Introduction to Linux Boot, Homework

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2 grudnia 2023

1 Removing GRUB

Steps:

- GRUB has been saved on a separate file on a disk
- GRUB in has been moved from /boot directory to directory /home/tomasz
- Virtual Machine has been rebooted
- Operating System does not boot anymore. See figure 1

Figure 1: Failed to boot OS on VM

2 GRUB recovery

After GRUB removing, OS on Virtual Machine cannot open. System recovery will be conducted via Live CD with Ubuntu Image. Steps to be taken:

- Create virtual cd disk with Ubuntu Image
- In VirtualBox enable Live CD by checking the box in Settings/Storage/ubuntu-22.04.3-desktop-amd64.iso/Attributes. See figure 2

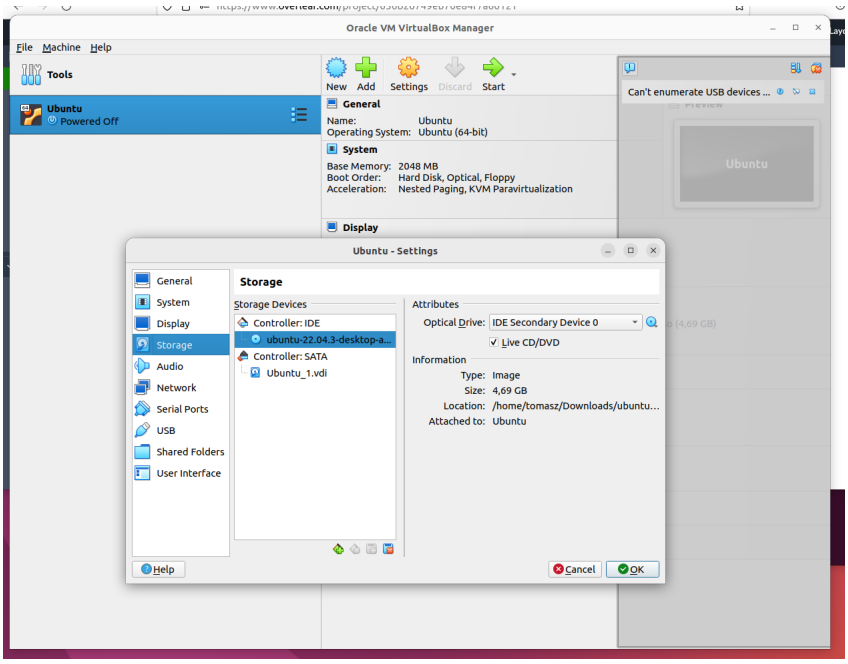

Figure 2: Virtual optical disk with Live CD enabled

- After creating Live CD, you have to insert it into Virtual Machine
- Then change boot order, so that CD is booted first. See figure 3

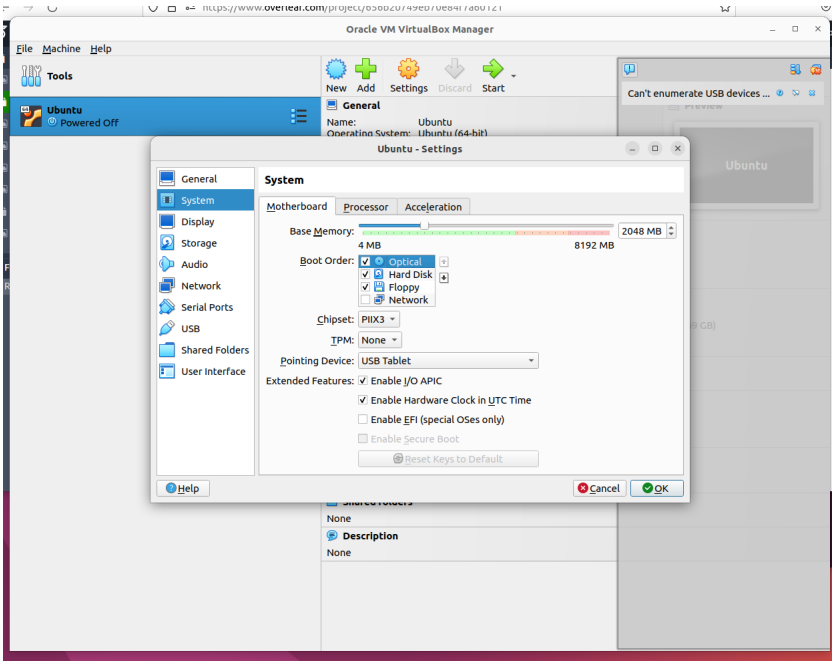

Figure 3: Changing boot order

- Run virtual machine
- In GRUB menu choose option Try or Install Ubuntu. See figure 4

Figure 4: GRUB menu by booting from Live CD

- After successful booting of Ubuntu from Live CD choose option Install Ubuntu
- After logging into try ubuntu change virtual termin with key combination

```
Fn + Right Ctrl + F3
```

  changed virtual terminal. See figure 5

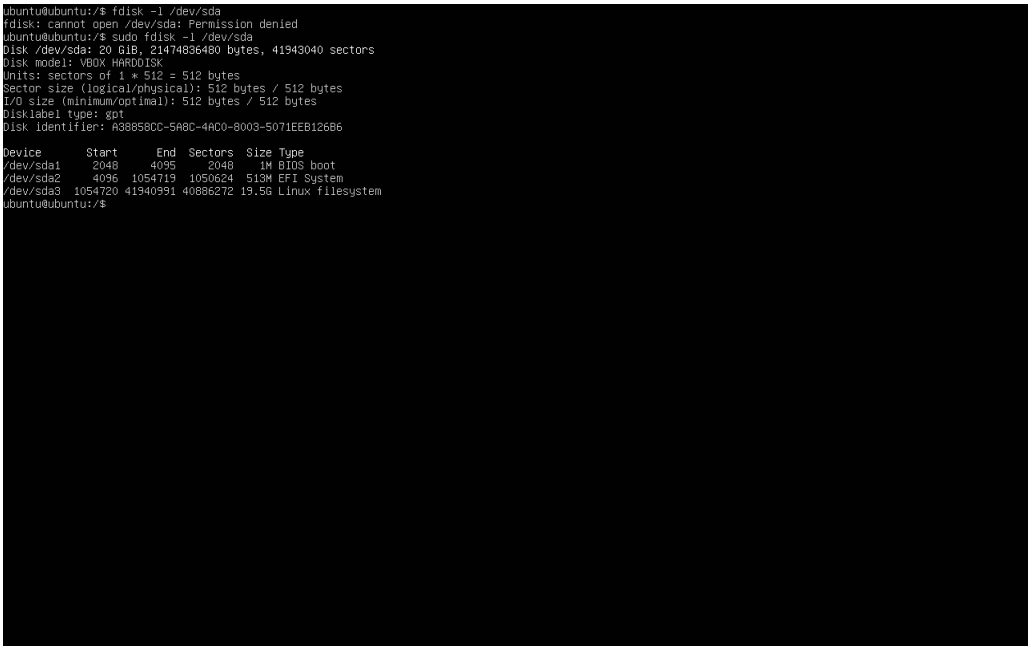

Figure 5: Third virtual terminal. List available partitions

In newly opened virtual terminal do the following steps:

- List available partitions:

```
sudo fdisk -l /dev/sda
```

- Output 5 shows that there are 3 partitions. We assume that partition with OS to be recover is in /dev/sda3

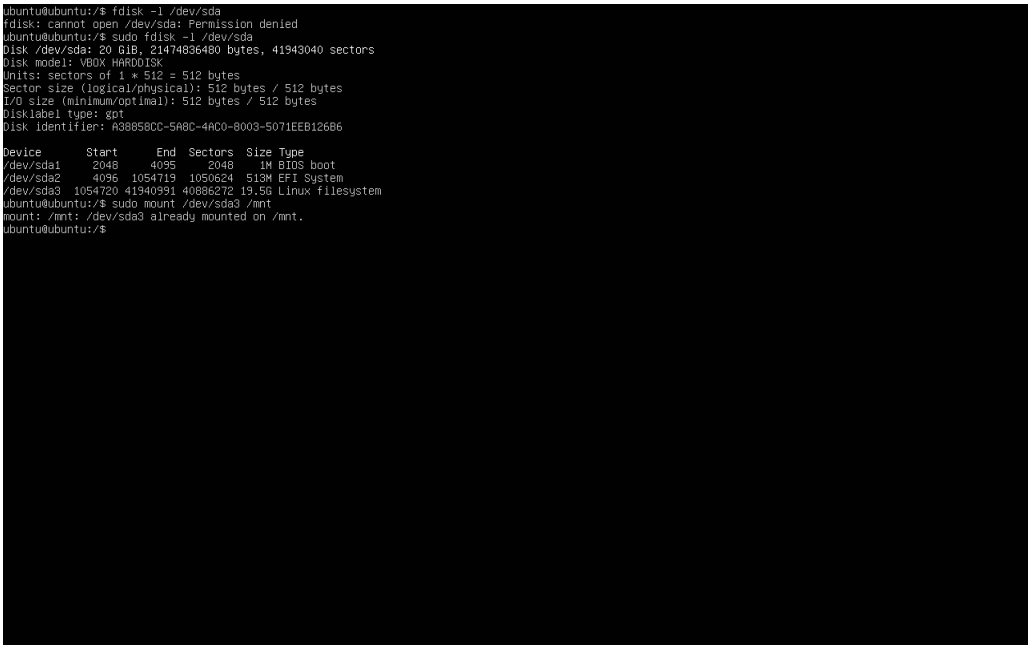

Figure 6: Mounting linux partition

- Mount /dev/sda3 to /mnt. See figure 6

```
sudo mount /dev/sda3 /mnt
```

- list folder and files in /mnt. See figure 7

```
ls /mnt
```

- change apparent root directory

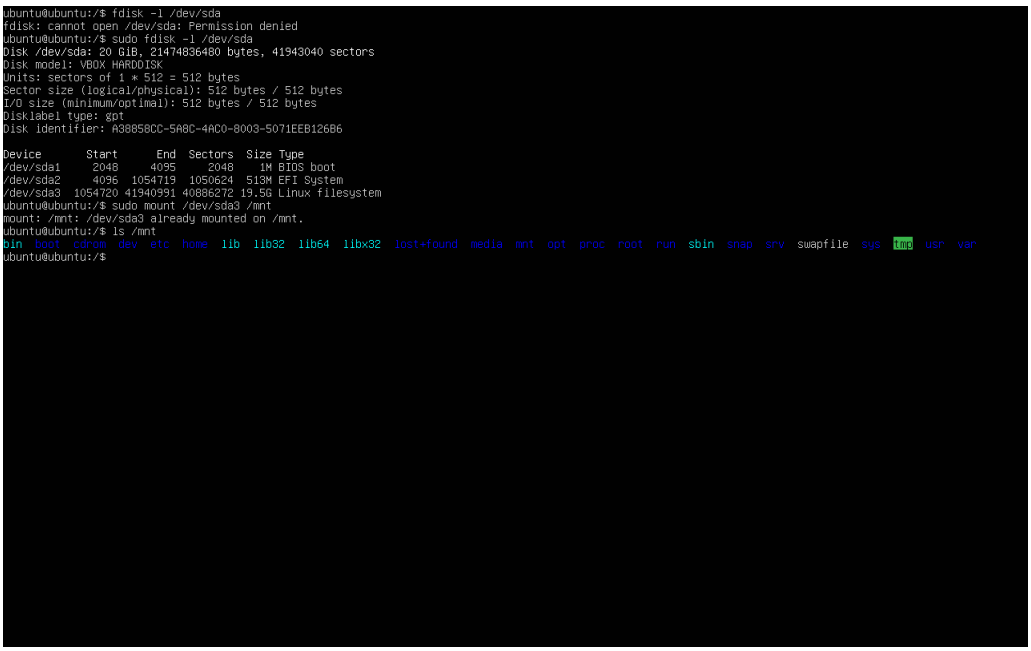

Figure 7: List files from /mnt

- Before removing GRUB, grub folder from /boot was moved to /home/tomasz. To recover GRUB you have to move it from /home/tomasz to /boot. See figure 8

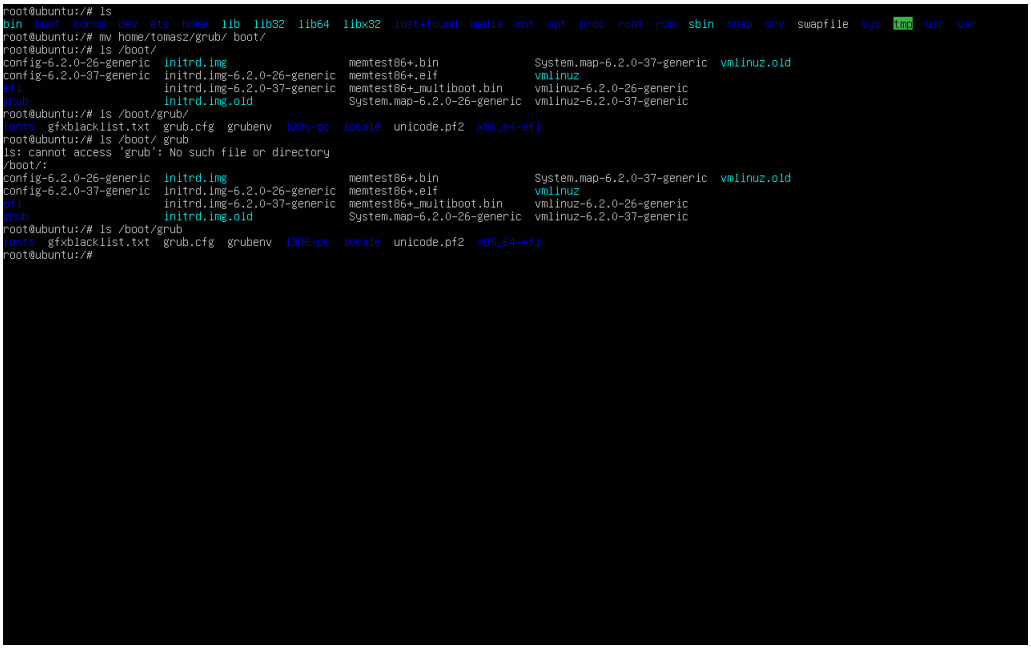

Figure 8: Move GRUB folder back to /boot

- With

  ```
  Fn + Right Ctrl + F2
  ```

  get back to default virtual terminal

- In Console Terminal typed

```
shutdown now
```

to close virtual machine

- In virtual machine settings booting hierarchy has been changed.

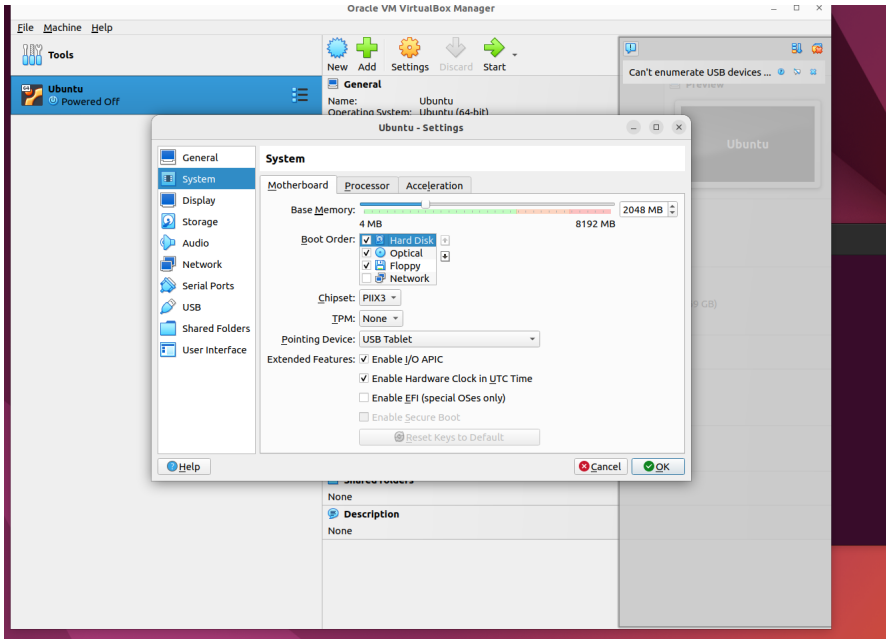

Figure 9: Changing boot hierarchy

- Virtual machine has been started. OS boots correctly.

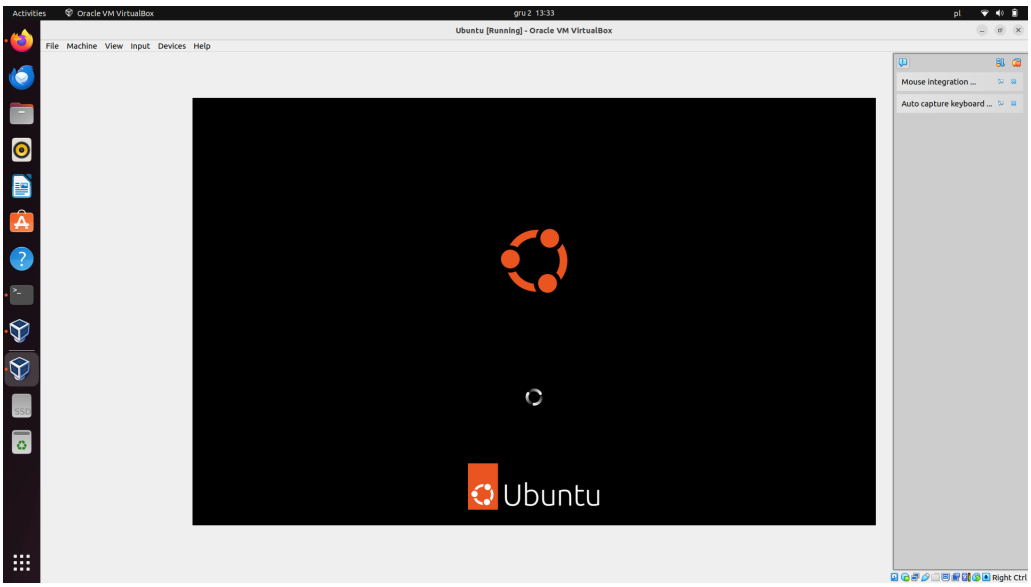

Figure 10: Ubuntu booting correctly

3 Results

After GRUB recovery, OS boots correctly.