LAB 1

Using Loop devices, create 4 PVs

```
tahoun@tahoun-VirtualBox:/tmp$ dd if=/dev/zero of=disk0.disk bs=1024 count=100000
100000+0 records in
100000+0 records out
102400000 bytes (102 MB, 98 MiB) copied, 0.363967 s, 281 MB/s
tahoun@tahoun-VirtualBox:/tmp$ dd if=/dev/zero of=disk1.disk bs=1024 count=100000
100000+0 records in
100000+0 records out
102400000 bytes (102 MB, 98 MiB) copied, 0.366569 s, 279 MB/s
tahoun@tahoun-VirtualBox:/tmp$ dd if=/dev/zero of=disk2.disk bs=1024 count=100000
100000+0 records in
100000+0 records out
102400000 bytes (102 MB, 98 MiB) copied, 0.352151 s, 291 MB/s
tahoun@tahoun-VirtualBox:/tmp$ dd if=/dev/zero of=disk3.disk bs=1024 count=100000
100000+0 records in
100000+0 records out
102400000 bytes (102 MB, 98 MiB) copied, 0.35589 s, 288 MB/s
```

```
tahoun@tahoun-VirtualBox:/tmp$ sudo losetup -f
/dev/loop25
tahoun@tahoun-VirtualBox:/tmp$ sudo losetup /dev/loop25 disk0.disk
tahoun@tahoun-VirtualBox:/tmp$ sudo losetup /dev/loop26 disk1.disk
tahoun@tahoun-VirtualBox:/tmp$ sudo losetup /dev/loop27 disk2.disk
tahoun@tahoun-VirtualBox:/tmp$ sudo losetup /dev/loop28 disk3.disk
```

create VG and add 3 on PVs to it

```
tahoun@tahoun-VirtualBox:/tmp$ sudo vgcreate VG0 /dev/loop25 /dev/loop26 /dev/loop27
  Physical volume "/dev/loop25" successfully created.
  Physical volume "/dev/loop26" successfully created.
  Physical volume "/dev/loop27" successfully created.
  Volume group "VG0" successfully created
tahoun@tahoun-VirtualBox:/tmp$ sudo vgdisplay
  --- Volume group ---
  VG Name               VG0
  System ID
  Format                lvm2
  Metadata Areas        3
  Metadata Sequence No  1
  VG Access             read/write
  VG Status             resizable
  MAX LV                0
  Cur LV                0
  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       0 / 0
  Free  PE / Size       72 / 288.00 MiB
  VG UUID               NC28eT-h2Ue-cpqK-23F9-Luor-Mfck-d6VbzM
```

create LV which has size of 250M

```
tahoun@tahoun-VirtualBox:/tmp$ sudo lvcreate -L 250M -n LV0 VG0
  Rounding up size to full physical extent 252.00 MiB
  Logical volume "LV0" created.
```

format LV using ext4

```
tahoun@tahoun-VirtualBox:/tmp$ sudo mkfs.ext4 /dev/VG0/LV0
mke2fs 1.46.5 (30-Dec-2021)
Discarding device blocks: done
Creating filesystem with 64512 4k blocks and 64512 inodes
Filesystem UUID: 8730e404-4a2b-40e1-a364-081073fcd5ef
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
```

mount LV into /mnt directory

```
tahoun@tahoun-VirtualBox:/tmp$ sudo mount /dev/VG0/LV0 /mnt
```

extend VG with the remaining PV

```
tahoun@tahoun-VirtualBox:/tmp$ sudo vgextend VG0 /dev/loop28
  Physical volume "/dev/loop28" successfully created.
  Volume group "VG0" successfully extended
```

extend LV with +50M

```
tahoun@tahoun-VirtualBox:/tmp$ sudo lvextend /dev/VG0/LV0 -L +50M
  Rounding size to boundary between physical extents: 52.00 MiB.
  Size of logical volume VG0/LV0 changed from 252.00 MiB (63 extents) to 304.00 MiB (76 extents).
  Logical volume VG0/LV0 successfully resized.
```

resize2fs LV with the 50M extra

```
tahoun@tahoun-VirtualBox:/tmp$ sudo umount /dev/VG0/LV0
tahoun@tahoun-VirtualBox:/tmp$ sudo resize2fs /dev/VG0/LV0 +50M
resize2fs 1.46.5 (30-Dec-2021)
Please run 'e2fsck -f /dev/VG0/LV0' first.

tahoun@tahoun-VirtualBox:/tmp$ sudo e2fsck -f /dev/VG0/LV0
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/LV0: 11/64512 files (0.0% non-contiguous), 8204/64512 blocks
tahoun@tahoun-VirtualBox:/tmp$ sudo resize2fs /dev/VG0/LV0 +50M
resize2fs 1.46.5 (30-Dec-2021)
Resizing the filesystem on /dev/VG0/LV0 to 12800 (4k) blocks.
The filesystem on /dev/VG0/LV0 is now 12800 (4k) blocks long.
```

NETWORK

Display the network interface information using `ip` command

```
tahoun@tahoun-VirtualBox:~$ ip add show
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
       valid_lft forever preferred_lft forever
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 08:00:27:c4:ba:5b 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 72815sec preferred_lft 72815sec
    inet6 fe80::abe4:c185:8a8e:3130/64 scope link noprefixroute
       valid_lft forever preferred_lft forever
```

Display currently active TCP connections on your OS using `netstat` command

```
Processing triggers for ttbe-bin (2.33 oubuntu3.1) ...
tahoun@tahoun-VirtualBox:~$ netstat -t
Active Internet connections (w/o servers)
Proto Recv-Q Send-Q Local Address          Foreign Address          State
tahoun@tahoun-VirtualBox:~$
```

```
tahoun@tahoun-VirtualBox:~$ netstat -atp
(Not all processes could be identified, non-owned process info
 will not be shown, you would have to be root to see it all.)
Active Internet connections (servers and established)
Proto Recv-Q Send-Q Local Address          Foreign Address          State       PID/Program name
tcp        0      0 localhost:domain       0.0.0.0:*                LISTEN      -
tcp        0      0 localhost:ipp          0.0.0.0:*                LISTEN      -
tcp6       0      0 [::]:http              [::]:*                   LISTEN      -
tcp6       0      0 ip6-localhost:ipp      [::]:*                   LISTEN      -
```

Display currently open ports on your system using `nmap` command (install it using apt)

```
tahoun@tahoun-VirtualBox:~$ nmap 192.168.1.1
Starting Nmap 7.80 ( https://nmap.org ) at 2023-03-28 17:20 EET
Nmap scan report for 192.168.1.1
Host is up (0.0064s latency).
Not shown: 997 filtered ports
PORT     STATE SERVICE
53/tcp   open  domain
80/tcp   open  http
443/tcp open  https

Nmap done: 1 IP address (1 host up) scanned in 4.90 seconds
```