Linux Day 5 Notes

❖ Simple Disk Partitioning (SDP):

Steps for SDP

1. Add the disk to the linux

```
[root@svr ~]# lsblk
NAME            MAJ:MIN RM  SIZE RO TYPE MOUNTPOINT
sda               8:0    0   30G  0 disk
├─sda1            8:1    0    1G  0 part /boot
└─sda2            8:2    0   29G  0 part
  ├─centos-root 253:0    0   26G  0 lvm  /
  └─centos-swap 253:1    0    3G  0 lvm  [SWAP]
sdb               8:16   0    5G  0 disk
sr0              11:0    1 4.4G  0 rom  /run/media/root/CentOS 7 x86_64
```

2. Create the partition
   - use fdisk command

```
[root@svr ~]# fdisk /dev/sdb
Welcome to fdisk (util-linux 2.23.2).

Changes will remain in memory only, until you decide to write them.
Be careful before using the write command.

Device does not contain a recognized partition table
Building a new DOS disklabel with disk identifier 0xe327c4e3.

Command (m for help): m
Command action
   a   toggle a bootable flag
   b   edit bsd disklabel
   c   toggle the dos compatibility flag
   d   delete a partition
   g   create a new empty GPT partition table
   G   create an IRIX (SGI) partition table
   l   list known partition types
   m   print this menu
   n   add a new partition
   o   create a new empty DOS partition table
   p   print the partition table
   q   quit without saving changes
   s   create a new empty Sun disklabel
   t   change a partition's system id
   u   change display/entry units
   v   verify the partition table
   w   write table to disk and exit
   x   extra functionality (experts only)

Command (m for help): n
```

```
Command (m for help): n
Partition type:
   p   primary (0 primary, 0 extended, 4 free)
   e   extended
Select (default p): p
Partition number (1-4, default 1): 1
First sector (2048-10485759, default 2048):
Using default value 2048
Last sector, +sectors or +size{K,M,G} (2048-10485759, default 10485759):
Using default value 10485759
Partition 1 of type Linux and of size 5 GiB is set

Command (m for help): w
The partition table has been altered!

Calling ioctl() to re-read partition table.
Syncing disks.
```

```
[root@svr ~]# lsblk
NAME            MAJ:MIN RM  SIZE RO TYPE MOUNTPOINT
sda               8:0    0   30G  0 disk
├─sda1            8:1    0    1G  0 part /boot
└─sda2            8:2    0   29G  0 part
  ├─centos-root 253:0    0   26G  0 lvm  /
  └─centos-swap 253:1    0    3G  0 lvm  [SWAP]
sdb               8:16   0    5G  0 disk
└─sdb1            8:17   0    5G  0 part
sr0              11:0    1 4.4G  0 rom  /run/media/root/CentOS 7 x86_64
[root@svr ~]#
```

3. Create the mount point
   # mkdir /stdpart

```
[root@svr ~]# mkdir /stdpart
[root@svr ~]#
[root@svr ~]# df -h
Filesystem               Size  Used Avail Use% Mounted on
devtmpfs                 1.9G     0  1.9G   0% /dev
tmpfs                    1.9G     0  1.9G   0% /dev/shm
tmpfs                    1.9G   13M  1.9G   1% /run
tmpfs                    1.9G     0  1.9G   0% /sys/fs/cgroup
/dev/mapper/centos-root   26G  7.3G   19G  28% /
/dev/sda1               1014M  187M  828M  19% /boot
tmpfs                    378M   28K  378M   1% /run/user/0
/dev/sr0                 4.4G  4.4G     0 100% /run/media/root/CentOS 7 x86_64
[root@svr ~]#
```

4. Create the file system
   #mkfs.xfs /dev/sdb1

```
[root@svr ~]# mkfs.xfs /dev/sdb1
meta-data=/dev/sdb1              isize=512    agcount=4, agsize=327616 blks
         =                       sectsz=512   attr=2, projid32bit=1
         =                       crc=1        finobt=0, sparse=0
data     =                       bsize=4096   blocks=1310464, imaxpct=25
         =                       sunit=0      swidth=0 blks
naming   =version 2              bsize=4096   ascii-ci=0 ftype=1
log      =internal log           bsize=4096   blocks=2560, version=2
         =                       sectsz=512   sunit=0 blks, lazy-count=1
realtime =none                   extsz=4096   blocks=0, rtextents=0
[root@svr ~]#
```

5. Mount the partition & verify.
   1. Temporary
      # mount <what-to-mount> <where-to-mount>
      # mount /dev/sdb1 /stdpart

```
[root@svr ~]# mount /dev/sdb1 /stdpart
[root@svr ~]# df -h
Filesystem               Size  Used Avail Use% Mounted on
devtmpfs                 1.9G     0  1.9G   0% /dev
tmpfs                    1.9G     0  1.9G   0% /dev/shm
tmpfs                    1.9G   13M  1.9G   1% /run
tmpfs                    1.9G     0  1.9G   0% /sys/fs/cgroup
/dev/mapper/centos-root   26G  7.3G   19G  28% /
/dev/sda1               1014M  187M  828M  19% /boot
tmpfs                    378M   28K  378M   1% /run/user/0
/dev/sr0                 4.4G  4.4G     0 100% /run/media/root/CentOS 7 x86_64
/dev/sdb1                5.0G   33M  5.0G   1% /stdpart
[root@svr ~]#
```

TO Unmount the Temporary partition either we can restart the VM or :

```
[root@svr stdpart]# cd
[root@svr ~]# umount /stdpart
[root@svr ~]# df -h
Filesystem               Size  Used Avail Use% Mounted on
devtmpfs                 1.9G     0  1.9G   0% /dev
tmpfs                    1.9G     0  1.9G   0% /dev/shm
tmpfs                    1.9G   13M  1.9G   1% /run
tmpfs                    1.9G     0  1.9G   0% /sys/fs/cgroup
/dev/mapper/centos-root   26G  7.3G   19G  28% /
/dev/sda1               1014M  187M  828M  19% /boot
tmpfs                    378M   28K  378M   1% /run/user/0
/dev/sr0                 4.4G  4.4G     0 100% /run/media/root/CentOS 7 x86_64
[root@svr ~]#
```

2. permanent

vim /etc/fstab

(Press 'O' to edit from next line)

1. <what-to-mount> /dev/sdb1
2. <where-to-mount> /stdpart
3. file system xfs
4. <options-to-mount> defaults
5. backup operation 0
6. file system check 0

```
 1
 2 #
 3 # /etc/fstab
 4 # Created by anaconda on Fri Apr 19 14:18:23 2024
 5 #
 6 # Accessible filesystems, by reference, are maintained under '/dev/disk'
 7 # See man pages fstab(5), findfs(8), mount(8) and/or blkid(8) for more info
 8 #
 9 /dev/mapper/centos-root /                       xfs     defaults        0 0
10 UUID=54721f31-19d7-4614-bb47-49a2f2744f1b /boot                   xfs     defaults        0 0
11 /dev/mapper/centos-swap swap                    swap    defaults        0 0
12 /dev/sdb1       /stdpart        xfs     defaults        0 0
```

❖ Logical Volume Manager (LVM):

- Used for extending the current disk capacity.
- Steps for creating LVM:

1. Add the partitions

```
[root@svr ~]# lsblk
NAME            MAJ:MIN RM  SIZE RO TYPE MOUNTPOINT
sda               8:0    0   30G  0 disk
├─sda1            8:1    0    1G  0 part /boot
└─sda2            8:2    0   29G  0 part
  ├─centos-root 253:0    0   26G  0 lvm  /
  └─centos-swap 253:1    0    3G  0 lvm  [SWAP]
sdb               8:16   0    5G  0 disk
└─sdb1            8:17   0    5G  0 part /stdpart
sdc               8:32   0    5G  0 disk
└─sdc1            8:33   0    5G  0 part
sdd               8:48   0    5G  0 disk
└─sdd1            8:49   0    5G  0 part
sde               8:64   0    5G  0 disk
└─sde1            8:65   0    5G  0 part
sr0              11:0    1  4.4G  0 rom  /run/media/root/CentOS 7 x86_64
[root@svr ~]#
```

2. Created LVM partitions

3. Created PV's

```
[root@svr ~]# pvs
  PV         VG     Fmt  Attr PSize   PFree
  /dev/sda2  centos lvm2 a--  <29.00g    0
[root@svr ~]# pvcreate /dev/sdc1 /dev/sdd1 /dev/sde1
  Physical volume "/dev/sdc1" successfully created.
  Physical volume "/dev/sdd1" successfully created.
  Physical volume "/dev/sde1" successfully created.
[root@svr ~]# pvs
  PV         VG     Fmt  Attr PSize   PFree
  /dev/sda2  centos lvm2 a--  <29.00g     0
  /dev/sdc1         lvm2 ---   <5.00g <5.00g
  /dev/sdd1         lvm2 ---   <5.00g <5.00g
  /dev/sde1         lvm2 ---   <5.00g <5.00g
[root@svr ~]#
```

4. Created VG group

```
[root@svr ~]# vgcreate vg1 /dev/sdc1 /dev/sdd1 /dev/sde1
  Volume group "vg1" successfully created
[root@svr ~]#
[root@svr ~]# vgs
  VG     #PV #LV #SN Attr   VSize   VFree
  centos   1   2   0 wz--n- <29.00g      0
  vg1      3   0   0 wz--n- <14.99g <14.99g
[root@svr ~]#
```

5. Created LV from VG group

```
[root@svr ~]# lvcreate -l 100%FREE -n lv1 vg1
  Logical volume "lv1" created.
[root@svr ~]# lvs
  LV   VG     Attr       LSize   Pool Origin Data%  Meta%  Move Log Cpy%Sync Convert
  root centos -wi-ao---- <26.00g
  swap centos -wi-ao----   3.00g
  lv1  vg1    -wi-a----- <14.99g
[root@svr ~]#
```

6. Create a mount point

```
#mkdir /lvm
```

7. Create file system (XFS) for /dev/vg1/lv1

```
[root@svr ~]# mkfs.xfs /dev/vg1/lv1
meta-data=/dev/vg1/lv1           isize=512    agcount=4, agsize=982272 blks
         =                       sectsz=512   attr=2, projid32bit=1
         =                       crc=1        finobt=0, sparse=0
data     =                       bsize=4096   blocks=3929088, imaxpct=25
         =                       sunit=0      swidth=0 blks
naming   =version 2              bsize=4096   ascii-ci=0 ftype=1
log      =internal log           bsize=4096   blocks=2560, version=2
         =                       sectsz=512   sunit=0 blks, lazy-count=1
realtime =none                   extsz=4096   blocks=0, rtextents=0
```

8. Mount this partition (temporary or permanent)
9. Verify.

Delete the LVM partition:
---
1. Unmounting the partition
    # umount <partition-name>
2. Removing the mount point
    # rm -rf /lvm
3. Remove the LV:
    # lvremove <vgname>
4. Remove the VG
    # vgremove
5. Remove the PV
    # pvremove
6. Delete the partition
    # fdisk /dev/sdc
        d
        w
    # fdisk /dev/sdd
    # fdisk /dev/sde
7. Remove the HDDs from the VMWare workstation.

- **Process Management:**

1st process:

1. init (In old Systems)
    - RHEL 6, Centos 6, Ubuntu 12.04, 16.04
2. system (In new systems)
    - RHEL 7 & above
    - Ubuntu 18.04 & above

To list all the processes:

pstree
pgrep <process-name>
top

```
top - 16:40:30 up  1:25,  2 users,  load average: 0.03, 0.04, 0.05
Tasks: 218 total,   1 running, 217 sleeping,   0 stopped,   0 zombie
%Cpu(s):  0.4 us,  0.4 sy,  0.0 ni, 99.3 id,  0.0 wa,  0.0 hi,  0.0 si,  0.0 st
KiB Mem :  3861292 total,  2048660 free,   922388 used,   890244 buff/cache
KiB Swap:  3145724 total,  3145724 free,        0 used.  2679100 avail Mem

  PID USER      PR  NI    VIRT    RES    SHR S  %CPU %MEM     TIME+ COMMAND
 7755 root      20   0 3293836 180188  70676 S   0.6  4.7   2:03.78 gnome-shell
 3076 root      20   0  254572   1572   1100 S   0.5  0.0   0:25.85 pcscd
  728 root      20   0  221644   5192   3952 S   0.3  0.1   0:16.43 vmtoolsd
 8604 root      20   0  562868   6464   5264 S   0.3  0.2   0:12.62 gsd-smartcard
 8927 root      20   0  151608   3520   2640 S   0.3  0.1   0:12.48 escd
 8945 root      20   0  608392  27300  18600 S   0.3  0.7   0:16.53 vmtoolsd
    3 root      20   0       0      0      0 S   0.2  0.0   0:13.53 kworker/0:0
 1398 root      20   0  346756  56760  28304 S   0.2  1.5   0:51.52 X
  423 root      20   0       0      0      0 S   0.1  0.0   0:06.48 xfsaild/dm-0
10885 root      20   0  162100   2360   1580 R   0.1  0.1   0:00.66 top
    1 root      20   0  125748   4272   2616 S   0.0  0.1   0:06.07 systemd
    2 root      20   0       0      0      0 S   0.0  0.0   0:00.03 kthreadd
    4 root       0 -20       0      0      0 S   0.0  0.0   0:00.00 kworker/0:0H
    6 root      20   0       0      0      0 S   0.0  0.0   0:00.59 ksoftirqd/0
    7 root      rt   0       0      0      0 S   0.0  0.0   0:00.47 migration/0
    8 root      20   0       0      0      0 S   0.0  0.0   0:00.00 rcu_bh
    9 root      20   0       0      0      0 S   0.0  0.0   0:04.87 rcu_sched
   10 root       0 -20       0      0      0 S   0.0  0.0   0:00.00 lru-add-drain
   11 root      rt   0       0      0      0 S   0.0  0.0   0:00.08 watchdog/0
   12 root      rt   0       0      0      0 S   0.0  0.0   0:00.07 watchdog/1
   13 root      rt   0       0      0      0 S   0.0  0.0   0:00.57 migration/1
   14 root      20   0       0      0      0 S   0.0  0.0   0:00.21 ksoftirqd/1
   16 root       0 -20       0      0      0 S   0.0  0.0   0:00.00 kworker/1:0H
   18 root      20   0       0      0      0 S   0.0  0.0   0:00.03 kdevtmpfs
   19 root       0 -20       0      0      0 S   0.0  0.0   0:00.00 netns
   20 root      20   0       0      0      0 S   0.0  0.0   0:00.01 khungtaskd
   21 root       0 -20       0      0      0 S   0.0  0.0   0:00.00 writeback
   22 root       0 -20       0      0      0 S   0.0  0.0   0:00.00 kintegrityd
```

kill

```
[root@svr Desktop]# pgrep yes
11128
[root@svr Desktop]# kill 11128
[root@svr Desktop]#
```

```
[root@svr Desktop]# firefox &
[1] 11800
[root@svr Desktop]# pgrep firefox
11800
11815
[root@svr Desktop]# kill -15 11303
bash: kill: (11303) - No such process
[root@svr Desktop]# kill -15 11800
[root@svr Desktop]# Exiting due to channel error.
Exiting due to channel error.
Exiting due to channel error.
Exiting due to channel error.
^C
[1]+  Terminated              firefox
[root@svr Desktop]#
```

❖ **Backup:**

1. Archive (collecting files & folder together)
   - tar (Tarball ARchive)
   - cmd:
     # tar -cvf filename.tar d1 d2 d3 f1 f2 f3
     c = create
     v = verbose
     f = archive filename

```
[root@svr Desktop]# mkdir backup
[root@svr Desktop]# cd backup/
[root@svr backup]# ls
[root@svr backup]#
[root@svr backup]# tar -cf mybackup.tar /etc /boot
tar: Removing leading `/' from member names
[root@svr backup]# ls
mybackup.tar
[root@svr backup]# du -sh mybackup.tar
193M    mybackup.tar
```

2. Compression (collecting files & folder together but also reducing the total size)

- gzip = higher compression speed (fast)
- bzip2 = higher compres sion rate (slow)

```
[root@svr backup]# cp mybackup.tar gzip.tar
[root@svr backup]# cp mybackup.tar bzip2.tar
[root@svr backup]# ls -lh
total 577M
-rw-r--r-- 1 root root 193M Apr 25 17:26 bzip2.tar
-rw-r--r-- 1 root root 193M Apr 25 17:25 gzip.tar
-rw-r--r-- 1 root root 193M Apr 25 17:22 mybackup.tar
[root@svr backup]# gzip gzip.tar
[root@svr backup]# ls -lh gzip.tar.gz
-rw-r--r-- 1 root root 151M Apr 25 17:25 gzip.tar.gz
[root@svr backup]# bzip2 bzip2.tar
[root@svr backup]# ls -lh bzip2.tar.bz2
-rw-r--r-- 1 root root 149M Apr 25 17:26 bzip2.tar.bz2
[root@svr backup]#
```