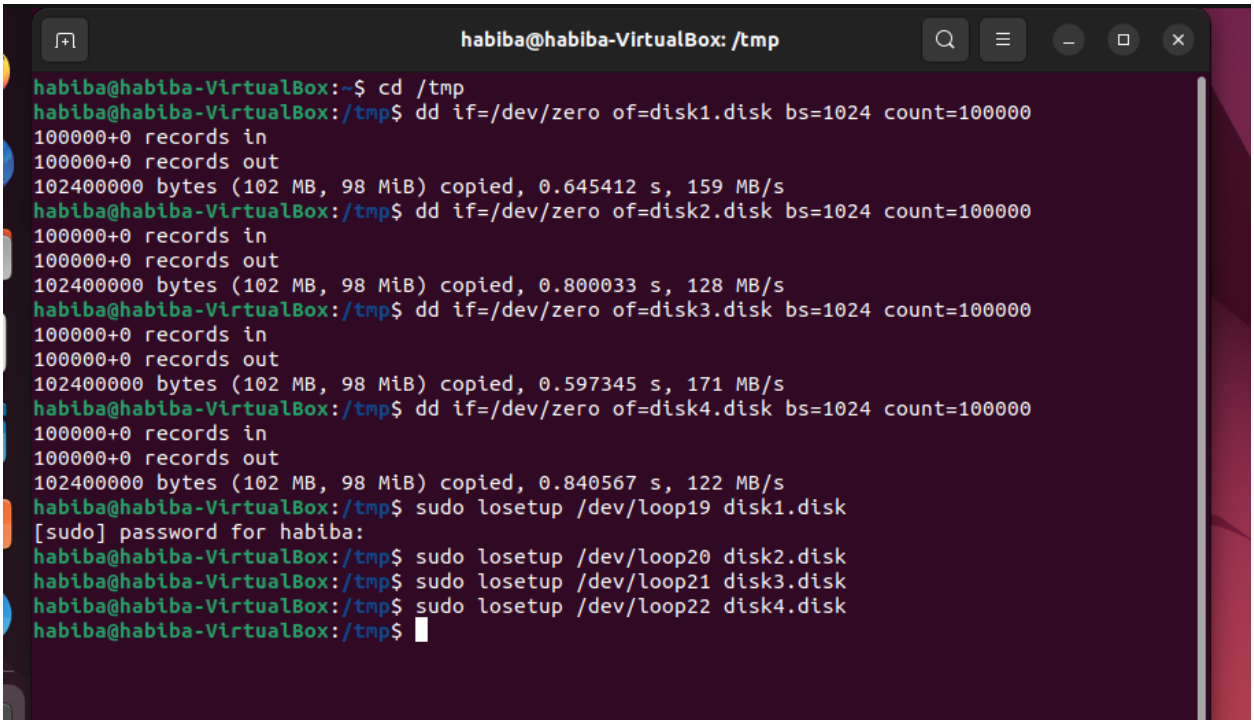
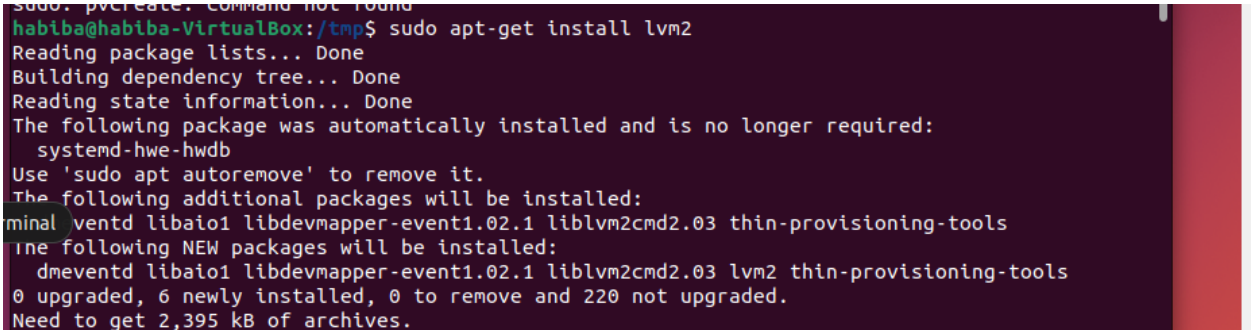
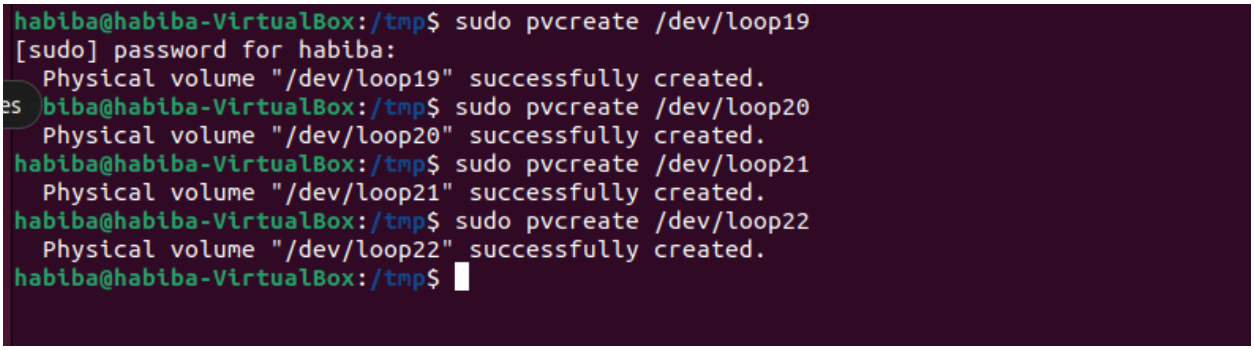
Lab1 System Admin2

- Using Loop devices, create 4 PVs



- create VG and add 3 on PVs to it





- create LV which has size of 250M

```
habiba@habiba-VirtualBox:/tmp$ sudo vgcreate VG1 /dev/loop19 /dev/loop20 /dev/loop21
  Volume group "VG1" successfully created
habiba@habiba-VirtualBox:/tmp$ sudo lvcreate -L 250M VG1
  Rounding up size to full physical extent 252.00 MiB
  Logical volume "lvol0" created.
habiba@habiba-VirtualBox:/tmp$ sudo lvdisplay
  --- Logical volume ---
  LV Path                /dev/VG1/lvol0
  LV Name                lvol0
  VG Name                VG1
  LV UUID                HMSocF-Mi8G-0IuF-cD7X-tnEf-sCGX-a7IDfj
  LV Write Access        read/write
  LV Creation host, time habiba-VirtualBox, 2023-04-01 03:15:19 +0200
  LV Status              available
  # open                 0
  LV Size                252.00 MiB
  Current LE             63
  Segments               3
  Allocation             inherit
  Read ahead sectors     auto
  - currently set to     256
  Block device           253:0
```

- format LV using ext4

```
habiba@habiba-VirtualBox:/tmp$ 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: 965b9db4-6631-4ae3-98bd-ed76aa08371b
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

```
habiba@habiba-VirtualBox:/tmp$ sudo mount /dev/VG1/lvol0 /mnt
habiba@habiba-VirtualBox:/tmp$ sudo df -h /mnt
Filesystem             Size  Used Avail Use% Mounted on
/dev/mapper/VG1-lvol0  220M   24K  203M   1% /mnt
```

- extend VG with the remaining PV

```
habiba@habiba-VirtualBox:/tmp$ sudo vgextend VG1 /dev/loop22
  Volume group "VG1" successfully extended
habiba@habiba-VirtualBox:/tmp$
```

- extend LV with +50M

```
habiba@habiba-VirtualBox:/tmp$ sudo lvextend /dev/VG1/lvol0 -L +50M
  Rounding size to boundary between physical extents: 52.00 MiB.
  Size of logical volume VG1/lvol0 changed from 252.00 MiB (63 extents) to 304.00
nts).
  Logical volume VG1/lvol0 successfully resized.
```

- resize2fs LV with the 50M extra

```
habiba@habiba-VirtualBox:/tmp$ sudo umount /dev/VG1/lvol0
habiba@habiba-VirtualBox:/tmp$ 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
habiba@habiba-VirtualBox:/tmp$ 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.
```

Network:

- Display the network interface information using `ip` command

```
habiba@habiba-VirtualBox:/tmp$ ip a
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 ql
en 1000
    link/ether 08:00:27:bc:bb:0d 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 55666sec preferred_lft 55666sec
    inet6 fe80::443b:eac5:b21d:d7de/64 scope link noprefixroute
       valid_lft forever preferred_lft forever
```

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

```
habiba@habiba-VirtualBox:/tmp$ sudo apt install nmap
[sudo] password for habiba:
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
habiba@habiba-VirtualBox:/tmp$ 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 long
```

```
habiba@habiba-VirtualBox:/tmp$ netstat -t
Active Internet connections (w/o servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
habiba@habiba-VirtualBox:/tmp$ netstat -a
Active Internet connections (servers and established)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
tcp        0      0 localhost:ipp           0.0.0.0:*               LISTEN
tcp        0      0 localhost:domain        0.0.0.0:*               LISTEN
tcp6       0      0 [::]:http               [::]:*                  LISTEN
tcp6       0      0 ip6-localhost:ipp       [::]:*                  LISTEN
udp        0      0 0.0.0.0:mdns            0.0.0.0:*
udp        0      0 localhost:domain        0.0.0.0:*
udp        0      0 10.0.2.15:bootpc        10.0.2.2:bootps         ESTABLISHED
udp        0      0 0.0.0.0:631             0.0.0.0:*
udp        0      0 0.0.0.0:34690           0.0.0.0:*
udp6       0      0 [::]:mdns               [::]:*
udp6       0      0 [::]:34316              [::]:*
raw6       0      0 [::]:ipv6-icmp          [::]:*                  7
Active UNIX domain sockets (servers and established)
```

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

```
habiba@habiba-VirtualBox:/tmp$ nmap 192.168.1.50
Starting Nmap 7.80 ( https://nmap.org ) at 2023-04-01 04:50 EET
Note: Host seems down. If it is really up, but blocking our ping probes, try -Pn
Nmap done: 1 IP address (0 hosts up) scanned in 3.12 seconds
habiba@habiba-VirtualBox:/tmp$
```