

## **Lab1 Objectives:**

### **1. Using Loop devices, create 4 PVs**

- command:

- 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.im
  
- sudo pvcreate /dev/loop16
- sudo pvcreate /dev/loop17
- sudo pvcreate /dev/loop18
- sudo pvcreate /dev/loop19

- screen shot:

```
mariam@mariam-VirtualBox:~/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, 1.91752 s, 53.4 MB/s
```

```
mariam@mariam-VirtualBox:~/Desktop$ sudo losetup -f /tmp/disk1.img
mariam@mariam-VirtualBox:~/Desktop$ sudo losetup -f /tmp/disk2.img
mariam@mariam-VirtualBox:~/Desktop$ sudo losetup -f /tmp/disk3.img
mariam@mariam-VirtualBox:~/Desktop$ sudo losetup -f /tmp/disk4.img
```

```
mariam@mariam-VirtualBox:~/Desktop$ sudo pvcreate /dev/loop16
Physical volume "/dev/loop16" successfully created.
mariam@mariam-VirtualBox:~/Desktop$ sudo pvcreate /dev/loop17
Physical volume "/dev/loop17" successfully created.
mariam@mariam-VirtualBox:~/Desktop$ sudo pvcreate /dev/loop18
Physical volume "/dev/loop18" successfully created.
mariam@mariam-VirtualBox:~/Desktop$ sudo pvcreate /dev/loop19
Physical volume "/dev/loop19" successfully created.
```

## 2. create VG and add 3 on PVs to it

- commands:
  - `sudo vgcreate VG1 /dev/loop16 /dev/loop17 /dev/loop18`
- screen shot:

```
mariam@mariam-VirtualBox:~/Desktop$ sudo vgcreate VG1 /dev/loop16 /dev/loop17 /dev/loop18
Volume group "VG1" successfully created
```

## 3. create LV which has size of 250M

- commands:
  - `sudo lvcreate -L 250M VG1`
- screen shot:

```
mariam@mariam-VirtualBox:~/Desktop$ sudo lvcreate -L 250M VG1
Rounding up size to full physical extent 252.00 MiB
Logical volume "lvol0" created.
```

## 4. format LV using ext4

- commands:
  - `sudo mkfs.ext4 /dev/VG1/lvol0`
- screen shot:

```
mariam@mariam-VirtualBox:~/Desktop$ sudo mkfs.ext4 /dev/VG1/lvol0
mke2fs 1.46.5 (30-Dec-2021)
Discarding device blocks: done
Creating filesystem with 64512 4k blocks and 64512 inodes
Filesystem UUID: 9591a919-7720-4298-bfd3-f1825f6002df
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
```

### 5. mount LV into /mnt directory

- commands:
  - `sudo mount /dev/VG1/lvol0 /mnt`
- screen shot:

```
mariam@mariam-VirtualBox:~/Desktop$ sudo mount /dev/VG1/lvol0 /mnt
```

### 6. extend VG with the remaining PV

- commands:
  - `sudo vgextend VG1 /dev/loop19`
- screen shot:

```
mariam@mariam-VirtualBox:~/Desktop$ sudo vgextend VG1 /dev/loop19
Volume group "VG1" successfully extended
```

### 7. extend LV with +50M

- commands:
  - `sudo lvextend /dev/VG1/lvol0 -L 50M`
- screen shot:

```
mariam@mariam-VirtualBox:~/Desktop$ sudo lvextend /dev/VG1/lvol0 -L 50M
Rounding size to boundary between physical extents: 52.00 MiB.
New size given (13 extents) not larger than existing size (63 extents)
```

### 8. resize2fs LV with the 50M extra

- commands:
  - `sudo umount /dev/VG1/lvol0`
  - `sudo e2fsck -f /dev/VG1/lvol0`
  - `sudo resize2fs /dev/VG1/lvol0 50M`
- screen shot:

```

mariam@mariam-VirtualBox:~/Desktop$ sudo umount /dev/VG1/lvol0
mariam@mariam-VirtualBox:~/Desktop$ sudo resize2fs /dev/VG1/lvol0 50M
resize2fs 1.46.5 (30-Dec-2021)
Please run 'e2fsck -f /dev/VG1/lvol0' first.

mariam@mariam-VirtualBox:~/Desktop$ sudo e2fsck -f /dev/VG1/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/VG1/lvol0: 11/64512 files (0.0% non-contiguous), 8204/64512 blocks
mariam@mariam-VirtualBox:~/Desktop$ sudo resize2fs /dev/VG1/lvol0 50M
resize2fs 1.46.5 (30-Dec-2021)
Resizing the filesystem on /dev/VG1/lvol0 to 12800 (4k) blocks.
The filesystem on /dev/VG1/lvol0 is now 12800 (4k) blocks long.

```

## 9. Display the network interface information using ip command

- commands:
  - ip address
- screen shot:

```

mariam@mariam-VirtualBox:~/Desktop$ ip add
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 08:00:27:70:1d:ff 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 83442sec preferred_lft 83442sec
    inet6 fe80::18ad:7fe4:2c72:b3e8/64 scope link noprefixroute
        valid_lft forever preferred_lft forever

```

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

- commands:
  - sudo apt install net-tools
  - netstat -t
- screen shot:

```

mariam@mariam-VirtualBox:~/Desktop$ netstat -t
Active Internet connections (w/o servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
tcp      0      0 mariam-VirtualBox:33928 196.204.4.16:http      ESTABLISHED
tcp      0      0 mariam-VirtualBox:57034 mrs08s20-in-f13.1:https TIME_WAIT
tcp      0      0 mariam-VirtualBox:52820 150.9.241.35.bc.g:https ESTABLISHED
tcp      0      0 mariam-VirtualBox:49338 36.75.98.34.bc.go:https ESTABLISHED
tcp      0      0 mariam-VirtualBox:38646 21.103.201.35.bc.:https ESTABLISHED
tcp      0      0 mariam-VirtualBox:58638 mrs08s19-in-f4.1e:https TIME_WAIT
tcp      0      0 mariam-VirtualBox:38354 192.229.221.95:http    ESTABLISHED
tcp      0      0 mariam-VirtualBox:42854 191.144.160.34.bc:https ESTABLISHED
tcp      0      0 mariam-VirtualBox:59532 mrs08s21-in-f10.1:https TIME_WAIT
tcp      0      0 mariam-VirtualBox:47006 17.111.232.35.bc.g:http TIME_WAIT
tcp      0      0 mariam-VirtualBox:49962 123.208.120.34.bc:https ESTABLISHED
tcp      0      0 mariam-VirtualBox:35426 mrs08s19-in-f10.1:https TIME_WAIT
tcp      0      0 mariam-VirtualBox:53274 82.221.107.34.bc.g:http ESTABLISHED
tcp      0      0 mariam-VirtualBox:47568 a92-122-225-225.de:http ESTABLISHED
tcp      0      0 mariam-VirtualBox:47744 mrs09s15-in-f14.1:https TIME_WAIT

```

# 11. Display currently open ports on your system using nmap command (install it using apt)

- commands:
  - `sudo apt install nmap`
  - `nmap 192.168.1.1`
- screen shot:

```

mariam@mariam-VirtualBox:~/Desktop$ nmap 192.168.1.1
Starting Nmap 7.80 ( https://nmap.org ) at 2023-03-28 14:26 EET
Nmap scan report for 192.168.1.1
Host is up (0.027s latency).
Not shown: 997 filtered ports
PORT      STATE SERVICE
53/tcp    open  domain
80/tcp    open  http
443/tcp   open  https

```