Lab 1

1. Using Loop devices, create 4 PVs

- dd if=/dev/zero of=/tmp/disk1.img bs=1024 count=100000
- dd if=/dev/zero of=/tmp/disk2.img bs=1024 count=100000
- dd if=/dev/zero of=/tmp/disk3.img bs=1024 count=100000
- dd if=/dev/zero of=/tmp/disk4.img bs=1024 count=100000
- sudo losetup -f /tmp/disk1.img
- sudo losetup -f /tmp/disk2.img
- sudo losetup -f /tmp/disk3.img
- sudo losetup -f /tmp/disk4.img
- sudo pvcreate /dev/loop16
- sudo pvcreate /dev/loop17
- sudo pvcreate /dev/loop18
- sudo pvcreate /dev/loop19

```
omnia@Linuxx:~$ dd if=/dev/zero of=/tmp/disk1.img bs=1024 count=100000
100000+0 records in
100000+0 records out
102400000 bytes (102 MB, 98 MiB) copied, 0.845484 s, 121 MB/s
omnia@Linuxx:~$ dd if=/dev/zero of=/tmp/disk2.img bs=1024 count=100000
100000+0 records in
100000+0 records out
102400000 bytes (102 MB, 98 MiB) copied, 0.838372 s, 122 MB/s
omnia@Linuxx:~$ dd if=/dev/zero of=/tmp/disk3.img bs=1024 count=100000
100000+0 records in
100000+0 records out
102400000 bytes (102 MB, 98 MiB) copied, 0.855745 s, 120 MB/s
omnia@Linuxx:~$ dd if=/dev/zero of=/tmp/disk4.img bs=1024 count=100000
100000+0 records in
100000+0 records out
102400000 bytes (102 MB, 98 MiB) copied, 0.933493 s, 110 MB/s
```

```
omnia@Linuxx:~$ sudo losetup -f /tmp/disk1.img
[sudo] password for omnia:
omnia@Linuxx:~$ sudo losetup -f /tmp/disk2.img
omnia@Linuxx:~$ sudo losetup -f /tmp/disk3.img
omnia@Linuxx:~$ sudo losetup -f /tmp/disk4.img
```

```
omnia@Linuxx:~$ sudo pvcreate /dev/loop17
  Physical volume "/dev/loop17" successfully created.
omnia@Linuxx:~$ sudo pvcreate /dev/loop18
  Physical volume "/dev/loop18" successfully created.
omnia@Linuxx:~$ sudo pvcreate /dev/loop19
  Physical volume "/dev/loop19" successfully created.
```

2. Create VG and add 3 on PVs to it

```
omnia@Linuxx:~$ sudo vgcreate newVG /dev/loop17 /dev/loop18 /dev/loop19
  Volume group "newVG" successfully created
```

3. Create LV which has size of 250M

```
omnia@Linuxx:~$ sudo lvcreate -L 252M newVG
  Logical volume "lvol0" created.
```

4. Format LV using ext4

```
omnia@Linuxx:~$ sudo mkfs.ext4 /dev/newVG/lvol0
```

```
omnia@Linuxx:~$ sudo vgdisplay newVG
  --- Volume group ---
  VG Name               newVG
  System ID
  Format                lvm2
  Metadata Areas        3
  Metadata Sequence No  2
  VG Access             read/write
  VG Status             resizable
  MAX LV                0
  Cur LV                1
  Open LV               0
  Max PV                0
  Cur PV                3
  Act PV                3
  VG Size               288.00 MiB
  PE Size               4.00 MiB
  Total PE              72
  Alloc PE / Size       63 / 252.00 MiB
  Free  PE / Size       9 / 36.00 MiB
  VG UUID               40pOdW-Lhin-9Jqx-VBXk-HNA5-ygo8-0XYEfw
```

5. Mount LV into /mnt directory

```
omnia@Linuxx:~$ sudo mkdir /mnt/newlv
omnia@Linuxx:~$ sudo mount /dev/newVG/lvol0 /mnt/newlv
```

6. Extend VG with the remaining PV

```
omnia@Linuxx:~$ sudo vgextend newVG /dev/loop16
```

7. Extend LV with +50M

```
omnia@Linuxx:~$ sudo lvextend /dev/newVG/lvol0 -L +50M
  Rounding size to boundary between physical extents: 52.00 MiB.
```

8. Resize2fs LV with the +50M

```
omnia@Linuxx:~$ sudo unmount /dev/newVG/lvol0
omnia@Linuxx:~$ sudo e2fsck -f /dev/newVG/lvol0
e2fsck 1.46.5 (30-Dec-2021)
omnia@Linuxx:~$ sudo resize2fs /dev/newVG/lvol0 +50M
resize2fs 1.46.5 (30-Dec-2021)
```

9. Display the network interface information using ip command

```
omnia@Linuxx:~$ ip addr show
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group defaul
t 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
       valid_lft forever preferred_lft forever
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP gr
oup default qlen 1000
    link/ether 08:00:27:09:8d:66 brd ff:ff:ff:ff:ff:ff
    inet 10.0.2.15/24 brd 10.0.2.255 scope global dynamic noprefixroute enp0s3
       valid_lft 75738sec preferred_lft 75738sec
    inet6 fe80::bdc3:7c52:d6be:58aa/64 scope link noprefixroute
       valid_lft forever preferred_lft forever
```

10. Display currently active TCP connections on your OS using netstat command

```
omnia@Linuxx:~$ sudo apt install nmap
omnia@Linuxx:~$ sudo apt install net-tools
omnia@Linuxx:~$ netstat -t
Active Internet connections (w/o servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
omnia@Linuxx:~$ netstat -a
Active Internet connections (servers and established)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
tcp        0      0 localhost:domain        0.0.0.0:*               LISTEN
tcp        0      0 localhost:ipp           0.0.0.0:*               LISTEN
tcp6       0      0 ip6-localhost:ipp       [::]:*                  LISTEN
tcp6       0      0 [::]:http               [::]:*                  LISTEN
tcp6       0      0 [::]:https              [::]:*                  LISTEN
udp        0      0 0.0.0.0:631             0.0.0.0:*
ware       0      0 0.0.0.0:47999           0.0.0.0:*
           0      0 0.0.0.0:mdns            0.0.0.0:*
udp        0      0 localhost:domain        0.0.0.0:*
udp        0      0 Linuxx:bootpc           _gateway:bootps         ESTABLISHE
udp6       0      0 [::]:mdns               [::]:*
udp6       0      0 [::]:36493              [::]:*
raw6       0      0 [::]:ipv6-icmp          [::]:*                  7
Active UNIX domain sockets (servers and established)
```

11. Display currently open ports on your system using nmap command

```
omnia@Linuxx:~$ netstat -a -n | grep ESTABLISHED
udp        0      0 10.0.2.15:68            10.0.2.2:67             ESTABLISHED
```