

# LAB 4 - DISK MANAGEMENT

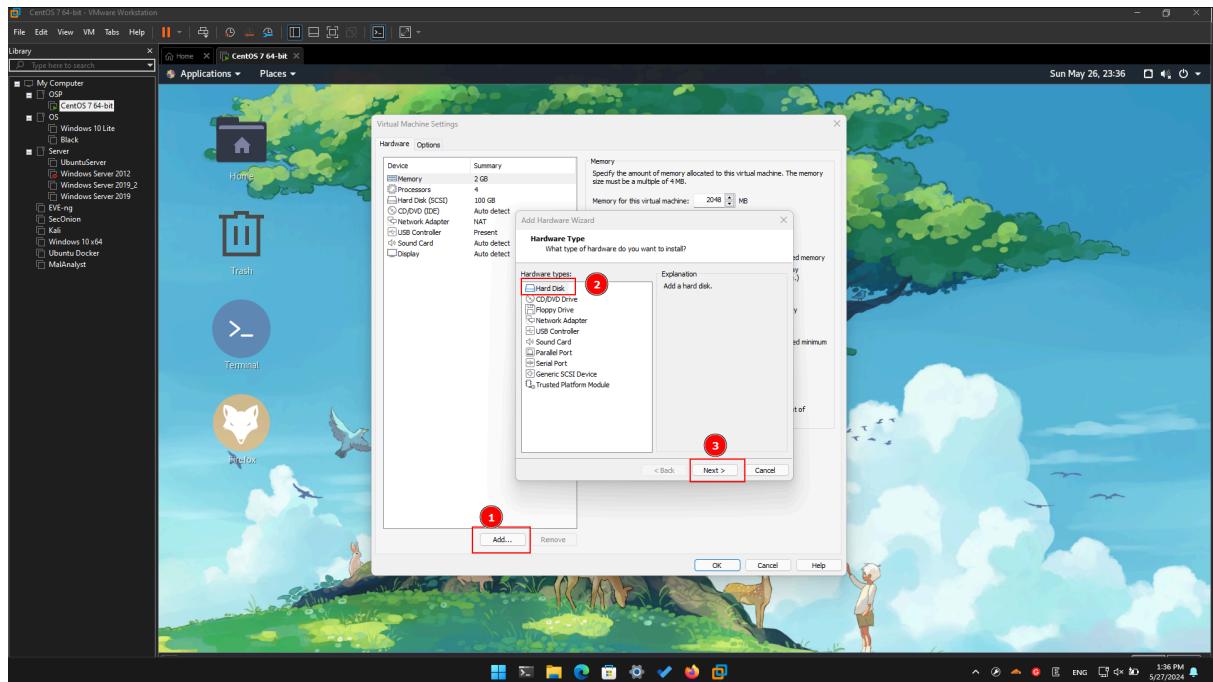
Members:

- Huỳnh Ngọc Quang (SE181838)
- Nguyễn Văn Nhân (SE183547)
- Nguyễn Trung Nguyên (SE183195)

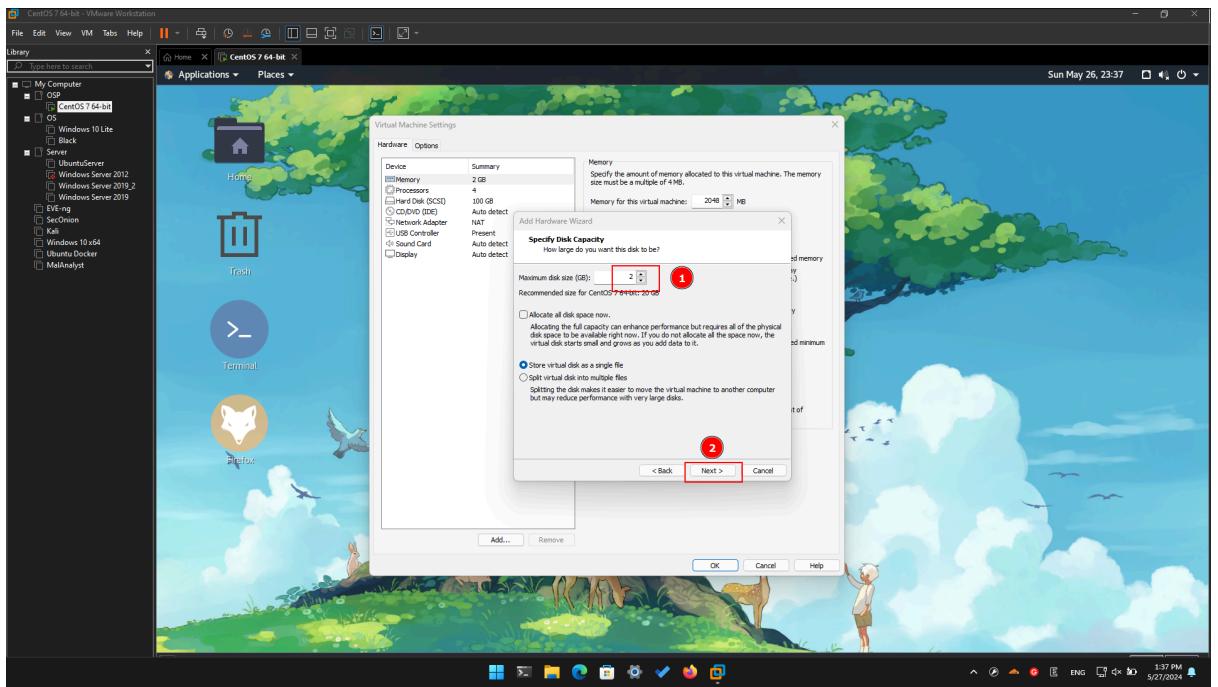
Objectives:

- Add a new physical disk
- Create a partition for the new disk
- Format the new partition
- Mount the new partition manually
- Mount the new partition automatically

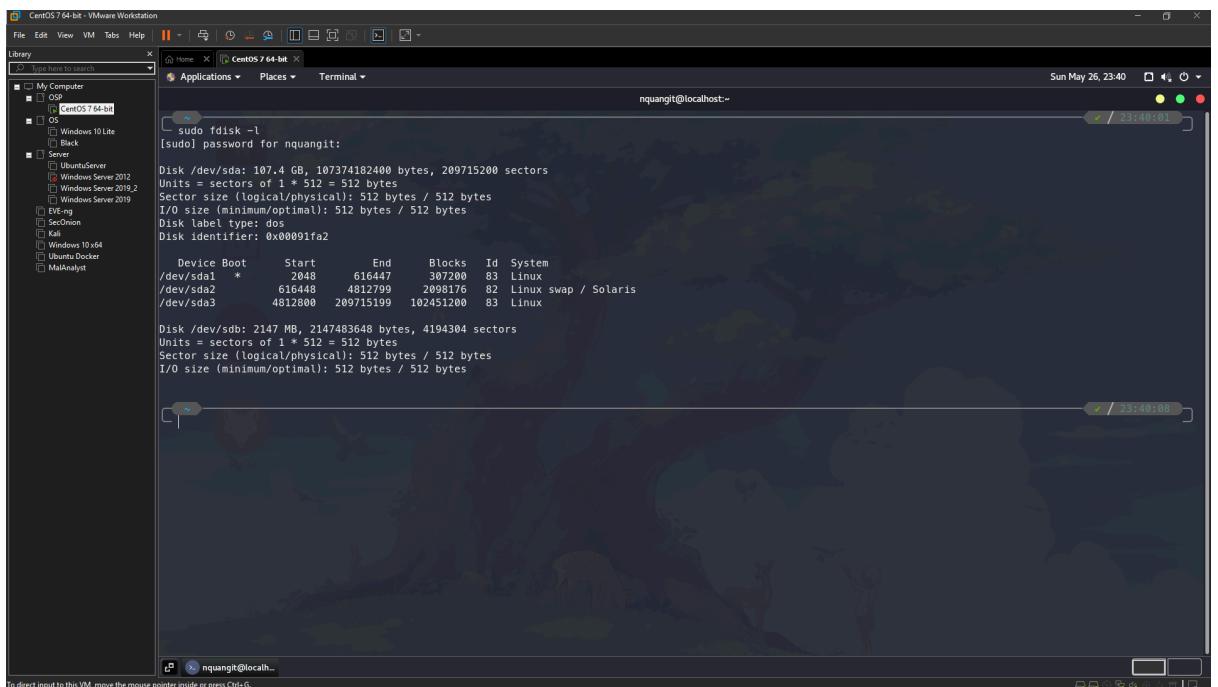
## A. Add a new physical disk to the CentOS machine



Click **Next** for Recommend selection.



## B. Create a partition for the new disk



Check the new physical disk

```

CentOS 7.6.1810 - VMware Workstation
File Edit View VM Tabs Help | 
Library X Home X CentOS 7.6.1810 X Applications Places Terminal Mon May 27, 00:26
nquangit@localhost:~/.local/share/nautilus/python/ / 5s / 00:26:13
Type here to search
sudo 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.

Command (m for help): p
Disk /dev/sdb: 2147 MB, 2147483648 bytes, 4194304 sectors
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 label type: dos
Disk identifier: 0xcc814993

Device Boot Start End Blocks Id System
Command (m for help): n
Partition type:
   p   primary (0 primary, 0 extended, 4 free)
   e   extended
Select (default p):
Using default response p
Partition number (1-4, default 1):
First sector (2048-4194303, default 2048):
Using default value 2048
Last sector, +sectors or +size{K,M,G} (2048-4194303, default 4194303):
Using default value 4194303
Partition 1 of type Linux and of size 2 GiB is set

Command (m for help): w
The partition table has been altered!
Calling ioctl() to re-read partition table.
Syncing disks.

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```

Run fdisk to create a new partition for the physical disk  
w for saving changes

```

CentOS 7.6.1810 - VMware Workstation
File Edit View VM Tabs Help | 
Library X Home X CentOS 7.6.1810 X Applications Places Terminal Mon May 27, 00:27
nquangit@localhost:~/.local/share/nautilus/python/ / 10s / 00:26:26
Type here to search
sudo fdisk -l
Disk /dev/sda: 107.4 GB, 107374182400 bytes, 209715200 sectors
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 label type: dos
Disk identifier: 0x00091fa2

Device Boot Start End Blocks Id System
/dev/sda1 * 2048 616447 307200 83 Linux
/dev/sda2 616448 4812799 2098176 82 Linux swap / Solaris
/dev/sda3 4812800 209715199 102451200 83 Linux

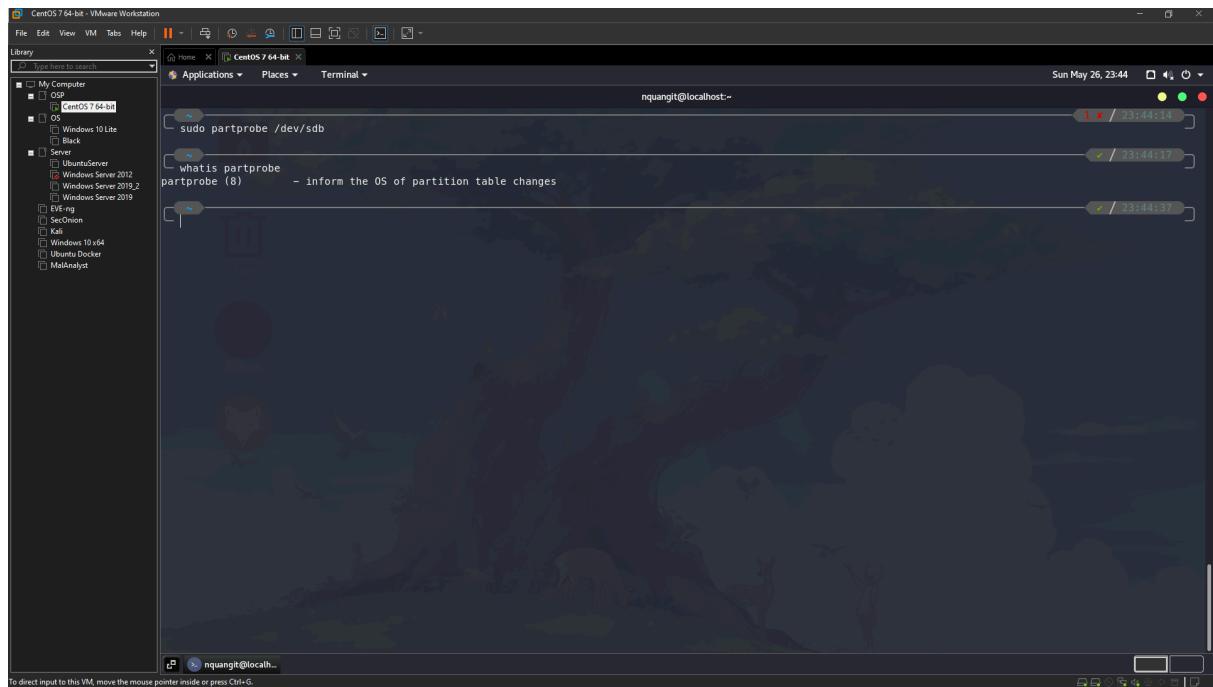
Disk /dev/sdb: 2147 MB, 2147483648 bytes, 4194304 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk label type: dos
Disk identifier: 0xcc814993

Device Boot Start End Blocks Id System
/dev/sdb1 2048 4194303 2096128 83 Linux

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```

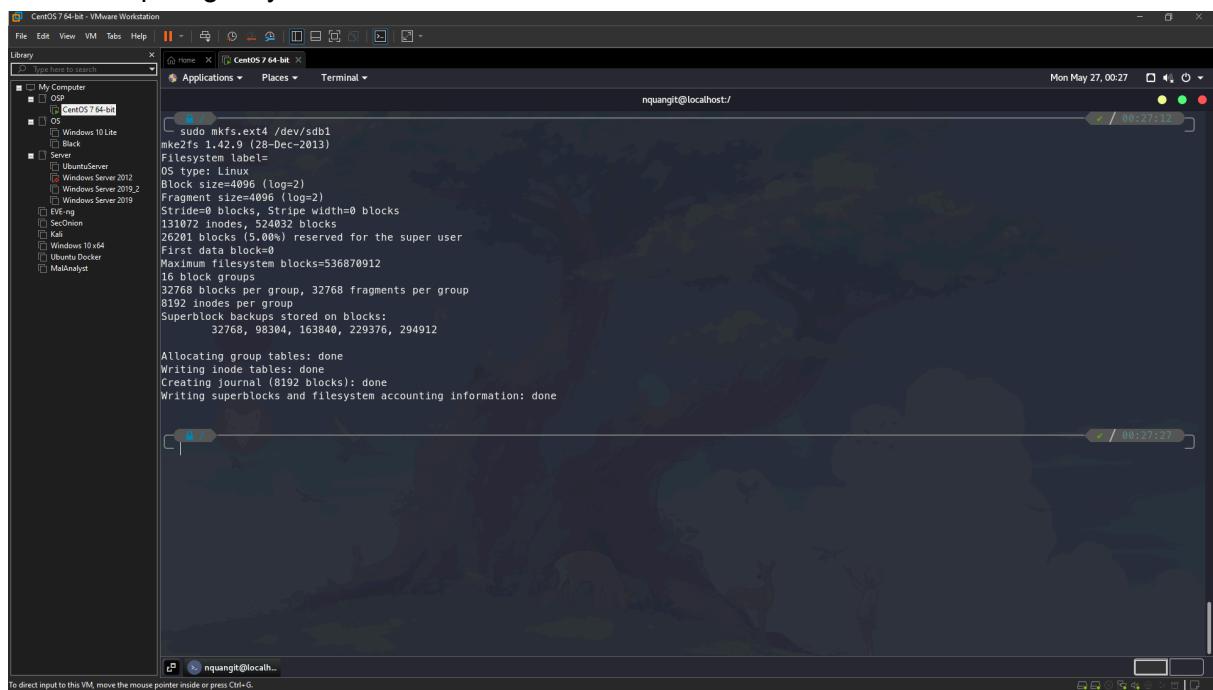
## C. Format the new partition



The screenshot shows a CentOS 7 64-bit VM in VMware Workstation. The terminal window displays the command `sudo partprobe /dev/sdb` being run, followed by the output "partprobe (B) - inform the OS of partition table changes". The desktop background features a nature scene with a tree and animals.

```
sudo partprobe /dev/sdb
partprobe (B) - inform the OS of partition table changes
```

Run **partprobe** to inform the OS of partition table changes for the disk `/dev/sdb` without requiring a system reboot.



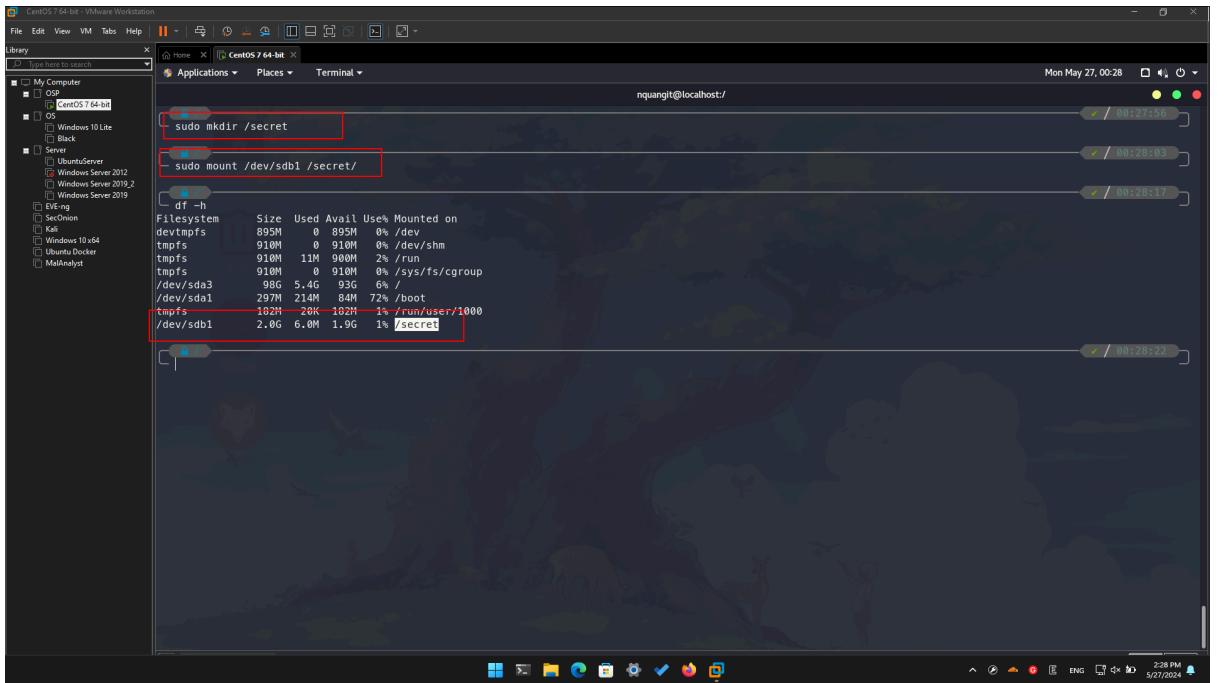
The screenshot shows a CentOS 7 64-bit VM in VMware Workstation. The terminal window displays the command `sudo mkfs.ext4 /dev/sdb1` being run, followed by the output of the `mke2fs` command showing file system parameters and allocation details. The desktop background features a nature scene with a tree and animals.

```
sudo mkfs.ext4 /dev/sdb1
mke2fs 1.42.9 (28-Dec-2013)
Filesystem label=
OS type: Linux
Block size=4096 (log=2)
Fragment size=4096 (log=2)
Stride=8 blocks, Stripe width=8 blocks
131072 inodes, 124032 blocks
1032 blocks (5.00%) reserved for the super user
First data block=0
Maximum filesystem blocks=536870912
16 block groups
32768 blocks per group, 32768 fragments per group
8192 inodes per group
Superblock backups stored on blocks:
    32768, 98304, 163840, 229376, 294912

Allocating group tables: done
Writing inode tables: done
Creating journal (8192 blocks): done
Writing superblocks and filesystem accounting information: done
```

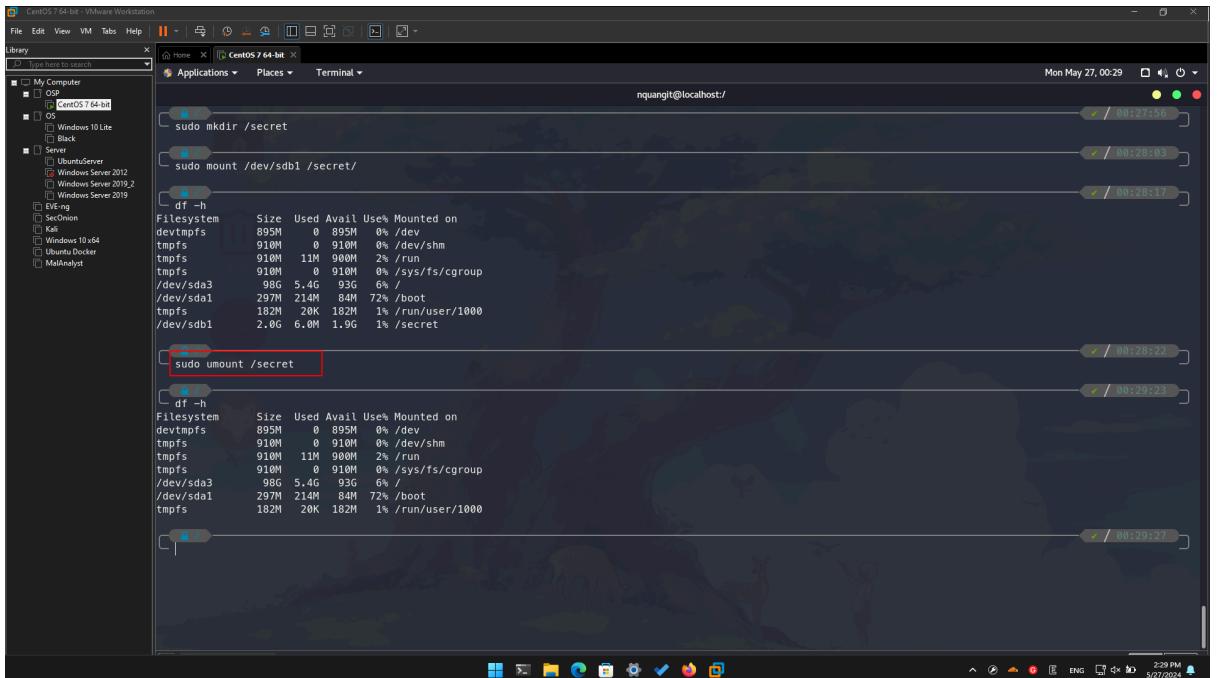
Use **mkfs.ext4** to format the new partition as an ext4 file system

## D. Mount the new partition manually



```
sudo mkdir /secret
sudo mount /dev/sdb1 /secret/
df -h
Filesystem      Size   Used  Avail Use% Mounted on
/devtmpfs        895M    0B  895M  0% /dev
tmpfs           910M    0B  910M  0% /dev/shm
tmpfs           910M   11M  908M  2% /run
tmpfs           910M    0B  910M  0% /sys/fs/cgroup
/dev/sda3       98G  5.4G  93G  6% /
/dev/sda1       297M  214M  84M  72% /boot
tmpfs          182M   20K  182M  1% /run/user/1000
/dev/sdb1       2.0G  6.0M  1.9G  1% /secret
```

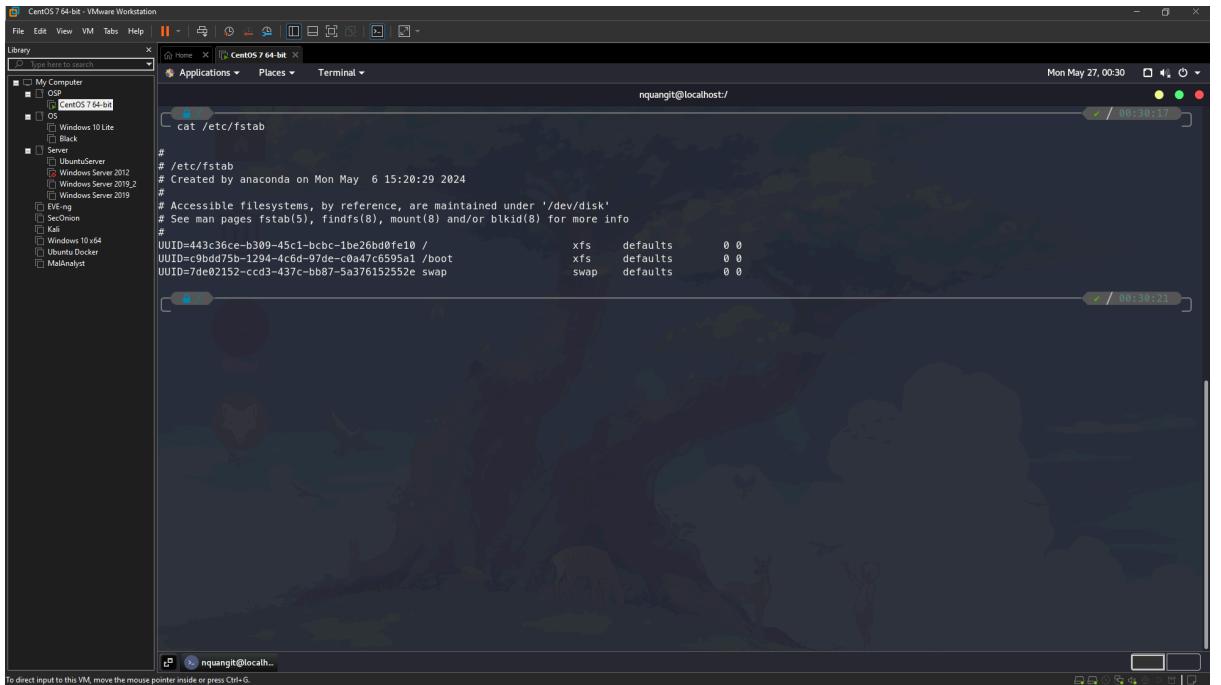
1. Create a new directory to mount the new partition.
2. Mount the new partition to the new directory.



```
sudo umount /secret
df -h
Filesystem      Size   Used  Avail Use% Mounted on
/devtmpfs        895M    0B  895M  0% /dev
tmpfs           910M    0B  910M  0% /dev/shm
tmpfs           910M   11M  908M  2% /run
tmpfs           910M    0B  910M  0% /sys/fs/cgroup
/dev/sda3       98G  5.4G  93G  6% /
/dev/sda1       297M  214M  84M  72% /boot
tmpfs          182M   20K  182M  1% /run/user/1000
/dev/sdb1       2.0G  6.0M  1.9G  1% /secret
```

Or un mount

## E. Mount the new partition automatically



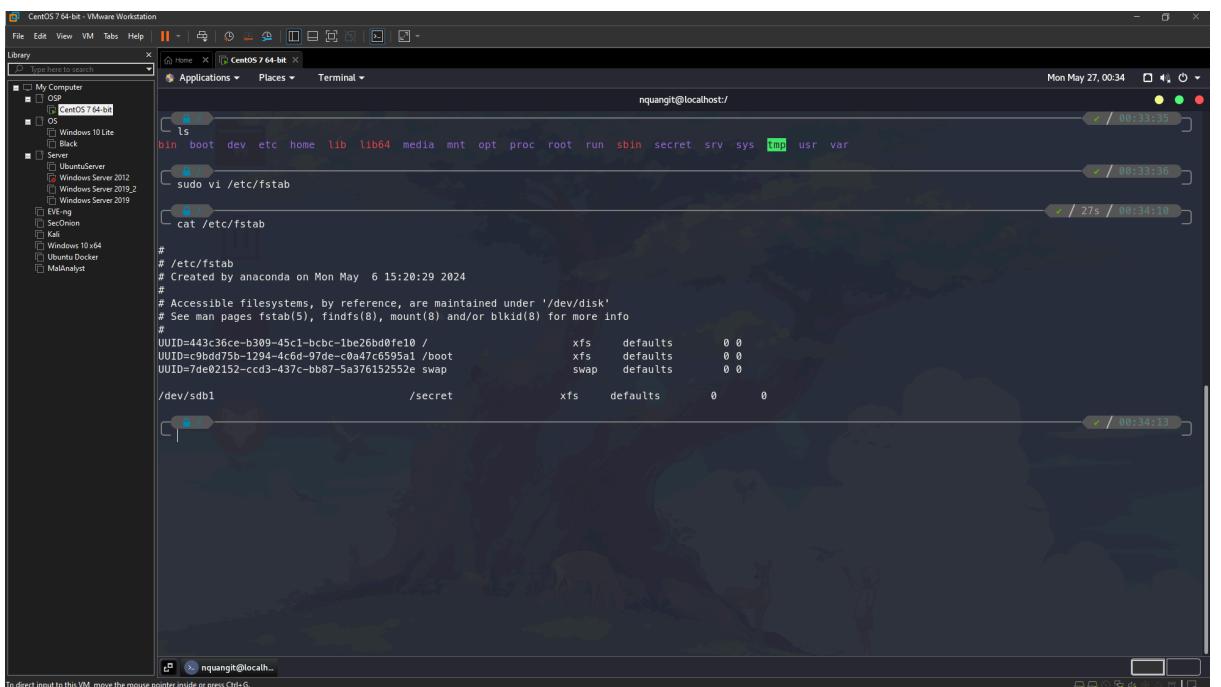
The screenshot shows a CentOS 7 VM in VMware Workstation. The terminal window displays the contents of the /etc/fstab file:

```
cat /etc/fstab
#
# /etc/fstab
# Created by anaconda on Mon May  6 15:20:29 2024
#
# Accessible filesystems, by reference, are maintained under '/dev/disk'
# See man pages fstab(5), findfs(8), mount(8) and/or blkid(8) for more info
#
UUID=443c36cc-b300-45c1-bcbc-1be26bd0f0e10 /          xfs    defaults    0  0
UUID=c9bdd75b-1294-4c6d-97de-c0a47c6595a1 /boot        xfs    defaults    0  0
UUID=d7e02152-cdd3-437c-bb87-5a376152552e swap         swap   defaults    0  0
```

We can automatically mount the disk on boot with **fstab** file

Structure:

1. Block a special device or remote filesystem to be mounted.
2. The mount point for the filesystem.
3. The type of the filesystem.
4. The mount options associated with the filesystem.
5. Determine which filesystems need to be dumped.
6. Determine the order in which filesystem checks are done at reboot time.



The screenshot shows a CentOS 7 VM in VMware Workstation. The terminal window shows the /etc/fstab file being edited and a new entry added:

```
ls
sudo vi /etc/fstab
cat /etc/fstab
```

The /etc/fstab file now includes the new entry:

```
# /etc/fstab
# Created by anaconda on Mon May  6 15:20:29 2024
#
# Accessible filesystems, by reference, are maintained under '/dev/disk'
# See man pages fstab(5), findfs(8), mount(8) and/or blkid(8) for more info
#
UUID=443c36cc-b300-45c1-bcbc-1be26bd0f0e10 /          xfs    defaults    0  0
UUID=c9bdd75b-1294-4c6d-97de-c0a47c6595a1 /boot        xfs    defaults    0  0
UUID=d7e02152-cdd3-437c-bb87-5a376152552e swap         swap   defaults    0  0
/dev/sdb1          /secret      xfs    defaults    0  0
```

Add this line for automatic mount /dev/sdb1 to /secret on boot.