Lab1

- Part1
    1. create 4 PVs create VG
    2. add 3 on PVs to it
    3. create LV which has size of 250M format LV using ext4
    4. mount LV into /mnt directory
    5. extend VG with the remaining PV
    6. extend LV with +50M resize2fs LV with the 50M extra

```
radwa@Ubunto:~/Desktop$ 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, 2.35245 s, 43.5 MB/s
radwa@Ubunto:~/Desktop$ 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, 2.08133 s, 49.2 MB/s
radwa@Ubunto:~/Desktop$ 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, 2.34978 s, 43.6 MB/s
radwa@Ubunto:~/Desktop$ 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, 2.12384 s, 48.2 MB/s
radwa@Ubunto:~/Desktop$ sudo losetup /dev/loop1 /tmp/disk1.img
losetup: /tmp/disk1.img: failed to set up loop device: Device or resource busy
radwa@Ubunto:~/Desktop$ sudo losetup /dev/loop1 /tmp/disk1.img
losetup: /tmp/disk1.img: failed to set up loop device: Device or resource busy
radwa@Ubunto:~/Desktop$ sudo losetup /dev/loop1 /tmp/disk1.img
losetup: /tmp/disk1.img: failed to set up loop device: Device or resource busy
radwa@Ubunto:~/Desktop$ sudo losetup -f /tmp/disk1.img
radwa@Ubunto:~/Desktop$ sudo losetup -f /tmp/disk2.img
radwa@Ubunto:~/Desktop$ sudo losetup -f /tmp/disk3.img
radwa@Ubunto:~/Desktop$ sudo losetup -f /tmp/disk4.img
radwa@Ubunto:~/Desktop$ sudo losetup
```

```
radwa@Ubunto:~/Desktop$ sudo pvcreate /dev/loop9
  Can't open /dev/loop9 exclusively.  Mounted filesystem?
  Can't open /dev/loop9 exclusively.  Mounted filesystem?
radwa@Ubunto:~/Desktop$ sudo pvcreate /dev/loop19
  Physical volume "/dev/loop19" successfully created.
radwa@Ubunto:~/Desktop$ sudo pvcreate /dev/loop21
  Physical volume "/dev/loop21" successfully created.
radwa@Ubunto:~/Desktop$ sudo pvcreate /dev/loop18
  Physical volume "/dev/loop18" successfully created.
radwa@Ubunto:~/Desktop$ sudo pvcreate /dev/loop21
  Physical volume "/dev/loop21" successfully created.
radwa@Ubunto:~/Desktop$ sudo pvcreate /dev/loop18
  Physical volume "/dev/loop18" successfully created.
radwa@Ubunto:~/Desktop$ sudo pvcreate /dev/loop20
  Physical volume "/dev/loop20" successfully created.
```

```
radwa@Ubunto:~/Desktop$ vgdisplay
  WARNING: Running as a non-root user. Functionality may be unavailable.
  /run/lock/lvm/P_global:aux: open failed: Permission denied
radwa@Ubunto:~/Desktop$ sudo vgdisplay
  --- Volume group ---
  VG Name               VG0
  System ID
  Format                lvm2
  Metadata Areas        3
  Metadata Sequence No  6
  VG Access             read/write
  VG Status             resizable
  MAX LV                0
  Cur LV                5
  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       71 / 284.00 MiB
  Free  PE / Size       1 / 4.00 MiB
  VG UUID               potbve-s8je-9Ph9-O8Ce-5uYd-oexb-4xy4pr

radwa@Ubunto:~/Desktop$ sudo mkfs.ext4 /dev/VG0/lvo10
mke2fs 1.46.5 (30-Dec-2021)
The file /dev/VG0/lvo10 does not exist and no size was specified.
radwa@Ubunto:~/Desktop$ sudo mkfs.ext4 /dev/VG0/lvol0
mke2fs 1.46.5 (30-Dec-2021)
Discarding device blocks: done
Creating filesystem with 64512 4k blocks and 64512 inodes
Filesystem UUID: 878d9a7f-74c7-4a7c-97ce-fad11ef00dab
Superblock backups stored on blocks:
        32768

Allocating group tables: done
Writing inode tables: done
Creating journal (4096 blocks): done
Writing superblocks and filesystem accounting information: done
```

```
radwa@Ubunto:~/Desktop$ sudo mkdir /mnt/lvol0
radwa@Ubunto:~/Desktop$ sudo mount /dev/VG0/lvol0 /mnt/lvol0
```

```
radwa@Ubunto:~/Desktop$ sudo vgextend VG0 /dev/loop20
  Volume group "VG0" successfully extended
```

```
radwa@Ubunto:~/Desktop$ sudo lvextend /dev/VG0/lvol0 -L +50M
  Rounding size to boundary between physical extents: 52.00 MiB.
  Size of logical volume VG0/lvol0 changed from 252.00 MiB (63 extents) to 304.0
0 MiB (76 extents).
  Logical volume VG0/lvol0 successfully resized.
```

```
radwa@Ubunto:~/Desktop$ sudo umount /dev/VG0/lvol0
radwa@Ubunto:~/Desktop$ sudo e2fsck -f /dev/VG0/lvol0
e2fsck 1.46.5 (30-Dec-2021)
Pass 1: Checking inodes, blocks, and sizes
Pass 2: Checking directory structure
Pass 3: Checking directory connectivity
Pass 4: Checking reference counts
Pass 5: Checking group summary information
/dev/VG0/lvol0: 11/64512 files (0.0% non-contiguous), 8204/64512 blocks
radwa@Ubunto:~/Desktop$ sudo resize2fs /dev/VG0/lvol0 +50M
resize2fs 1.46.5 (30-Dec-2021)
Resizing the filesystem on /dev/VG0/lvol0 to 12800 (4k) blocks.
The filesystem on /dev/VG0/lvol0 is now 12800 (4k) blocks long.
```

- Part2:
    1- Display the network interface information using ip command
    2- Display currently active TCP connections on your OS using netstatcommand
    3- Display currently open ports on your system using nmap command (install it using apt)

```
radwa@Ubunto:~/Desktop$ 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 08:00:27:85:dd:dc 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 86234sec preferred_lft 86234sec
    inet6 fe80::300a:7367:832:f463/64 scope link noprefixroute
       valid_lft forever preferred_lft forever
```

```
radwa@Ubunto:~/Desktop$ sudo apt install nmap
[sudo] password for radwa:
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following package was automatically installed and is no longer required:
  systemd-hwe-hwdb
Use 'sudo apt autoremove' to remove it.
The following additional packages will be installed:
  libblas3 liblinear4 lua-lpeg nmap-common
Suggested packages:
  liblinear-tools liblinear-dev ncat ndiff zenmap
The following NEW packages will be installed:
  libblas3 liblinear4 lua-lpeg nmap nmap-common
0 upgraded, 5 newly installed, 0 to remove and 193 not upgraded.
Need to get 5,972 kB of archives.
After this operation, 26.3 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://eg.archive.ubuntu.com/ubuntu jammy/main amd64 libblas3 amd64 3.10.0
-2ubuntu1 [228 kB]
Get:2 http://eg.archive.ubuntu.com/ubuntu jammy/universe amd64 liblinear4 amd64
2.3.0+dfsg-5 [41.4 kB]
Get:3 http://eg.archive.ubuntu.com/ubuntu jammy/universe amd64 lua-lpeg amd64 1.
0.2-1 [31.4 kB]
Get:4 http://eg.archive.ubuntu.com/ubuntu jammy/universe amd64 nmap-common all 7
.91+dfsg1+really7.80+dfsg1-2build1 [3,940 kB]
60% [4 nmap-common 3,257 kB/3,940 kB 83%]                        393 kB/s 6s
```

```
radwa@Ubunto:~/Desktop$ sudo apt install net-tools
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following package was automatically installed and is no longer required:
  systemd-hwe-hwdb
Use 'sudo apt autoremove' to remove it.
The following NEW packages will be installed:
  net-tools
0 upgraded, 1 newly installed, 0 to remove and 193 not upgraded.
Need to get 204 kB of archives.
After this operation, 819 kB of additional disk space will be used.
Get:1 http://eg.archive.ubuntu.com/ubuntu jammy/main amd64 net-tools amd64 1.60+
git20181103.0eebece-1ubuntu5 [204 kB]
Fetched 204 kB in 1s (284 kB/s)
Selecting previously unselected package net-tools.
(Reading database ... 231502 files and directories currently installed.)
Preparing to unpack .../net-tools_1.60+git20181103.0eebece-1ubuntu5_amd64.deb ..
.
Unpacking net-tools (1.60+git20181103.0eebece-1ubuntu5) ...
Setting up net-tools (1.60+git20181103.0eebece-1ubuntu5) ...
Processing triggers for man-db (2.10.2-1) ...
radwa@Ubunto:~/Desktop$ netstat -t
Active Internet connections (w/o servers)
Proto Recv-Q Send-Q Local Address          Foreign Address         State
tcp        0      0 10.0.2.15:34194        aerodent.canonical:http TIME_WAIT
```

```
radwa@Ubunto:~/Desktop$ netstat -a -n | grep ESTABLISHED
udp        0      0 10.0.2.15:68           10.0.2.2:67             ESTABLISHED
```