

CYSE 270: Linux System for Cybersecurity

Lab 7 – Manage Local Storage

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CYSE 270: Linux System for Cybersecurity

Part I— Check your file system (30 points).

Submit the screenshot for All the three steps.

Step 1. Execute the `ls /dev/sd*` command to see the current hard disk devices. [use sudo]

Step 2. Execute the `fdisk -l` command to list the current hard disk partitions. [use sudo]

Step 3. Execute the `parted -l` command to list the current hard disk partition table. [use sudo]

```
(niayaf@niayaf)-[~]
└─$ sudo ls /dev/sd*
[sudo] password for niayaf:
/dev/sda /dev/sda1 /dev/sda2 /dev/sda5

(niayaf@niayaf)-[~]
└─$ sudo fdisk -l
Disk /dev/sda: 50 GiB, 53687091200 bytes, 104857600 sectors
Disk model: VBOX HARDDISK
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disklabel type: dos
Disk identifier: 0xa602ecb0

Device Boot      Start         End      Sectors  Size Id Type
/dev/sda1 *        2048     99422207  99420160  47.4G 83 Linux
/dev/sda2          99424254 104855551  5431298   2.6G  f W95 Ext'd (LBA)
/dev/sda5          99424256 104855551  5431296   2.6G 82 Linux swap / Solaris

(niayaf@niayaf)-[~]
└─$ sudo parted -l
Model: ATA VBOX HARDDISK (scsi)
Disk /dev/sda: 53.7GB
Sector size (logical/physical): 512B/512B
Partition Table: msdos
Disk Flags:

Number  Start   End     Size    Type     File system  Flags
  1      1049kB  50.9GB  50.9GB  primary  ext4          boot
  2      50.9GB  53.7GB  2781MB  extended lba
  5      50.9GB  53.7GB  2781MB  logical  linux-swap(v1) swap
```

Part II– Create a new virtual disk (30 points)

Submit the screenshot for All the three steps.

Step 1. In the VM setting, attach a new virtual hard disk with the size of 200 MB to our current Linux VM. Name it as “your_midass.vdi” [**HINT:** Please refer to the slides and discussion during the class for week 7]

Step 2. Load this virtual hard disk to your virtual machine.

Step 3. Repeat the steps in Part I and **highlight the differences** after adding the new virtual hard disk.

```
(niayaf@niayaf)-[~]
└─$ sudo ls /dev/sd*
[sudo] password for niayaf:
/dev/sda /dev/sda1 /dev/sda2 /dev/sda5 /dev/sdb

(niayaf@niayaf)-[~]
└─$ sudo fdisk -l
Disk /dev/sdb: 200 MiB, 209715200 bytes, 409600 sectors
Disk model: VBOX HARDDISK
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes

Disk /dev/sda: 50 GiB, 53687091200 bytes, 104857600 sectors
Disk model: VBOX HARDDISK
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disklabel type: dos
Disk identifier: 0xa602ecb0

Device Boot Start End Sectors Size Id Type
/dev/sda1 * 2048 99422207 99420160 47.4G 83 Linux
/dev/sda2 99424254 104855551 5431298 2.6G f W95 Ext'd (LBA)
/dev/sda5 99424256 104855551 5431296 2.6G 82 Linux swap / Solaris

(niayaf@niayaf)-[~]
└─$ sudo parted -l
Model: ATA VBOX HARDDISK (scsi)
Disk /dev/sda: 53.7GB
Sector size (logical/physical): 512B/512B
Partition Table: msdos
Disk Flags:

Number Start End Size Type File system Flags
1 1049kB 50.9GB 50.9GB primary ext4 boot
2 50.9GB 53.7GB 2781MB extended lba
5 50.9GB 53.7GB 2781MB logical linux-swap(v1) swap

Error: /dev/sdb: unrecognised disk label
Model: ATA VBOX HARDDISK (scsi)
Disk /dev/sdb: 210MB
Sector size (logical/physical): 512B/512B
Partition Table: unknown
Disk Flags:
```

Part III – Creating Partitions and Filesystems (60 points)

Submit the screenshot for All the three eight steps.

Step 1. Use the `fdisk` command to create a new primary partition on the new virtual hard disk attached in Part II.

```
(niayaf@niayaf)-[~]
└─$ sudo fdisk /dev/sdb

Welcome to fdisk (util-linux 2.41).
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.
Created a new DOS (MBR) disklabel with disk identifier 0x0abbb344.

Command (m for help): n
Partition type
   p   primary (0 primary, 0 extended, 4 free)
   e   extended (container for logical partitions)
Select (default p): p
Partition number (1-4, default 1): 1
First sector (2048-409599, default 2048):
Last sector, +/-sectors or +/-size{K,M,G,T,P} (2048-409599, default 409599):

Created a new partition 1 of type 'Linux' and of size 199 MiB.

Command (m for help):

Command (m for help): w

The partition table has been altered.
Calling ioctl() to re-read partition table.
Syncing disks.
```

Step 2. Use the correct command to **create an ext4 filesystem** on the new partition.

```
(niayaf@niayaf)-[~]
└─$ sudo mkfs -t ext4 /dev/sdb1
mke2fs 1.47.2 (1-Jan-2025)
Creating filesystem with 203776 1k blocks and 51000 inodes
Filesystem UUID: d03fdb27-23b6-44ce-806b-0906b243f689
Superblock backups stored on blocks:
    8193, 24577, 40961, 57345, 73729

Allocating group tables: done
Writing inode tables: done
Creating journal (4096 blocks): done
Writing superblocks and filesystem accounting information: done
```

Step 3. Repeat the steps in Part I and highlight the differences.

```
└─$ sudo ls /dev/sd*
/dev/sda /dev/sda1 /dev/sda2 /dev/sda5 /dev/sdb /dev/sdb1

(niayaf@niayaf)-[~]
└─$ sudo fdisk -l
Disk /dev/sdb: 200 MiB, 209715200 bytes, 409600 sectors
Disk model: VBOX HARDDISK
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disklabel type: dos
Disk identifier: 0x0abbb344

Device      Boot Start    End Sectors  Size Id Type
/dev/sdb1           2048 409599 407552  199M 83 Linux

Disk /dev/sda: 50 GiB, 53687091200 bytes, 104857600 sectors
Disk model: VBOX HARDDISK
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disklabel type: dos
Disk identifier: 0xa602ecb0

Device      Boot  Start        End  Sectors  Size Id Type
/dev/sda1   *          2048 99422207 99420160 47.4G 83 Linux
/dev/sda2           99424254 104855551 5431298   2.6G  f W95 Ext'd (LBA)
/dev/sda5           99424256 104855551 5431296   2.6G 82 Linux swap / Solaris

(niayaf@niayaf)-[~]
└─$ sudo parted -l
Model: ATA VBOX HARDDISK (scsi)
Disk /dev/sda: 53.7GB
Sector size (logical/physical): 512B/512B
Partition Table: msdos
Disk Flags:

Number  Start  End      Size    Type    File system  Flags
  1      1049kB 50.9GB  50.9GB  primary ext4          boot
  2      50.9GB 53.7GB  2781MB  extended lba
  5      50.9GB 53.7GB  2781MB  logical  linux-swap(v1) swap

Model: ATA VBOX HARDDISK (scsi)
Disk /dev/sdb: 210MB
Sector size (logical/physical): 512B/512B
Partition Table: msdos
Disk Flags:

Number  Start  End      Size    Type    File system  Flags
  1      1049kB 210MB   209MB   primary ext4
```

Step 4. Make a new directory named **/cyse**. And **mount** the new partition under this directory.

```
(niayaf@niayaf)-[~]
└─$ sudo mkdir /cyse

(niayaf@niayaf)-[~]
└─$ sudo mount /dev/sdb1 /cyse
```

Step 5. Use the `df` command to check the mounting point of the new partition.

```
(niayaf@niayaf)-[~]
└─$ df
Filesystem      1K-blocks      Used Available Use% Mounted on
udev            11371060         0  11371060   0% /dev
tmpfs           2287780        1008   2286772   1% /run
/dev/sda1       48614564 15121364 30991312  33% /
tmpfs           11438892         4   11438888   1% /dev/shm
tmpfs           5120            0     5120     0% /run/lock
tmpfs           1024            0     1024     0% /run/credentials/systemd-journald.service
tmpfs           11438896         8   11438888   1% /tmp
tmpfs           1024            0     1024     0% /run/credentials/getty@tty1.service
tmpfs           2287776         116   2287660   1% /run/user/1000
/dev/sdb1       185325          63    170999   1% /cyse
```

Step 6. Create a new file named for **YourMIDAS.txt** (replace YourMIDAS with your MIDAS ID) in the directory `/cyse` and put your name in that file.

```
(niayaf@niayaf)-[~/cyse]
└─$ sudo touch nfull005.txt

(niayaf@niayaf)-[~/cyse]
└─$ ls
lost+found  nfull005.txt

(niayaf@niayaf)-[~/cyse]
└─$
```

I had tried to write using `echo 'niaya' > nfull005.txt` and `cat >> nfull005.txt` but every time I did it said I didn't have permission to. I was unsure if I was able to use commands I saw online, so I didn't and just created an empty file.

Step 7. Unmount `/cyse` directory.

```
(niayaf@niayaf)-[~/]
└─$ sudo umount /dev/sdb1
```

Step 8. Check the contents in `/cyse` directory. What do you find?

```
(niayaf@niayaf)-[~/]
└─$ ls /cyse

(niayaf@niayaf)-[~/]
└─$
```

There was nothing.