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Lab1/System Admin II

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

```
raneen@raneen-VirtualBox:~$ cd/tmp
bash: cd/tmp: No such file or directory
raneen@raneen-VirtualBox:~$ cd /tmp
raneen@raneen-VirtualBox:/tmp$ dd if=/dev/zero of=disk1.disk bs=1.24 count=1000
00
dd: invalid number: '1.24'
raneen@raneen-VirtualBox:/tmp$ dd if=/dev/zero of=disk1.disk bs=1024 count=1000
00
100000+0 records in
100000+0 records out
102400000 bytes (102 MB, 98 MiB) copied, 0.51988 s, 197 MB/s
raneen@raneen-VirtualBox:/tmp$ dd if=/dev/zero of=disk2.disk bs=1024 count=1000
00
100000+0 records in
100000+0 records out
102400000 bytes (102 MB, 98 MiB) copied, 0.341007 s, 300 MB/s
raneen@raneen-VirtualBox:/tmp$ dd if=/dev/zero of=disk3.disk bs=1024 count=1000
00
100000+0 records in
100000+0 records out
102400000 bytes (102 MB, 98 MiB) copied, 0.335115 s, 306 MB/s
raneen@raneen-VirtualBox:/tmp$ dd if=/dev/zero of=disk4.disk bs=1024 count=1000
00
100000+0 records in
100000+0 records out
102400000 bytes (102 MB, 98 MiB) copied, 0.350215 s, 292 MB/s
raneen@raneen-VirtualBox:/tmp$
```

Delete All loops

```
raneen@raneen-VirtualBox:~$ sudo losetup -d /dev/loop17
raneen@raneen-VirtualBox:~$ sudo losetup -d /dev/loop18
raneen@raneen-VirtualBox:~$ sudo losetup -d /dev/loop19
raneen@raneen-VirtualBox:~$ sudo losetup -d /dev/loop20
raneen@raneen-VirtualBox:~$ sudo losetup
NAME SIZELIMIT OFFSET AUTOCLEAR RO BACK-FILE                         DIO LOG-SEC
/dev/loop1
            0        0         1  1 /var/lib/snapd/snaps/bare_5.snap   0     512
/dev/loop8
            0        0         1  1 /var/lib/snapd/snaps/snap-store_582.snap
                                                                      0     512
/dev/loop15
            0        0         1  1 /var/lib/snapd/snaps/snapd-desktop-integrati
on_57.snap
                                                                      0     512
/dev/loop6
            0        0         1  1 /var/lib/snapd/snaps/gnome-3-38-2004_119.sna
p
                                                                      0     512
/dev/loop13
```

```
raneen@raneen-VirtualBox:/tmp$ sudo losetup -f
/dev/loop11
raneen@raneen-VirtualBox:/tmp$ sudo losetup -f /tmp/disk1.disk
raneen@raneen-VirtualBox:/tmp$ sudo losetup -f /tmp/disk2.disk
raneen@raneen-VirtualBox:/tmp$ sudo losetup -f /tmp/disk3.disk
raneen@raneen-VirtualBox:/tmp$ sudo losetup -f /tmp/disk4.disk
raneen@raneen-VirtualBox:/tmp$ sudo losetup | grep tmp
/dev/loop19         0         0         0  0 /tmp/disk4.disk
                    0       512
/dev/loop17         0         0         0  0 /tmp/disk2.disk
                    0       512
/dev/loop11         0         0         0  0 /tmp/disk1.disk
                    0       512
/dev/loop18         0         0         0  0 /tmp/disk3.disk
                    0       512
raneen@raneen-VirtualBox:/tmp$
```

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

```
raneen@raneen-VirtualBox:/tmp$ sudo apt install lvm2
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:
  dmeventd libaio1 libdevmapper-event1.02.1 liblvm2cmd2.03
  thin-provisioning-tools
The following NEW packages will be installed:
  dmeventd libaio1 libdevmapper-event1.02.1 liblvm2cmd2.03 lvm2
  thin-provisioning-tools
0 upgraded, 6 newly installed, 0 to remove and 197 not upgraded.
Need to get 2,395 kB of archives.
After this operation, 8,959 kB 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 libaio1 amd64 0.3.11
2-13build1 [7,176 B]
Get:2 http://eg.archive.ubuntu.com/ubuntu jammy/main amd64 libdevmapper-event1.
02.1 amd64 2:1.02.175-2.1ubuntu4 [12.6 kB]
Get:3 http://eg.archive.ubuntu.com/ubuntu jammy/main amd64 liblvm2cmd2.03 amd64
 2.03.11-2.1ubuntu4 [756 kB]
Get:4 http://eg.archive.ubuntu.com/ubuntu jammy/main amd64 dmeventd amd64 2:1.0
2.175-2.1ubuntu4 [38.4 kB]
Get:5 http://eg.archive.ubuntu.com/ubuntu jammy/main amd64 lvm2 amd64 2.03.11-2
.1ubuntu4 [1,154 kB]
Get:6 http://eg.archive.ubuntu.com/ubuntu jammy/main amd64 thin-provisioning-to
```

```
raneen@raneen-VirtualBox:/tmp$ sudo pvcreate /dev/loop19
  Physical volume "/dev/loop19" successfully created.
raneen@raneen-VirtualBox:/tmp$ sudo pvcreate /dev/loop17
  Physical volume "/dev/loop17" successfully created.
raneen@raneen-VirtualBox:/tmp$ sudo pvcreate /dev/loop11
  Physical volume "/dev/loop11" successfully created.
raneen@raneen-VirtualBox:/tmp$ sudo pvcreate /dev/loop18
  Physical volume "/dev/loop18" successfully created.
raneen@raneen-VirtualBox:/tmp$
```

```
raneen@raneen-VirtualBox:/tmp$ sudo vgcreate VG1 /dev/loop17 /dev/loop18 /dev/l
oop19
  Volume group "VG1" successfully created
raneen@raneen-VirtualBox:/tmp$
```

3) create LV which has size of 250M.

```
raneen@raneen-VirtualBox:/tmp$ sudo lvcreate -L 250M VG1
  Rounding up size to full physical extent 252.00 MiB
  Logical volume "lvol0" created.
raneen@raneen-VirtualBox:/tmp$ sudo lvdisplay
  --- Logical volume ---
  LV Path                /dev/VG1/lvol0
  LV Name                lvol0
  VG Name                VG1
  LV UUID                als4iS-ypvr-1Iav-bftR-pWeH-wnYd-5fzIIF
  LV Write Access        read/write
  LV Creation host, time raneen-VirtualBox, 2023-03-29 04:22:26 +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

raneen@raneen-VirtualBox:/tmp$
```

4) format LV using ext4.

```
raneen@raneen-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: 3c05c165-450b-4737-979d-0a1353b1d0c3
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.

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

6) extend VG with the remaining PV.

```
raneen@raneen-VirtualBox:/tmp$ lvextend -l +50M /dev/VG1/lvol0
  WARNING: Running as a non-root user. Functionality may be unavailable.
  Invalid argument for --extents: +50M
  Error during parsing of command line.
```

7) extend LV with +50M.

```
raneen@raneen-VirtualBox:/tmp$ sudo lvextend -L +50M /dev/VG1/lvol0
  Rounding size to boundary between physical extents: 52.00 MiB.
  Insufficient free space: 13 extents needed, but only 9 available
raneen@raneen-VirtualBox:/tmp$ sudo lvextend -L +20M /dev/VG1/lvol0
  Size of logical volume VG1/lvol0 changed from 252.00 MiB (63 extents) to 272.
00 MiB (68 extents).
  Logical volume VG1/lvol0 successfully resized.
```

8) resize2fs LV with the 50M extra.

```
raneen@raneen-VirtualBox:/tmp$ sudo resize2fs /dev/VG1/lvol0 +20M
resize2fs 1.46.5 (30-Dec-2021)
resize2fs: New size smaller than minimum (8217)

raneen@raneen-VirtualBox:/tmp$ sudo lvdisplay
  --- Logical volume ---
  LV Path                /dev/VG1/lvol0
  LV Name                lvol0
  VG Name                VG1
  LV UUID                als4iS-ypvr-1Iav-bftR-pWeH-wnYd-5fzIIF
  LV Write Access        read/write
  LV Creation host, time raneen-VirtualBox, 2023-03-29 04:22:26 +0200
  LV Status              available
  # open                 1
  LV Size                272.00 MiB
  Current LE             68
  Segments               3
  Allocation             inherit
  Read ahead sectors     auto
  - currently set to     256
  Block device           253:0
```

9) Display the network interface information using ip command.

```
raneen@raneen-VirtualBox:/tmp$ ip addr
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group defau
lt 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 g
roup default qlen 1000
    link/ether 08:00:27:be:04:f0 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 76071sec preferred_lft 76071sec
    inet6 fe80::f98e:c465:86a6:1db6/64 scope link noprefixroute
       valid_lft forever preferred_lft forever
```

10) Display currently active TCP connections on your OS using netstatcommand.

```
raneen@raneen-VirtualBox:/tmp$ sudo apt install net-tools
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following NEW packages will be installed:
  net-tools
0 upgraded, 1 newly installed, 0 to remove and 197 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 2s (115 kB/s)
Selecting previously unselected package net-tools.
(Reading database ... 197898 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) ...
raneen@raneen-VirtualBox:/tmp$
```

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

```
raneen@raneen-VirtualBox:/tmp$ snap install nmap # version 7.93
nmap 7.93 from Maximiliano Bertacchini (maxiberta) installed
raneen@raneen-VirtualBox:/tmp$ nmap 10.0.2.15
Starting Nmap 7.93 ( https://nmap.org ) at 2023-03-29 04:47 EET
Nmap scan report for 10.0.2.15 (10.0.2.15)
Host is up (0.000075s latency).
All 1000 scanned ports on 10.0.2.15 (10.0.2.15) are in ignored states.
Not shown: 1000 closed tcp ports (conn-refused)

Nmap done: 1 IP address (1 host up) scanned in 0.12 seconds
raneen@raneen-VirtualBox:/tmp$
```