemctl enable vsftpd
```

Activate Windows  
Go to Settings to activate Windows.

```
root@lin-server:~#  
28 systemctl status vsftpd  
29 ls  
30 systemctl enable vsftpd  
31 cd  
32 clear  
33 systemctl status vsftpd  
34 cd /var/ftp/pub/  
35 ls  
36 date  
37 ifconfig  
38 df -h  
39 lsdsk  
40 lsdik  
41 lsblk  
42 df -hT  
43 fdisk /dev/sdb  
44 mkfs.ext4 /dev/sdb1  
45 mkdir /std5.3  
46 mount /dev/sdb /std5.3  
47 mount /dev/sdb /std5.3/  
48 mount /dev/sdb1 /std5.3/  
49 lsblk  
50 df -hT  
51 umount /std5.3  
52 rm -rf /std5.3  
53 fdisk /dev/sdb  
54 lsblk  
55 history  
56 lsblk  
57 df -hT
```

```
root@lin-server:~  
58  fdisk /dev/sdb  
59  lsblk  
60  mkfs.ext4 /dev/sdb1  
61  mkdir /std5.3  
62  mount /dev/sdb1 /std5.3/  
63  lsblk  
64  fdisk dev/sdb  
65  fdisk /dev/sdb  
66  lsblk  
67  fdisk /dev/sdb  
68  fdisk /dev/sdc  
69  lsblk /dev/sdb /dev/sdc  
70  fdisk dev/sdc  
71  p  
72  fdisk dev/sdc  
73  fdisk /dev/sdc  
74  lsblk /dev/sdb /dev/sdc  
75  pvs  
76  pvcreate /dev/sdb2 /dev/sdc1  
77  pvs  
78  vgs  
79  vgcreate vg /dev/sdb2 /dev/sdc1  
80  vgcreate vg /dev/sdb2 /dev/sdc1  
81  vgs  
82  lvs  
83  vgs  
84  lvcreate -n lg -l 50%FREE vg  
85  lgs  
86  lvs  
87  vgs
```

```
root@lin-server:~  
88  lvcreate -n lg -L +8G bg  
89* lvcreate -n lg -L +8G v  
90  lvcreate -n lg1 -L +8G vg  
91  lvs  
92  vgs  
93  lvs  
94  vgs  
95  lvcreate -n lg1 -l +8G vg  
96  lvs  
97  lvcreate -n lg1 -l 100%FREE  vg  
98  lvcreate -n lg2 -l 100%FREE  vg  
99  lgs  
100 lvs  
101 vgs  
102 lvdisplay  
103 mkfs.ext4 /dev/vg/lv  
104 mkfs.ext4 /dev/vg/lv1  
105 mkfs.ext4 /dev/vg/lv2  
106 mkfs.ext4 /dev/vg/lv  
107 mkfs.ext4 /dev/vg/lg2  
108 mkdir /lvm  
109 mount /dev/vg/lv /lvm  
110 mount /dev/vg/lg /lvm  
111 mount /dev/vg/lv  
112 mount /dev/vg/lv /lvm  
113 mount /dev/vg/lg2 /lvm  
114 df -hT  
115 lsblk  
116 history  
[root@lin-server ~]# df -hT
```

---

#### TASK:

---

Create new logical volume using the following

-total size:20GB

-1<sup>st</sup> LV length : 9GB with EXT4 and mount it on /ltlv01

-2<sup>nd</sup> LV length : 5GB with XFS and mount it on /ltlv02

Note : DO not use “rm” command anywhere in this task

root@lin-server:~

```
46 lsblk
47 history | tail -10
48 mkfs.ext4 /dev/sdc1
49 lsblk
50 fdisk /dev/sdc
51 lsblk
52 fdisk /dev/sdc
53 pvs
54 fdisk /dev/sdc
55 pvs
56 pvcreate /dev/sdc1 /dev/sdc2
57 vgcreate vg /dev/sdc1 dev/sdc2
58 vgcreate vg /dev/sdc1 /dev/sdc2
59 pvcreate /dev/sdc2
60 lsblk
61 vgcreate vg /dev/sdc1
62 lvcreate -n lv -L +9G vg
63 lvcreate -n lvl -L +5G vg
64 lsblk
65 mkfs.ext4 /dev/vg/lv
66 mkdir ltilv01
67 mount /dev/vg/lv /ltilv01
68 mount /dev/vg/lv /ltilv01/
69 mount /dev/vg/lv /ltilv01
70 lsblk
71 mkdir ltilv01
72 mount /dev/vg/lv /ltilv01
73 mount /dev/vg/lv /ltilv01/
74 mount /dev/vg/lv /ltilv01
75 mkdir ltilv01
```



Type here to search



```
root@lin-server:~# = sunit=0 swidth=0 blks
naming  =version 2 bsize=4096 ascii-ci=0, ftype=1
log     =internal log bsize=4096 blocks=16384, version=2
= sectsz=512 sunit=0 blks, lazy-count=1
realtime =none extsz=4096 blocks=0, rtextents=0
Discarding blocks...Done.
[root@lin-server ~]# mount /dev/vg/lv1 /ltilv02
[root@lin-server ~]#
[root@lin-server ~]#
[root@lin-server ~]#
[root@lin-server ~]#
[root@lin-server ~]# lsblk
NAME      MAJ:MIN RM  SIZE RO TYPE MOUNTPOINTS
sda        8:0    0   60G  0 disk 
├─sda1     8:1    0    2G  0 part /boot
├─sda2     8:2    0    1G  0 part /boot/efi
└─sda3     8:3    0   44G  0 part
  ├─cs-root 253:0  0   10G  0 lvm  /
  ├─cs-swap 253:1  0    4G  0 lvm  [SWAP]
  ├─cs-tmp  253:2  0    5G  0 lvm  /tmp
  ├─cs-var  253:3  0   20G  0 lvm  /var
  └─cs-home 253:4  0    5G  0 lvm  /home
sdb        8:16   0   30G  0 disk 
└─sdb1     8:17   0    7G  0 part /std5.3
sdc        8:32   0   30G  0 disk 
└─sdc1     8:33   0   20G  0 part
  ├─vg-lv  253:5  0    9G  0 lvm  /ltilv01
  └─vg-lv1 253:6  0    5G  0 lvm  /ltilv02
sr0       11:0   1 1024M 0 rom
[root@lin-server ~]#
```

Activate Windows  
Go to Settings to activate Windows.

11:50 PM 9/24/2025

```
root@lin-server:~  
61 vgcreate vg /dev/sdc1  
62 lvcreate -n lv -L +9G vg  
63 lvcreate -n lv1 -L +5G vg  
64 lsblk  
65 mkfs.ext4 /dev/vg/lv  
66 mkdir ltilv01  
67 mount /dev/vg/lv /ltilv01  
68 mount /dev/vg/lv /ltilv01/  
69 mount /dev/vg/lv /ltilv01  
70 lsblk  
71 mkdir ltilv01  
72 mount /dev/vg/lv /ltilv01  
73 mount /dev/vg/lv /ltilv01/  
74 mount /dev/vg/lv /ltilv01  
75 mkdir ltilv01  
76 ls  
77 mount /dev/vg/lv /ltilv01  
78 mkdir /ltilv01  
79 mount /dev/vg/lv /ltilv01  
80 lsblk  
81 mkdir /ltilv02  
82 mount /dev/vg/lv1 /ltilv02  
83 mount dev/vg/lv /ltilv02  
84 mount dev/vg/lv1 /ltilv02  
85 mount /dev/vg/lv1 /ltilv02  
86 mkfs.xfs /dev/vg/lv1  
87 mount /dev/vg/lv1 /ltilv02  
88 lsblk  
89 history  
[root@lin-server ~]#
```

## Task

-create a logical volume of 10GB using XFS file system.Add another 10GB and extend the logical volume and verify it .

HINT – Use the command “xfs\_growfs” to expand the size at the end of the scenario.

```
root@lin-server:~# lsblk
└─sdb2      8:18    0   10G  0 part
  └─vd-lv  253:7    0   10G  0 lvm
sdc          8:32    0   30G  0 disk
└─sdc1      8:33    0   20G  0 part
  ├─vg-lv  253:5    0    9G  0 lvm  /ltilv01
  └─vg-lvl 253:6    0    5G  0 lvm  /ltilv02
sr0         11:0     1 1024M 0 rom
[root@lin-server ~]# pvcreate /dev/sdb1
WARNING: ext4 signature detected on /dev/sdb1 at offset 1080. Wipe it? [y/n]: y
Wiping ext4 signature on /dev/sdb1.
Physical volume "/dev/sdb1" successfully created.
[root@lin-server ~]# pvs
PV        VG Fmt Attr PSize  PFree
/dev/sda3  cs lvm2 a--  44.00g  4.00m
/dev/sdb1    lvm2 ---   7.00g  7.00g
/dev/sdb2  vd lvm2 a-- <10.00g   0
/dev/sdc1  vg lvm2 a-- <20.00g <6.00g
[root@lin-server ~]# vgx
vgexport vgetend
[root@lin-server ~]# vgx
vgexport vgetend
[root@lin-server ~]# vgextend vd /dev/sdb1
  Volume group "vd" successfully extended
[root@lin-server ~]# vgs
VG #PV #LV #SN Attr   VSize   VFree
cs  1   5   0 wz--n-  44.00g  4.00m
vd  2   1   0 wz--n-  16.99g <7.00g
vg  1   2   0 wz--n- <20.00g <6.00g
[root@lin-server ~]# lvextend -l +100%FREE vd
          Activate Windows
  Size of logical volume vd/lv changed from <10.00 GiB (2559 extents) to 16.99 GiB (4350 extents).
[root@lin-server ~]#
```

2:39 PM 9/25/2025

↳ import favorites |

root@lin-server:~#

```
140 vgremove vd1
141 pvremove /dev/sdb3
142 fdisk /dev/sdb
143 lsblk
144 lvextend -L 10G /dev/vd1/lv
145 lvextend -L 10G /dev/vd/lv
146 vgs
147 pvcreate /dev/sdb1
148 umount /dev/sdb1 /std5.3/
149 umount /dev/sdb1 /std5.3
150 lsblk
151 pvcreate /dev/sdb1
152 pvs
153 vgextend vd /dev/sdb1
154 vgs
155 lvextend -l +100%FREE vd
156 lvs
157 lsblk
158 df -hT /dev/vd/lv
159 mkdir dire
160 mkdir /dire
161 mount /dev/vd/lv /dire
162 \
163 lsblk
164 df -hT /dire
165 xfs_growfs /dire
166 df -hT /dire
167 history |tail -20
168 history |tail -40
169 history |tail -50
[root@lin-server ~]#
```

root@lin-server:~

```
130 lvextend -L 10G /dev/vd/lv
131 lvextend -L 10G /dev/vd/lv2
132 lsblk
133 lvextend -L 10G /dev/vd1/lv
134 fdisk /dev/sd3
135 fdisk /dev/sdb3
136 umount lvm
137 umount lvm
138 lvremove vd/lv
139 lvremove vd1/lv
140 vgremove vd1
141 pvremove /dev/sdb3
142 fdisk /dev/sdb
143 lsblk
144 lvextend -L 10G /dev/vd1/lv
145 lvextend -L 10G /dev/vd/lv
146 vgs
147 pvcreate /dev/sdb1
148 umount /dev/sdb1 /std5.3/
149 umount /dev/sdb1 /std5.3
150 lsblk
151 pvcreate /dev/sdb1
152 pvs
153 vgextend vd /dev/sdb1
154 vgs
155 lvextend -l +100%FREE vd
156 lvs
157 lsblk
158 df -hT /dev/vd/lv
159 mkdir dire
160 mkdir /dire
```



```
root@lin-server:~#
log      =internal log          bsize=4096  blocks=16384, version=2
      =                           sectsz=512  sunit=0 blks, lazy-count=1
realtime =none                  extsz=4096  blocks=0, rtextents=0
data blocks changed from 2620416 to 4454400
[root@lin-server ~]# df -hT /dire
Filesystem  Type  Size  Used  Avail Use% Mounted on
/dev/mapper/vd-lv xfs   17G  154M  17G   1% /dire
[root@lin-server ~]# history |tail -20
148  umount /dev/sdb1 /std5.3/
149  umount /dev/sdb1 /std5.3
150  lsblk
151  pvcreate /dev/sdb1
152  pvs
153  vgextend vd /dev/sdb1
154  vgs
155  lvextend -l +100%FREE vd
156  lvs
157  lsblk
158  df -hT /dev/vd/lv
159  mkdir dire
160  mkdir /dire
161  mount /dev/vd/lv /dire
162  \
163  lsblk
164  df -hT /dire
165  xfs_growfs /dire
166  df -hT /dire
167  history |tail -20
[root@lin-server ~]# history |tail -40
129  lvextend -L 10G /dev/pd/lv
130  lvextend -L 10G /dev/vd/lv
Activate Windows
Go to Settings to activate Windows.
```

```
root@lin-server:~#
sda      8:0    0   60G  0 disk
└─sda1    8:1    0   2G  0 part /boot
  └─sda2    8:2    0   1G  0 part /boot/efi
[─sda3    8:3    0   44G  0 part
  ├─cs-root 253:0  0   10G  0 lvm /
  ├─cs-swap 253:1  0   4G  0 lvm [SWAP]
  ├─cs-tmp  253:2  0   5G  0 lvm /tmp
  ├─cs-var  253:3  0   20G  0 lvm /var
  └─cs-home 253:4  0   5G  0 lvm /home
sdb      8:16   0   30G  0 disk
└─sdb1    8:17   0   7G  0 part
  └─vd-lv  253:7  0   17G  0 lvm /dire
  └─sdb2    8:18   0   10G  0 part
    └─vd-lv  253:7  0   17G  0 lvm /dire
sdc      8:32   0   30G  0 disk
└─sdcl    8:33   0   20G  0 part
  ├─vg-lv  253:5  0   9G  0 lvm /ltl1v01
  └─vg-lv1 253:6  0   5G  0 lvm /ltl1v02
sr0     11:0    1 1024M 0 rom
[root@lin-server ~]# df -hT /dire
Filesystem  Type  Size  Used  Avail Use% Mounted on
/dev/mapper/vd-lv xfs   10G  104M  9.9G   2% /dire
[root@lin-server ~]# xfs_growfs /dire
meta-data=/dev/mapper/vd-lv      isize=512  agcount=4, agsize=655104 blks
                                sectsz=512  attr=2, projid32bit=1
                                =           crc=1   finobt=1, sparse=1, rmapbt=0
                                =           reflink=1 bigtime=1 inobtcount=1 nrext=6
data      =           bsize=4096  blocks=2620416, imaxpct=25
                                =           sunit=0   swidth=0 blks
naming    =version 2           bsize=4096  ascii-ci=0, ftype=1   Activate
log       =internal log        bsize=4096  blocks=16384, version=2

```

## HOW TO REMOVE LVM

---

-UNMOUNT THE mount point using UMOUNT COMMAND

- o Umount /lvm

-delete the mount point (directory) → OPTIONAL

```
rm -r /lvm      //or  
rmdir /lvm
```

-remove the logical volume

```
Lvremove vg/lv
```

-remove the volume group

```
Vgremove vg
```

-remove the physical volume

```
Pvremove /dev/sdb2 /dev/sdc1
```

-delete the partition

```
fdisk /dev/sdb →d ,w
```

```
fdisk /dev/sdc →d ,w
```

## **PACKAGE MANAGEMENT :**

---

- In windows we have SOFTWARES
- In linux we have PACKAGES

## **WAYS TO INSTALL PACKAGE :**

---

### **1) ONLINE**

- a. Mirror server for centos ( FREE )
- b. Redhat Satellite Servers ( PAID )

### **2) OFFLINE → we will use .**

- a. Download from internet
- b. From CD/DVD

## **NAME OF PACKAGE :**

---

**Name-version-release-architecture.extension**

Architecture :

- 32 bit =i686
- 64 bit =x86\_64
- Both 32 & 64 =noarch

Extension :

- .rpm ( Redhat Package Manager )
- .deb , dpkg

Package manager :

-it's a tool that help in :

- installing a package
- updating / upgrading the package
- getting the information of package
- remove a package
- update the whole OS
- patching the whole OS

NAMES OF FEW PACKAGE MANAGER ARE :

- RPM ( Redhat Package Manager )
- YUM ( Yellowdog Updater Modifier )
- APT ( Advanced Packaging Tool )
- DNF ( DaNdiFied Packaging Manager )

Ex :

Yum install httpd

Apt install httpd

Dnf install httpd

Day 4

25 sep 2025

RPM:

- Redhat package manager
- Default package manager to install any package
- It helps in offline package installation
- It require dependent package to be installed manullay

Commands :

- Install
  - o rpm -ivh <full package name >.rpm
    - install ( mandatory )
    - verbose ( optional )
    - hashing ( optional )
- update :
  - o rpm Uvh <full package name > .rpm
    - U - update ( in caps )
- Querey
  - o Rpm -q package name // for single package
  - o Rpm -qa //for all packages
- Uninstall
  - o Rpm -ev package name
    - E – for erase/uninstall
    - V – verbose ( optional ) – it shows the log

IN LAB LOCATION OF THE PACKAGES → /var/ftp/pub

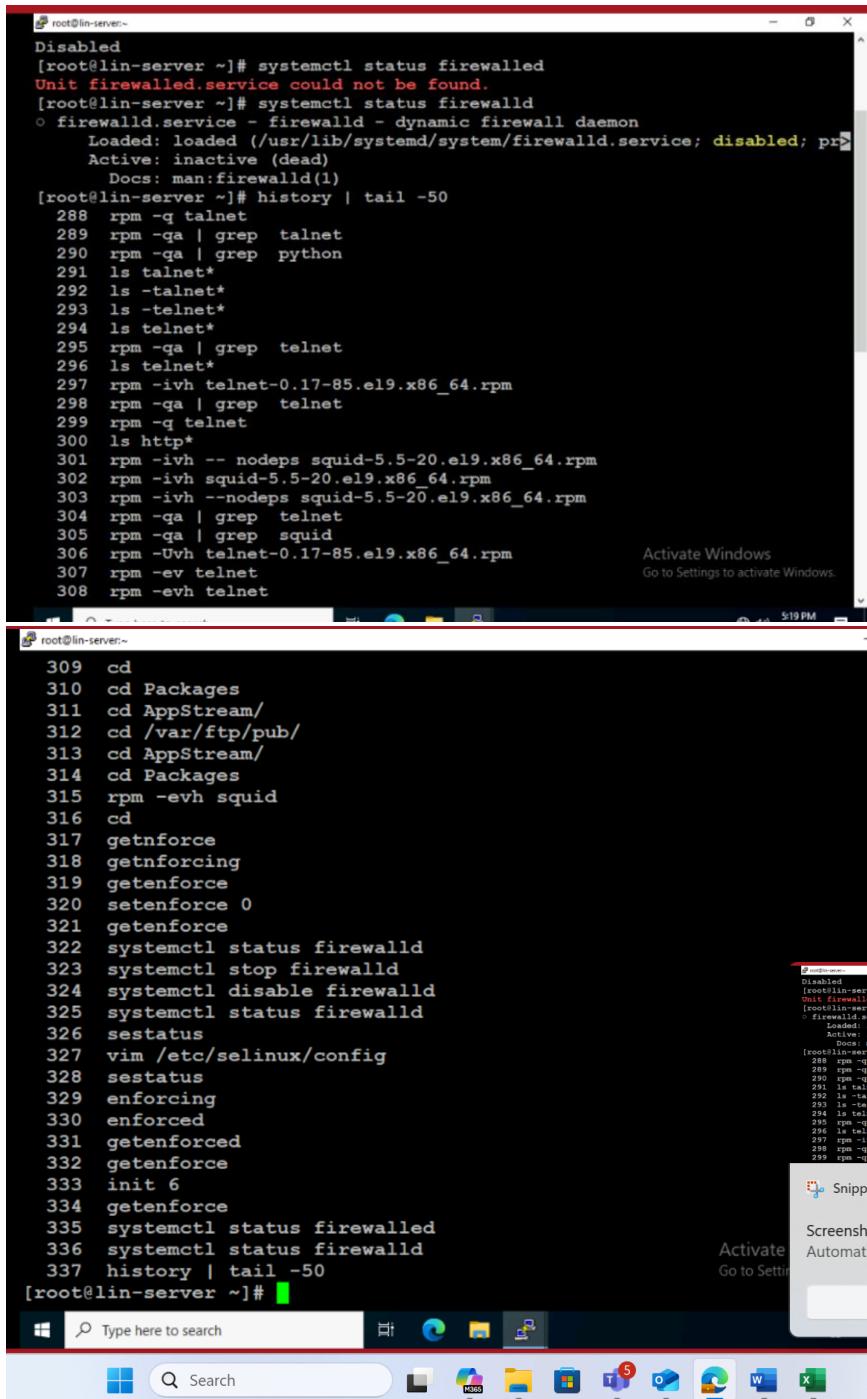
Problems:

- Big name
- Dependence
- Path cd

ON SERVER MACHINE “;

- Turn off the firewall
  - o Systemctl stop firewalld
  - o systemctl disable firewalld
  - o systemctl status firewalld
- Turn off SELinux
  - o Vim/etc/selinux/config
- Configure yum server

```
root@lin-server:~  
Disabled  
[root@lin-server ~]# systemctl status firewalld  
Unit firewalld.service could not be found.  
[root@lin-server ~]# systemctl status firewalld  
● firewalld.service - firewalld - dynamic firewall daemon  
   Loaded: loaded (/usr/lib/systemd/system/firewalld.service; disabled; pr  
     Active: inactive (dead)  
       Docs: man:firewalld(1)  
[root@lin-server ~]# history | tail -50  
288 rpm -q telnet  
289 rpm -qa | grep telnet  
290 rpm -qa | grep python  
291 ls telnet*  
292 ls -telnet*  
293 ls -telnet*  
294 ls telnet*  
295 rpm -qa | grep telnet  
296 ls telnet*  
297 rpm -ivh telnet-0.17-85.el9.x86_64.rpm  
298 rpm -qa | grep telnet  
299 rpm -q telnet  
300 ls http*  
301 rpm -ivh --nodeps squid-5.5-20.el9.x86_64.rpm  
302 rpm -ivh squid-5.5-20.el9.x86_64.rpm  
303 rpm -ivh --nodeps squid-5.5-20.el9.x86_64.rpm  
304 rpm -qa | grep telnet  
305 rpm -qa | grep squid  
306 rpm -Uvh telnet-0.17-85.el9.x86_64.rpm  
307 rpm -ev telnet  
308 rpm -evh telnet  
309 cd  
310 cd Packages  
311 cd AppStream/  
312 cd /var/ftp/pub/  
313 cd AppStream/  
314 cd Packages  
315 rpm -evh squid  
316 cd  
317 getnforce  
318 getnforcing  
319 getenforce  
320 setenforce 0  
321 getenforce  
322 systemctl status firewalld  
323 systemctl stop firewalld  
324 systemctl disable firewalld  
325 systemctl status firewalld  
326 sestatus  
327 vim /etc/selinux/config  
328 sestatus  
329 enforcing  
330 enforced  
331 getenforced  
332 getenforce  
333 init 6  
334 getenforce  
335 systemctl status firewalled  
336 systemctl status firewalld  
337 history | tail -50  
[root@lin-server ~]#
```



**YUM server :**

---

- Yellowdog update modify
- We need to create this server for offline usages
- IMP location : /etc/yum.repos.d/

**On server machine :**

---

- Go to “/etc/yum.repos.d/”
- Move all the existing file to a different location
- Create a new file with the following code :

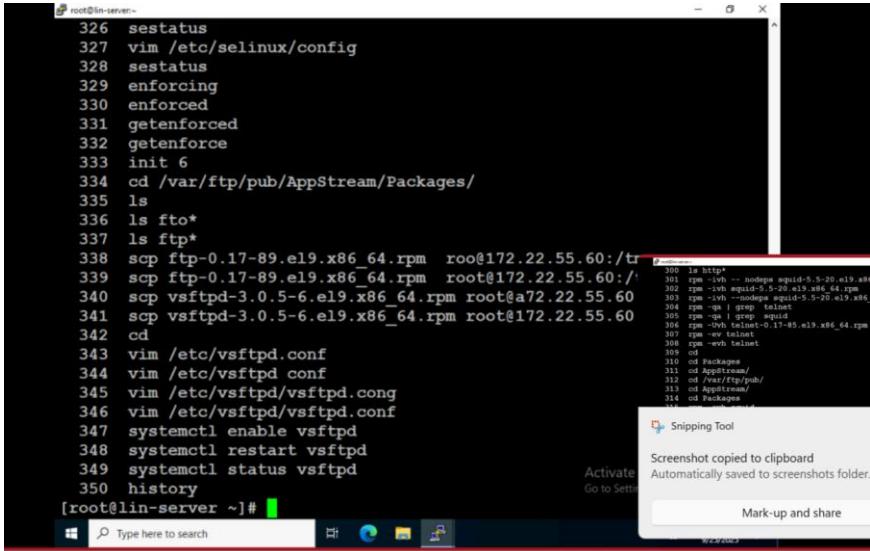
Vim reposerver.repo

[AppStream]

```
name=AppStream Repo  
baseurl=file:///var/ftp/pub/Appsstream/  
gpgcheck=0  
enables=1
```

[BaseOS]

```
name=BaseOS Repo  
baseurl=file:///var/ftp/pub/BaseOS/  
gpgcheck=0  
enables=1
```



```

326 sestatus
327 vim /etc/selinux/config
328 sestatus
329 enforcing
330 enforced
331 getenforced
332 getenforce
333 init 6
334 cd /var/ftp/pub/AppStream/Packages/
335 ls
336 ls fto*
337 ls ftp*
338 scp ftp-0.17-89.el9.x86_64.rpm root@172.22.55.60:/tmp
339 scp ftp-0.17-89.el9.x86_64.rpm root@172.22.55.60:/tmp
340 scp vsftpd-3.0.5-6.el9.x86_64.rpm root@172.22.55.60
341 scp vsftpd-3.0.5-6.el9.x86_64.rpm root@172.22.55.60
342 cd
343 vim /etc/vsftpd.conf
344 vim /etc/vsftpd.conf
345 vim /etc/vsftpd/vsftpd.conf
346 vim /etc/vsftpd/vsftpd.conf
347 systemctl enable vsftpd
348 systemctl restart vsftpd
349 systemctl status vsftpd
350 history
[root@lin-server ~]# 
```

## RAID:

=====

Create 2 partitions each of 10GB from dev/sdb and sdc with the id type of 83

-install the required package for RAID:

- yum install -y mdadm

Examine the disk for RAID configuration

-mdadm -E /dev/sdb1 /dev/sdc1

To create RAID 0

-mdadm --create /dev/md0 --level=stripe --raid-devices=2 /dev/sdb1 /dev/sdc1

Create file system for /dev/md0

- mkfs.xfs /dev/md0

**Formatted:** Font: 14 pt

create a mount point

- mkdir /raid0

mount the partition

- mount /dev/md0 /raid0/

df -hT for check

DAY 5

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runlevel = old method

systemctl get-default = to see the run level

systemctl set-default multi-user.target = to change the runlevel

**to chake ip addresss :**

ifconfig

ip address

hostname

**to check the active port :**

ss

netstat -tulpn

t – tcp

u- udp

l-listen

p-port

n-number

**for user who loged in your system (multiple user ) :**

who

w

**add user :**

useradd <username>

useradd aj

passwd aj centos9

to check that :

```
cat /etc/passwd |grep aj <aj is username>
```

super user :

```
cmd : visudo
```

```
:set number
```

```
Go line 100
```

```
Press O
```

```
Insert
```

```
Aj ALL(ALL)= ALL → like for root
```

```
:wq!
```

For create new user in it:

```
Type sudo in front of it
```

```
Sudo useradd az
```

To check it is created cmd :

```
Cat /etc/passwd | grep az
```

sudo = regular user + limited root privileges

Formatted: Font: 14 pt, Font color: Red

```
391 ifconfig  
392 ifconfig  
393 ifconfig | grep init  
394 ifconfig | grep inet  
395 ip address  
396 hostname -I  
397 netstat -tolpn  
398 ss  
399 who  
400 w  
401 useradd aj  
402 passwd aj  
403 useradd aj  
404 passwd aj  
405 cat /etc/passwd |grep aj  
406 visudo  
407 su -aj  
408 su - aj  
409 history | tail -50  
[root@lin-server ~]#
```

Create group and add user into it:

**Scenario 1 :**

Create user and add it into the group at the same time :::::

Groupadd five

Usersadd -G five manish

**Scenario 2:**

Create user and add it into group:::

**Useradd aman**

**Usermod -G five aman**

**Cat /etc/group | grep five for check**

**For deleting user from group :**

**Userdel -r aman**

**Cat /etc/group | grep five = for check**

**Simply remove it add into another group without recreating ::**

**Usermod -G "" five**

**Cat /etc/group |grep aman**

**Groupadd dc**

**Usermod -G dc aman**

**Usermod -L new name old name                                  = TO CHANGE THE NAME**

### **GROUP:**

- **primary group (g)**
  - o **bonded to only one**
- **secondary group (G )**
  - o **multiple**

### **TASK**

### **TASK:**

---

Create a group “poc” and add new user with

```
-username : jack  
-comment : capt.sparrow  
-user id : 5000  
-default shell : /bin/sh  
-password : blackpearl
```

Add verify

Hint : man useradd

```
428 groupadd poc  
429 man useradd  
430 useradd -u 5000 -s /bin/sh -c "Capt. Sparow" jack  
431 usermod -u 5000 -s /bin/sh -c "Capt. Sparow" jack  
432 passwd jack  
433 usermod -G poc jack  
434 cat /etc/group |grep poc  
435 id jack  
436 cat /etc/group |grep poc  
437 cat /etc/group |grep jack  
438 history | tail -15  
[root@lin-server ~]#
```

FILE SHARING :

NFS

FTP

SAMBA

- NFS

Network file sharing

Shares data with same OS

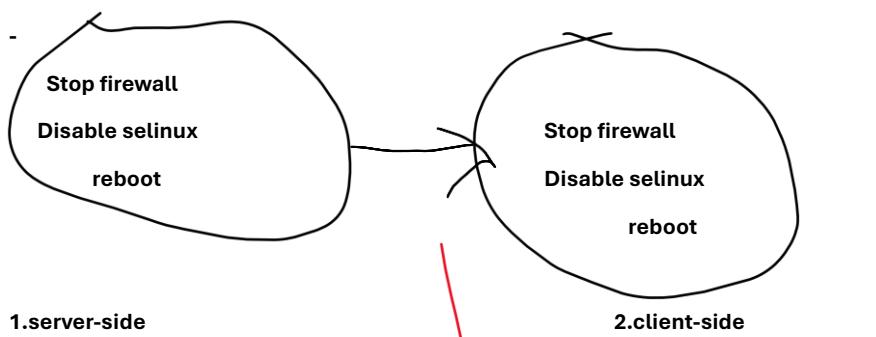
Package : nfs-utils , rpcbind

Port NO : 2049 ,111

CONFIG File : /etc/exports

Service name : nfs-server , rpcbind

- Same machine OS
  - Linux → linux
  - Windows → windows
  - server must be linux



Install pkgs

- nfs-utils

- rpc bind

- Create a directory that will be shared with client

- edit the conf. file  
the service

- Install pkgs :

- nfs-utils

- rpc bind

create a dir. That will  
dir.

- Access the data

mount the server

- restart

Cmd :

## ON SERVER

### Off firewall and selinux

- Install required packages :
  - o Yum install -y nfs-utils rpcbind
- Create the dir.
  - o Mkdir /nfsserver
  - o Touch /nfsserver/testfile.txt
- Edit the configuration file: --?backup
  - o Cp /etc/export /etc/exports-backup
  - o Vim /etc/exports
    - <what-to-share> <to-whom-to-share>(how-to-share)
      - <to-whom-to-share>
        - o \* → All/Everyone
        - o 172.22.55.59 → Ip address
        - o 172.22.55.0/24 → to specific range
      - how-to-share
        - o no\_root\_squash
          - giving user root prm .
        - rw :
          - giving read + write
        - sync
          - syning asap with the source
          - client do server impact at the same time
  - :wq!

Enable , start and check the status of the NFS service .

- Systemctl enable nfs-server rpcbind
- Systemctl start nfs-server rpcbind
- Systemctl status nfs-server rpcbind

Export the data :

- Exportfs

#### On client side :

- **Install required packages :**
  - o Yum install -y nfs-utils rpcbind
- **Create the dir. To receive the server data**
  - o Mkdir /nfsclient
- **Examin the shared folder**
  - o Showmount -e <server ip address >
- **Mount the NFS folder**
  - Mount <server ip>:/nfsserver /nfsclient

-

#### - **FTP**

#### File Transfer Protocle :

- **FTP is useed to sharing the data using :**
  - o Web browser ( any one can access the data , its unsecure )
  - o Using cmd line / terminal ( its secure )
- **PACKAGE :**
  - o FTP ,VSFTPD
- **PORT NO :**
  - o 20, 21
- **CONFIG FILE :**
  - o /etc/vsftpd/vsftpd.conf
- **Service name :**
  - o vsftpd

---

#### **FTP ON SERVER MACHINE :**

---

- **INSTALL PACKAGES :**

---

  - o Yum install -y ftp vsftpd -cmd

---
- **Edit the config file :**

---

- o **Cp /etc/vsftpd/vsftpd.conf /etc/vsftpd/vsftpd.conf-bkp**
- o **Vim /etc/vsftpd/vsftpd.conf → open it**
  - Move to line 86 → uncomment the line
  - Line 124 write → **userlist\_file=/etc/vsftpd/userlist**
  - Line 125 write → **Userlist\_deny=NO**
- o **Cat > /etc/vsftpd/userlist**
  - Ftpuser1
  - Ftpuser2
- o **Useradd ftpuser1**
- o **Useradd ftpuser2**
- o **Passwd ftpuser1**
  - Ftpuser1
- o **Passwd ftpuser2**
  - Ftpuser2
- o **Systemctl enable vsftpd**
- o **Systemctl start vsftpd**
- o **Systemctl status vsftpd**
- o **Systemctl restart vsftpd**
  - **ftp 172.22.55.59**
  - **Ftpuser1**
    - Password → ftpuser1
    - Ls
    - Put redme.txt
    - Ls
    - Get f1.txt
    - Bye

#### Rwmove FTP :

- o **Vim /etc/vsftpd/vsftpd.conf**
- o **Remove line → 124 1nd 125 (press d two time for delete and for undo press u)**
- o **Line 86 :→ add comment**
- o **Systemctl restart vsftpd**
- o **Systemctl status vsftpd**

#### - For backup :

- o **Cp /etc/vsftpd/vsftpd.conf-bkp /etc/vsftpd/vsftpd.conf**
- o

```
748 rpm -qa | grep ftp
749 yum install -y ftp
750 rpm -qa | grep ftp
751 cp /etc/vsftpd/vsftpd.conf /etc/vsftpd/vsftpd.conf-bkp
752 cd
753 rpm -qa | grep ftp
754 cp /etc/vsftpd/vsftpd.conf /etc/vsftpd/vsftpd.conf-bkp
755 cd /tmp
756 cat > share
757 vim /etc/vsftpd/vsftpd.conf
758 cat > /etc/vsftpd/userlist
759 useradd ftpuser1
760 useradd ftpuser2
761 passwd ftpuser1
762 passwd ftpuser2
763 systemctl enable vsftpc-service
764 systemctl enable vsftpd-service
765 systemctl enable vsftpd
766 systemctl start vsftpd
767 systemctl status vsftpd
768 systemctl restatus vsftpd
769 systemctl status vsftpd
770 touch redme.txt
771 touch /home/ftpuser1/f1.txt
772 systemctl restart vsftpd
773 ftp 172.22.55.59
774 ls
775 history
[root@lin-server tmp]#
```



### - Samba

- o Same as well different
  - Liux→linux
  - Linux→windows
  - Server must be linux
- It is used to share the data between differet OS
- i.e, linus and windows/linux/macos
- it uses SMB3.0 protocole to connect
- package :
  - o sambha , sambha-utils , cifs-utils

- **port no :**
  - o 139
- **config file :**
  - o /etc/samba/smb.conf
- **Service name :**
  - o Smb

#### SAMBA ON SERVER MACHINE :

- **Install packages :**
  - o Samba cifs-utils
    - Cmd → rpm -qa | grep samba → for check
    - Yum install -y samba cifs-utils
- **Create group and users within this to access samba**
  - o Groupadd smbgrp
  - o Useradd -G smbgrp smbuser1
  - o Passwd smbuser1
    - →smbuser1
  - o Create a samba shared folder
  - o Mkdir /samba
  - o Touch /samba/sambafile.txt:
    - Mkdir sambafile.txt
    - Touch /samba/sambafile.txt
    - Ls /samba/
  - o Permissions
    - Ls -ld /samba/
    - Chgrp smbgrp /samba/
    - Chmod 777 /samba/
    - Ls -ld /samba/
  - o Backup file
    - Cp /etc/samba/smb.conf /etc/samba/smb.conf-bkp
  - o Open :
    - Vim /etc/samba/smb.conf
    - On last line ( by shift + G ) type :

```
41      directory mask = 0775
42 [samba]
43      comment = Aniket's shareble samba
44      browsable = yes
45      path = /samba
46      valid users = @smbgrp
47      writable = yes
```

- **Testparm**
- **Smbpasswd -a smbuser1**
- **Systemctl enable smb**
- **Systemctl restart smb**
- **Systemctl start smb**
- **Systemctl status smb**

#### ON CLIENT SIDE :

```
83 mkdir /smbclient
84 mount //172.22.55.59/samba /smbclient -o username=smbuser1
85 yum install -y cifs-utils
86 mount //172.22.55.59/samba /smbclient -o username=smbuser1
87 df -hT
88 history | tail -20
[root@client ~]#
```

Cd /smbclient/

Ls

#### REMOVE SAMBA :

- **Systemctl stop smb**
- **Systemctl disable smb**
- **Yum remove -y samba cifs-client**

#### TASK :

Create a new shared folder with ftp and vsftpd package in it and share it with the client machine with read-only permission . ensure not to remove other existing NFS shared directory

→]

On server

#### To find th file :

```
Find / -name ftp*.rpm
```

**Makke dir. Pkg**

**Cd var/ftp/pub/AppStream/Packages/**

**Cp ftp-0 ..... /pkg**

**Cp vsftpd- ..... /pkg**

**Vim etc/exports**

**/Pkg 172.22.55.60(ro )**

**Systemctl enable nfs-server rpcbind**

**Start**

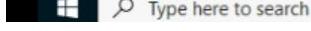
**Restart**

**Status**

**Exportfs**

```
475 cp /var/ftp/pub/AppStream/Packages/
476 cd /var/ftp/pub/AppStream/Packages/
477 ls ftp*
478 cp ftp-0.17-89.el9.x86_64.rpm /pkg
479 cp vsftpd-3.0.5-6.el9.x86_64.rpm /pkg/
480 cd
481 cp /etc/export /etc/export-backup
482 cp /etc/export /etc(exports-backup
483 cp /etc(exports /etc(exports-backup
484 vim /etc(exports
485 systemctl enable nfs-server rpcbind
486 systemctl start nfs-server rpcbind
487 systemctl status nfs-server rpcbind
488 systemctl restart nfs-server rpcbind
489 systemctl status nfs-server rpcbind
490 exportfs
491 history | tail -20
492 cd /pkg
493 ls
494 vim /etc(exports
495 systemctl enable nfs-server rpcbind
```

Act  
Got

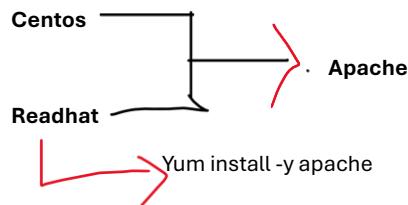


### On client

```
Mkdir /clipkg
Showmount -e 172.22.55.59
Mount 172.22.55.59:/pkg /clipkg/
Df -h
Cd clipkg
Ls
```

```
103 yum install -y nfs-utils rpcbind  
104 mkdir /nfspkg  
105 showmount -e 172.22.55.59  
106 mount 172.22.55.59:/pkg /nfspkf  
107 showmount -e 172.22.55.59  
108 mount 172.22.55.59:/pkg /nfspkg/  
109 showmount -e 172.22.55.59  
110 mount 172.22.55.59:/pkg /nfspkg/  
111 df -h  
112 cd /nfspkg/  
113 ls  
114 history | tail -25  
[root@client nfspkg]#
```

## APACHE



Ubuntu → apache2 → apt install -y apache2

```
Yum install -y httpd
```

```
System enable httpd
```

```
System start httpd
```

```
System status httpd
```

Go to the browser < edge > of puTTy → and search for the URL :

<http://172.22.55.59> <server ip >

go to the server :

```
cd /var/www/html/
```

```
ls
```

```
vim index.html
```

```
<html>
    <body bgcolor='orange' color='black' >
        <h1 align='center' >
            its mi ANIKE
        </h1>
        <marquee>
            from MAHARASHTRA
        </marquee>
    </body>
</html>
```

```
System restart httpd
```

```
System status httpd
```

Go to the browser and refresh the page

<http://172.22.55.59> → i.e <server ip >

```
[root@lin-server ~]# history | tail -20
802 yum install -y samba httpd
803 systemctl stop smb
804 systemvctl disable smb
805 systemctl disable smb
806 yum remove -y samba cifs-client
807 yum install -y httpd
808 cd
809 systemctl enable httpd
810 systemctl start httpd
811 systemctl status httpd
812 cd /var/www/html/
813 ls
814 vim index.html
815 systemctl restart httpd
816 systemctl status httpd
817 vim index.html
818 history | tail-20
819 cd
820 history | tail-20
821 history | tail -20
[root@lin-server ~]#
```

## DAY 7

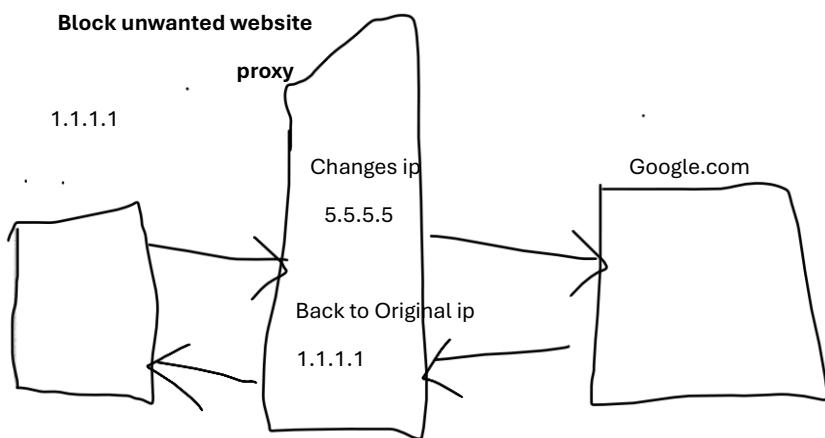
### SQUID PROXY :

---

**Hide your identity over the internet**

**It monitors**

**Block unwanted website**



**Hide the identity over the internet**

**2 major job of squid :**

- Monitor the traffic over the network
- Blocks the unwanted website

**Requirement:**

- PACKAGE :
  - o SQUID
- PORT NUMBER :
  - o 3128
- CONFIG FILE :
  - o /etc/squid/squid.conf
- Service name :
  - o Squid

**ENGINX :**

- Faster
- Load balancing
- Secure

**DNS :**

---

FQDN : fully Qualified Domain Name

DNS helps in resolving name to IP address and vice-versa

In LINUX its called BIND (Berkeley Interne Name Domail )

**Package :**

- Bind , bind-utils

**Port number :**

- 53/tcp & 53/udp

**Config number :**

- /etc/named.conf

**Service name:**

- Named

To list / to check DNS IP in linux :

- Cat /etc/resolv.conf

**Pre-req :**

- Domain name : training.com
- Server name : server.training.com
- Client name : client.training.com

server.training.com

```
[root@lin-server ~]#  
[root@lin-server ~]# hostname  
lin-server  
[root@lin-server ~]# hostnamectl set-hostname server.training.com  
[root@lin-server ~]#  
[root@lin-server ~]#  
[root@lin-server ~]# exc bash  
bash: exc: command not found...  
[root@lin-server ~]# exec bash  
[root@server ~]#  
[root@server ~]#  
[root@server ~]# hostname  
server.training.com  
[root@server ~]#
```

Activ  
Go to

Yum install -y bind bind-utils

Cp /etc/named.conf /etc/named.conf-bkp

Vim /etc/named.conf

:set number

:11

set your server ip end with semi colon

:

```
8 //  
9  
10 options {  
11     listen-on port 53 { 127.0.0.1; 127.22.55.59; };  
12     listen-on-v6 port 53 { ::1; };  
13     directory      "/var/named";  
14     dump-file      "/var/named/data/cache_dump.db";  
15     statistics-file "/var/named/data/named_stats.txt";  
16     memstatistics-file "/var/named/data/named_mem_stats.txt";  
17     secroots-file  "/var/named/data/named.secroots";  
18     recursing-file "/var/named/data/named.reCURsing";  
19     allow-query     { localhost; };  
20  
21     /*  
22         - If you are building an AUTHORITATIVE DNS server, do NOT enable recursion.
```

:19

```
17     secroots-file  "/var/named/data/named.secroots";  
18     recursing-file "/var/named/data/named.reCURsing";  
19     allow-query     { localhost; any; };  
20  
21     /*
```

:wq!

Systemctl enable named

Systemctl restart named

Systemctl start named

Systemctl status named

Back to

Vim /etc/named.conf

: press : shift + G for reverse write server ip in reverse manner like this  
: ser number for 172.22.55.59 → 55.22.172

```
};  
  
zone "." IN {  
    type hint;  
    file "named.ca";  
};  
  
zone "training.com" IN {  
    type master;  
    file "forward.training.com";  
    allow-update {none;};  
};  
  
zone "55.22.172.in-addrarpa" IN {  
    type master;  
    file "reverse.training.com";  
    allow-update {none;};  
};
```

:wq!

Cd /var/named

Ls

Vim /etc/named.conf

Cd /var/named

Ls

Cp named.localhost forward.training.com

Ls

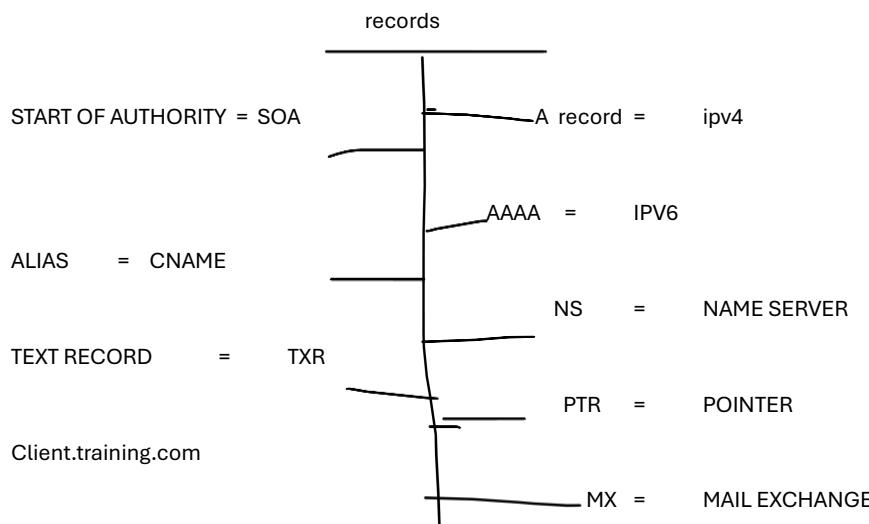
Vim forward.training.com

```

1 $TTL 1D
2 @ IN SOA @ server.training.com. (
3                               0      ; serial
4                               1D     ; refresh
5                               1H     ; retry
6                               1W     ; expire
7                               3H )   ; minimum
8 @ IN NS    server.training.com.
9 @ IN A     172.22.55.59
10 server IN A    172.22.55.59
11 client IN A   172.22.55.60
~ 
~ 
~ 

```

:wq!



```

[root@client ~]# hostnamectl set-hostname client.training.com
[root@client ~]#
[root@client ~]# exec bash

[root@client ~]#
[root@client ~]#
[root@client ~]#
[root@client ~]# hostname
client.training.com
[root@client ~]# 

```

Activate Windows  
Go to Settings to activate Windows

```
Cp forward.training.com reverse.training.com
```

```
Vim reverse.training.com
```

```
zadbuks@lin-server:/var/named
1 $TTL 1D
2 @ IN SOA @ server.training.com. (
3                                     0 ; serial
4                                     1D ; refresh
5                                     1H ; retry
6                                     1W ; expire
7                                     3H ) ; minimum
8 @ IN NS server.training.com.
9 @ IN PTR training.com
10 @ IN A 172.22.55.59
11 server IN A 172.22.55.59
12 client IN A 172.22.55.60
13 59 IN PTR server.training.com.
14 60 IN PTR client.training.com.

~
```

```
Ls -l *.training.com
```

```
Chgrp named *:training.com
```

To check :

```
Named checkconf -z /etc/named.conf
```

```
-rw-r----- 1 root named 312 Sep 30 06:24 reverse.training.com
[root@server named]#
[root@server named]#
[root@server named]# named-checkconf -z /etc/named.conf
zone training.com/IN: loaded serial 0
zone 55.22.171.in-addr.arpa/IN: loaded serial 0
zone localhost.localdomain/IN: loaded serial 0
zone localhost/IN: loaded serial 0
zone 1.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.ip6.arpa/IN: loaded se
rial 0
zone 1.0.0.127.in-addr.arpa/IN: loaded serial 0
zone 0.in-addr.arpa/IN: loaded serial 0
[root@server named]#
```

Activate Windows  
Go to Settings to activate Windows.

If it serial 0 then it is correct

```
[root@server named]# named-checkzone forward forward.training.com
zone forward/IN: loaded serial 0
OK
[root@server named]# named-checkzone reverse reverse.training.com
zone reverse/IN: loaded serial 0
OK
[root@server named]#
```

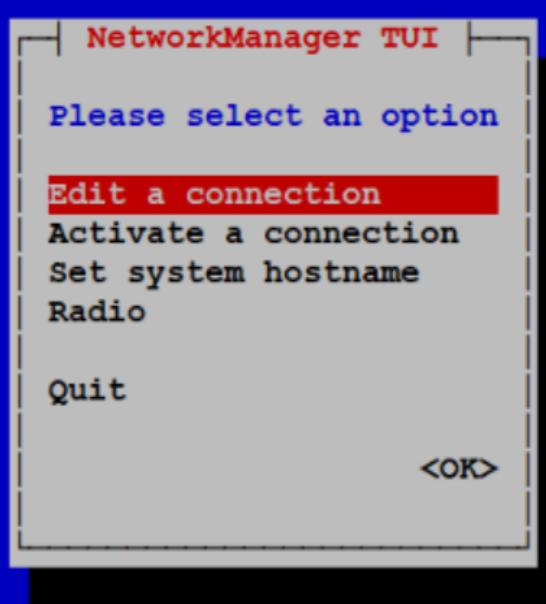
Activate Windows  
Go to Settings to activate Wind

Ready to restart

Add the dns entry in ip address

```
zone reverse/IN: loaded serial 0
OK
[root@server named]# systemctl enable named
[root@server named]# systemctl restart named
[root@server named]# systemctl status named
● named.service - Berkeley Internet Name Domain (DNS)
```

Cmd: Nmtui

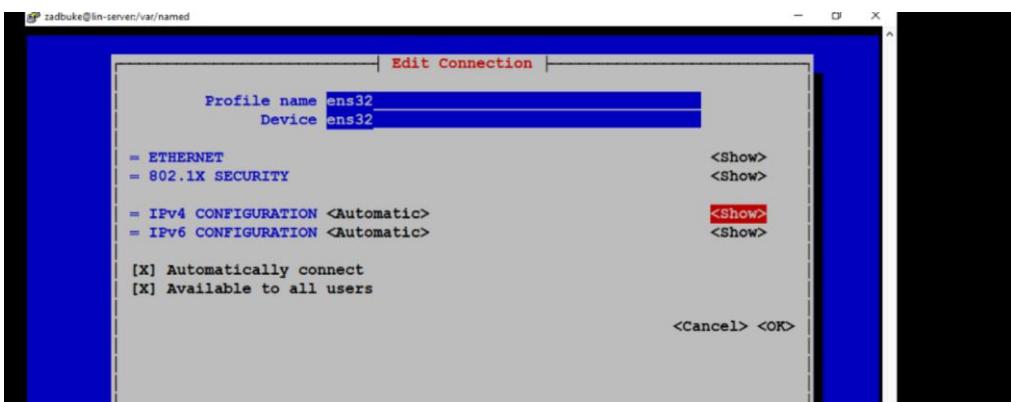
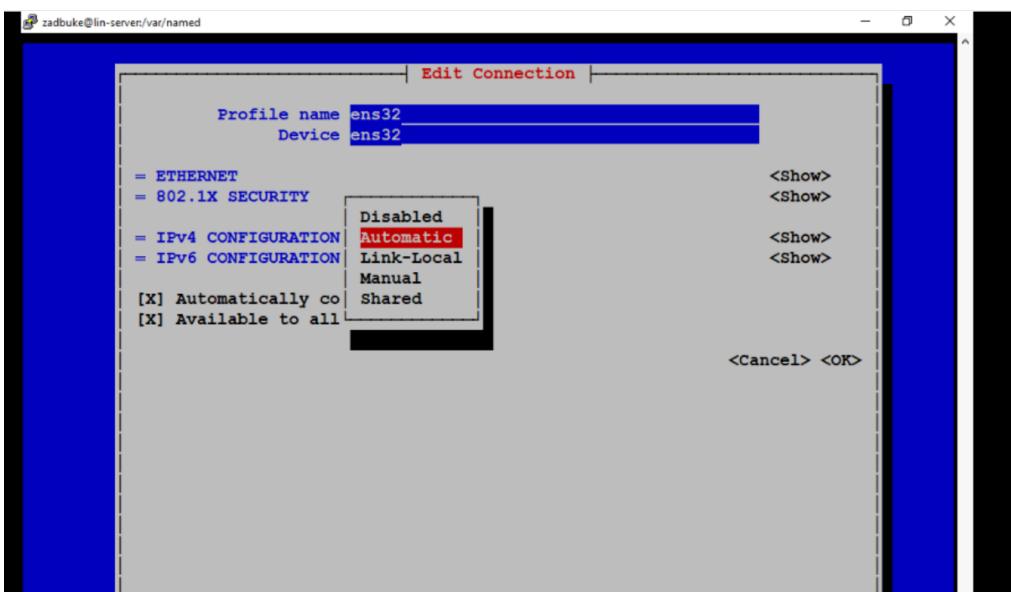


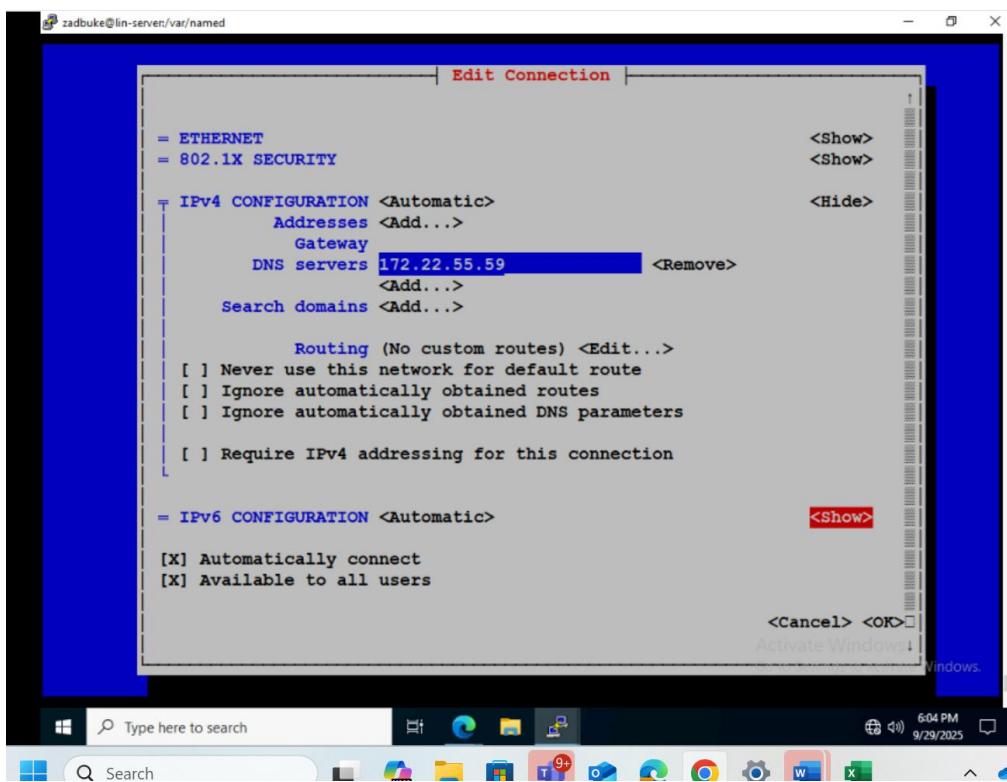
Ethernet  
Profile 1  
**ens32**  
Loopback  
lo

<Add>  
<Edit...>  
<Delete>

<Back>

Activate Wind  
Go to Settings to a





```
[root@server named]# 
[root@server named]# 
[root@server named]# systemctl restart NetworkManager
[root@server named]# 
[root@server named]# cat /etc/resolv.conf
# Generated by NetworkManager
search training.com
[root@server named]#
```

To check working or not :

Dig training.com

Nslookup training.com

If it same not working on client then open → vim /etc/hosts

Shift+G , O

```
zadbuke@lin-server:/var/named
127.0.0.1    localhost localhost.localdomain localhost4 localhost4.localdomain4
::1          localhost localhost.localdomain localhost6 localhost6.localdomain6
172.22.55.59    server.training.com
172.22.55.60    client.training.com
~
```

Ping client.training.com → for stop ctrl + C

ON client:

Nmtui

Same as server

```
search training.com
[root@server named]# dig training.com

; <>> DiG 9.16.23-RH <>> training.com
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 30979
;; flags: qr aa rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 1232
; COOKIE: 97b6b7bdd455df350100000068db32fae6086ade9d2885fc (good)
; QUESTION SECTION:
;training.com.           IN      A

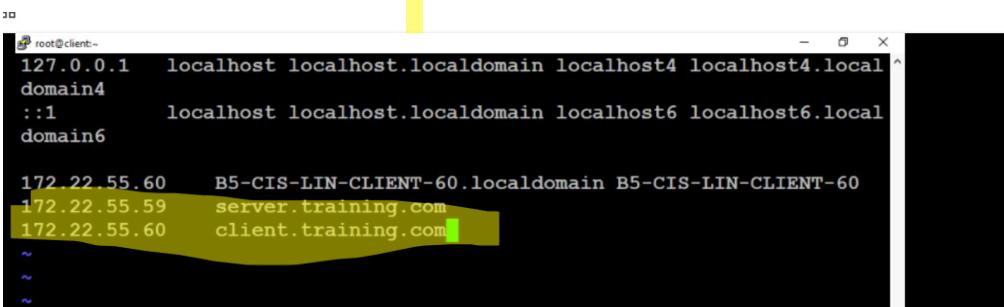
;; ANSWER SECTION:
training.com.        86400   IN      A       172.22.55.59

;; Query time: 1 msec
;; SERVER: ::1#53(::1)
;; WHEN: Tue Sep 30 07:01:38 IST 2025
;; MSG SIZE  rcvd: 85

[root@server named]# nslookup training.com
Server:      ::1
Address:     ::1#53

Name:  training.com
Address: 172.22.55.59
Activate Window
Go to Settings to ac
[root@server named]# systemctl restart NetworkManager
```

If its not working then go → vim /etc/hosts



```
root@client:~          -  ⌂  x
127.0.0.1  localhost localhost.localdomain localhost4 localhost4.local
domain4
::1        localhost localhost.localdomain localhost6 localhost6.local
domain6

172.22.55.60  B5-CIS-LIN-CLIENT-60.localdomain B5-CIS-LIN-CLIENT-60
172.22.55.59  server.training.com
172.22.55.60  client.training.com
~
~
~
```

## LINUX SENDMAIL

This is used to send and receive the email

Install POSTFIX for sending email

Install DOVECOT for receiving email

GUI tools for listing email :

- MS office
- Thunderbird
- squirrelMail
- SendMail

We will use telnet (telnet-server) to send and receive emails

Domain name : training.com

Server name : server.training.com

Server IP : 172.22.55.59

**On server**

**Yum install -y telnet server**

**Systemctl enable telnet.socket**

**Systemctl start telnet.socket**

**Systemctl status telnet.socket**

**Adduser user1**

**Adduser user2**

**Passwd user1**

**->user1**

**Passwd user2**

**→user2**

**Yum install -y postfix**

**Cp /etc/postfix/main.cf /etc/postfix/main.cf-bkp**

**Vim /etc/postfix/main.cf**

**:set nu**

**:94 →uncomment and write (change value )**

```
91 # from gethostname(). $myhostname is used as a default
92 # other configuration parameters.
93 #
94 myhostname = server.training.com █
95 #myhostname = virtual.domain.tld
96
```

**:102 →uncomment and write (change value )**

```
98 # The default is to use $myhostname
99 # $mydomain is used as a default val
100 # parameters.
101 #
102 mydomain = training.com
103
104 # SENDING MAIL
```

:117 → uncomment only

```
115 # to recipient addresses that have no localpart
116 #
117 myorigin = $myhostname
118 #myorigin = $mydomain
119
120 # RECEIVING MAIL
```

:132 → uncomment

:135 → comment

```
125 # This parameter specifies the list of network interfaces
126 #
127 # See also the proxy_interfaces parameter, for network addresse
128 # are forwarded to us via a proxy or network address translator
129 #
130 # Note: you need to stop/start Postfix when this parameter chan
131 #
132 inet_interfaces = all
133 #inet_interfaces = $myhostname
134 inet_interfaces = $myhostname, localhost
135 inet_interfaces = localhost
136
137 # Enable IPv4, and IPv6 if supported
138 inet_protocols = all
139 #
140 # The proxy_interfaces parameter specifies the network interfac
141 # addresses that this mail system receives mail on by way of a
142 # proxy or network address translation unit. This setting exten
143 # the address list specified with the inet_interfaces parameter
```

:183 → comment

:184 → uncomment

```
181 # SEE ALSO BELOW, SECTION "REJECTING MAIL FOR UNKNOWN LOCAL USERS".
182 #
183 #mydestination = $myhostname, localhost.$mydomain, localhost
184 mydestination = $myhostname, localhost.$mydomain, localhost, $mydomain
185 #mydestination = $myhostname, localhost.$mydomain, localhost, $mydomain,
186 #           mail.$mydomain, www.$mydomain, ftp.$mydomain
187
188 # REJECTING MAIL FOR UNKNOWN LOCAL USERS
```

:283 → uncomment and write (vhange value )

```
279 # You can also specify the absolute pathname of a pattern
280 # of listing the patterns here. Specify type:table for t
281 # (the value on the table right-hand side is not used).
282 #
283 mynetworks = 172.22.55.0/24, 127.0.0.0/8
284 #mynetworks = $config_directory/mynetworks
285 #mynetworks = hash:/etc/postfix/network_table
286
```

:438 → uncomment

```
#  
#home_mailbox = Mailbox  
#home_mailbox = Maildir/
```

Systemctl enable postfix

Systemctl start postfix

Systemctl status postfix

Yum install -y telnet

telnet localhost smtp

```
:  
-ehlo localhost
```

```
-mail from:<user1>      i.e first we created  
-rcpt to:<user2>        i.e.second user we created first  
-data  
- press . and then enter the back  
- quit
```

```
250-DSN  
250-SMTPUTF8  
250 CHUNKING  
mail from:<user1>  
250 2.1.0 Ok  
rcpt to:<user2>  
250 2.1.5 Ok  
data  
354 End data with <CR><LF>. <CR><LF>  
hi user2 ,  
how are you ?  
i am fine  
  
jeetu is teaching us good.  
its jeetus last day!!!!  
  
Regards  
user1(Aniket)  
.   
250 2.0.0 Ok: queued as CDB2728F5B67  
quit  
221 2.0.0 Bye  
Connection closed by foreign host.  
[root@server ~]#
```

```
Yum install -y dovecot
```

```
Cp /etc/dovecot/dovecote.conf /etc/dovecot/dovecote.conf-bkp
```

```
Vim /etc/dovecot/dovecote.conf
```

```
:24 → umcomment and remove submission
```

```
18 # or plugin settings are added by default, th
19 # Paths are also just examples with the real
20 # options. The paths listed here are for conf
21 # --sysconfdir=/etc --localstatedir=/var
22
23 # Protocols we want to be serving.
24 protocols = imap pop3 lmtp █
25
26 # A comma separated list of IPs or hosts wher
27 # "*" listens in all IPv4 interfaces, "::" li
28 # If you want to specify non-default ports or
```

```
Vim /etc/dovecot/conf.d/10-mail.conf
```

```
:24 → uncomment
```

```
21 #
22 # See doc/wiki/Variables.txt for full list. Some examples:
23 #
24 █ mail_location = maildir:~/Maildir
25 █   mail_location = mbox:~/mail:INBOX=/var/mail/%u
26 █   mail_location = mbox:/var/mail/%d/%n:INDEX=/var/indexes/%u
27 #
28 # <doc/wiki/MailLocation.txt>
29 #
30 #mail_location =
```

Vim /etc/dovecot/conf.d/10-auth.conf

:10 → uncomment

```
6 # SSL/TLS is used (LOGINDISABLED capability)
7 # matches the local IP (ie. you're connecting
8 # connection is considered secure and plain
9 # See also ssl=required setting.
10 disable_plaintext_auth = yes
11
12 # Authentication cache size (e.g. 10M). 0
13 # means no cache.
```

:100 → write login after plain

```
96 # space separated list of wanted authentication mechs
97 #     plain login digest-md5 cram-md5 ntlm rpa apop an
98 #     gss-spnego
99 # NOTE: See also disable_plaintext_auth setting.
100 auth_mechanisms = plain login
101
102 ##
103 ## Password and user databases
104 ##
```

Vim /etc/dovecot/conf.d/10-master.conf

:102 , 103 → uncomment and give value as postfix

```
100    unix_listener auth-userdb {
101        #mode = 0666
102        user = postfix
103        group = postfix
104    }
105
106    # Postfix smtp-auth
107    #unix_listener /var/spool/postfix,
```

**Systemctl enable dovecot**

**Systemctl start dovecot**

**Systemctl status dovecot**

**TO Check → :**

**telnet localhost pop3**

```
[root@server ~]#  
[root@server ~]# telnet localhost pop3  
Trying ::1...  
Connected to localhost.  
Escape character is '^]'.  
+OK Dovecot ready.  
user user2  
+OK  
pass  
-ERR [AUTH] Authentication failed.  
pass user2  
-ERR No username given.  
user user2  
+OK  
pass user2  
+OK Logged in.  
list  
+OK 1 messages:  
1 536  
.retr 1
```

```
.retr 1
+OK 536 octets
Return-Path: <user1@server.training.com>
X-Original-To: user2
Delivered-To: user2@server.training.com
Received: from localhost (localhost [IPv6:::1])
    by server.training.com (Postfix) with ESMTP id CDB2728F5B67
    for <user2>; Tue, 30 Sep 2025 09:11:20 +0530 (IST)
Message-Id: <20250930034201.CDB2728F5B67@server.training.com>
Date: Tue, 30 Sep 2025 09:11:20 +0530 (IST)
From: user1@server.training.com

hii user2 ,
how are you ?
i am fine

jeetu is teaching us good.
its jeetus last day!!!!!

Regards
user1(Aniket)

.
quit
+OK Logging out.
Connection closed by foreign host.
[root@server ~]#
```

Question:

**Cmd to connect from server to client :??**

Ssh root@172.22.55.60

```
[root@server ~]#  
[root@server ~]#  
[root@server ~]# ssh root@172.22.55.60  
root@172.22.55.60's password:  
Activate the web console with: systemctl enable --now cockpit.socket  
  
Last login: Mon Sep 29 17:33:00 2025 from 172.22.53.205  
[root@client ~]#  
[root@client ~]#
```

For close :

Exit

---

---

## FIREWALLL

---

---

```
Systemctl status firewalld  
Systemctl start firewalld  
Systemctl status firewalld  
Firewall-cmd --list-all  
Firewall-cmd --add-port=80/tcp --permanent  
Firewall-cmd --reload  
Firewall-cmd --list-all  
Firewall-cmd -- add-service=samba --permanent  
Firewall-cmd -- reload  
Firewall-cmd --list-all
```

u

**TIPS:**

---

- STOP AND DISABLE FIREWALL
- STOP AND DISABLE SELINUX
- ENSURE THAT YUM IS WORKING ON SERVER AS WELL AS CLIENT
- DELET ALL THE EXISTING PARTITION AND REBOOT THE SERVER  
AFTER DELETION
- ALWAYS CREATE A BACKUP FOR MEJOR CONFIGURATION FILES