# Template Week 5 – Operating Systems

Student number: 579053 (Andy Melkonian)

**Assignment 5.1: Unix-like**

a) Find out what the difference is between UNIX and unix-like operating systems?

Unix is beschermd en mag alleen volgens de UNIX systeem eigenaren maar unix like dat kan iedereen doen is en een systeem dat op unix lijkt

b) Study the image above named UNIX timeline. Find out who Ken Thompson, Dennis Ritchie, Bill Joy, Richard Stallman, and Linus Torvalds are and what they have contributed to the development of UNIX or unix-like systems and to IT in general. **TIP!** English-language sources often contain more detailed information about these individuals.

**Ken Thompson:** Grondlegger van het originele UNIX bij Bell Labs en ontwerper van de programmeertaal B.
**Dennis Ritchie:** Creëerde de programmeertaal **C** en was samen met Thompson de belangrijkste maker van UNIX.
**Bill Joy:** Sleutelfiguur achter **BSD Unix**, maker van de teksteditor vi en mede-oprichter van Sun Microsystems (bekend van Java).
**Richard Stallman:** Oprichter van de **GNU-beweging** en de Free Software Foundation. Hij bedacht het concept 'copyleft' en de GPL-licentie.
**Linus Torvalds:** De maker van de **Linux-kernel**, het hart van besturingssystemen zoals Ubuntu, Android en ChromeOS. Hij ontwikkelde ook **Git**.

c) What is the philosophy of the GNU movement?

De kernfilosofie is **"Vrije Software"** (Free Software) Gebruikers moeten vier vrijheden hebben de vrijheid om de software te gebruiken, te bestuderen, te kopiëren en te wijzigen.

d) Does Ubuntu as a Linux operating system conform to the philosophy of the GNU movement? Please explain your answer.

Nee niet volledig omdat je niet VOLLEDIG vrij bent omdat je toegang hebt tot niet vrije applicaties via de winkels en drivers

e) Find out what is the Windows Subsystem for Linux?

Een compatibiliteitslaag waardoor je linux systemen en tools kunt draaien op windows zonder aparte dual boot etc

f) Find out, which operating system family belongs to Android, iOS and ChromeOS?

Android: Linux
IOS: Unix-like
ChromeOS: Linux

**Assignment 5.2: Supercomputers and gameconsoles**

a) Research on this site what supercomputers are used for and write a short summary of it:
https://www.computerhistory.org/timeline/search/?q=Supercomputer

Op basis van de tijdlijn worden supercomputers ingezet voor zware rekentaken zoals wetenschappelijk onderzoek klimaatsimulaties etc en militaire toepassingen zoals het beheren van nucleaire dingen en AI-uitdagingen zoals schaken tegen wereldkampioenen (Deep Blue).

b) IBM is a company that has already built a number of supercomputers. One of them is IBM's Roadrunner. The CPU developed for this supercomputer was further developed at a later stage as the CPU for the PlayStation 3 console. Find out what a **PlayStation 3 cluster** is and what it was used for?

PlayStation 3-cluster is een supercomputer die bestaat uit meerdere gekoppelde PS3-consoles, waarbij gebruik wordt gemaakt van hun krachtige 'Cell'-processors. Ze werden gebruikt voor goedkope high-performance computing

c) You can build a supercomputer by putting a few computers together in a cluster. Here's what Oracle did with a collection of Raspberry Pi's, for example:
https://blogs.oracle.com/developers/post/building-the-worlds-largest-raspberry-pi-cluster
What specific operating system is running on this cluster?

Oracle linux

d) Does Oracle's Raspberry Pi supercomputer appear in the list of the 500 fastest supercomputers in the world? Make a logical decision for this, without going through the entire list.
https://www.top500.org/lists/top500/list/2023/06/

Nee het komt er niet in voor want het heeft gewoon niet genoeg rekenkracht als andere doorsnee supercomputers

e) What CPU architecture is used for the PlayStation 5 and Xbox Series X?
What operating systems run on these consoles?
What conclusion can you draw from the answer to the previous question?

Amd Zen 2

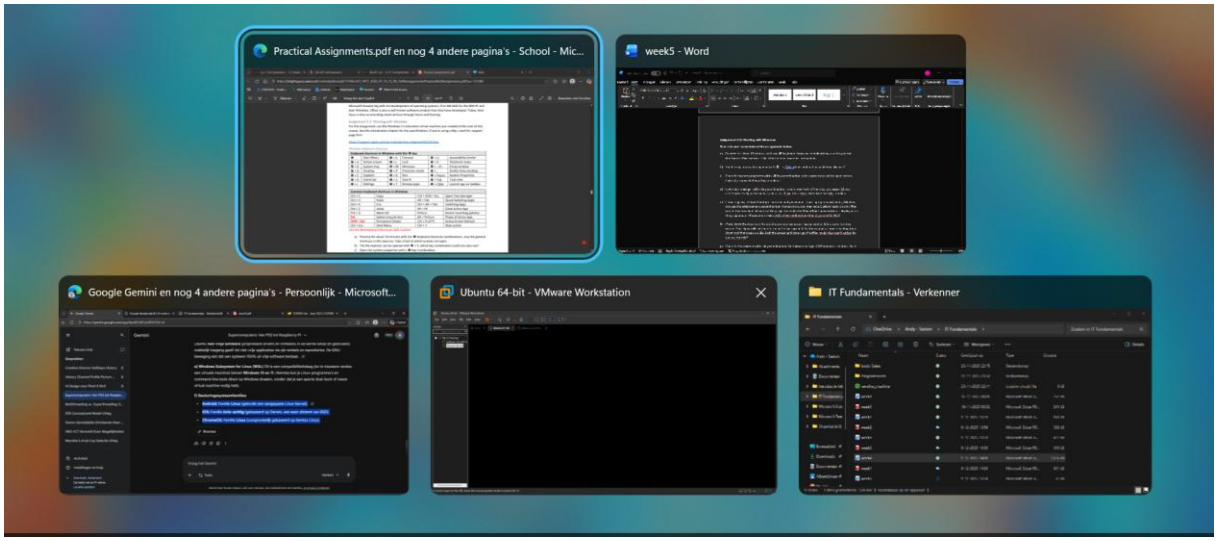
PS5 op FreeBSD, XBOX op eigen xbox os gebaseerd op windows

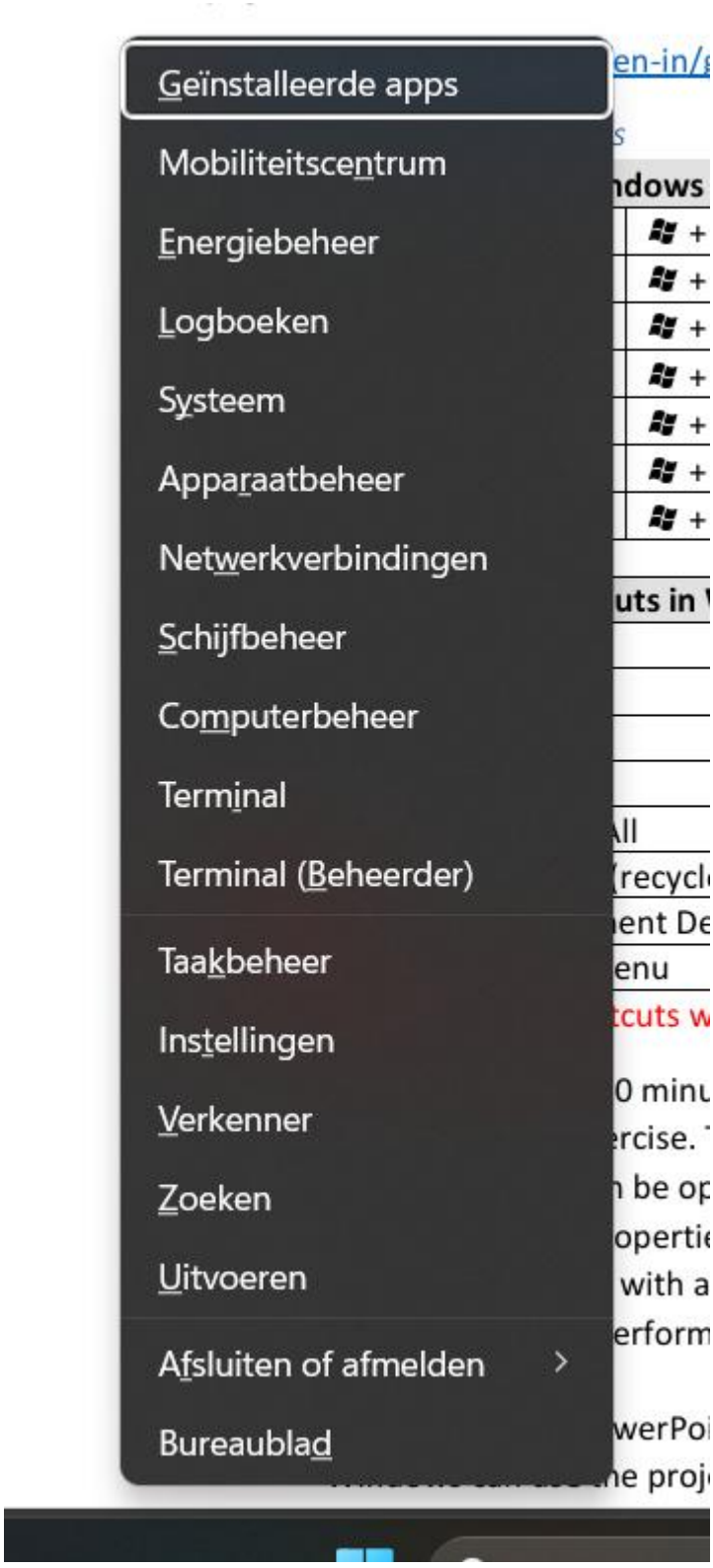
PS5 gebaseerd op unix achtig iets en XBOX op windows dus de software basis verschilt fundamenteel van elkaar

**Assignment 5.3: Working with Windows**

**Take relevant screenshots of the assignments below**

a) Practice for about 10 minutes with the ⊞ keyboard shortcuts combinations, skip the general shortcuts in this exercise. Take a look at which screens are opened.

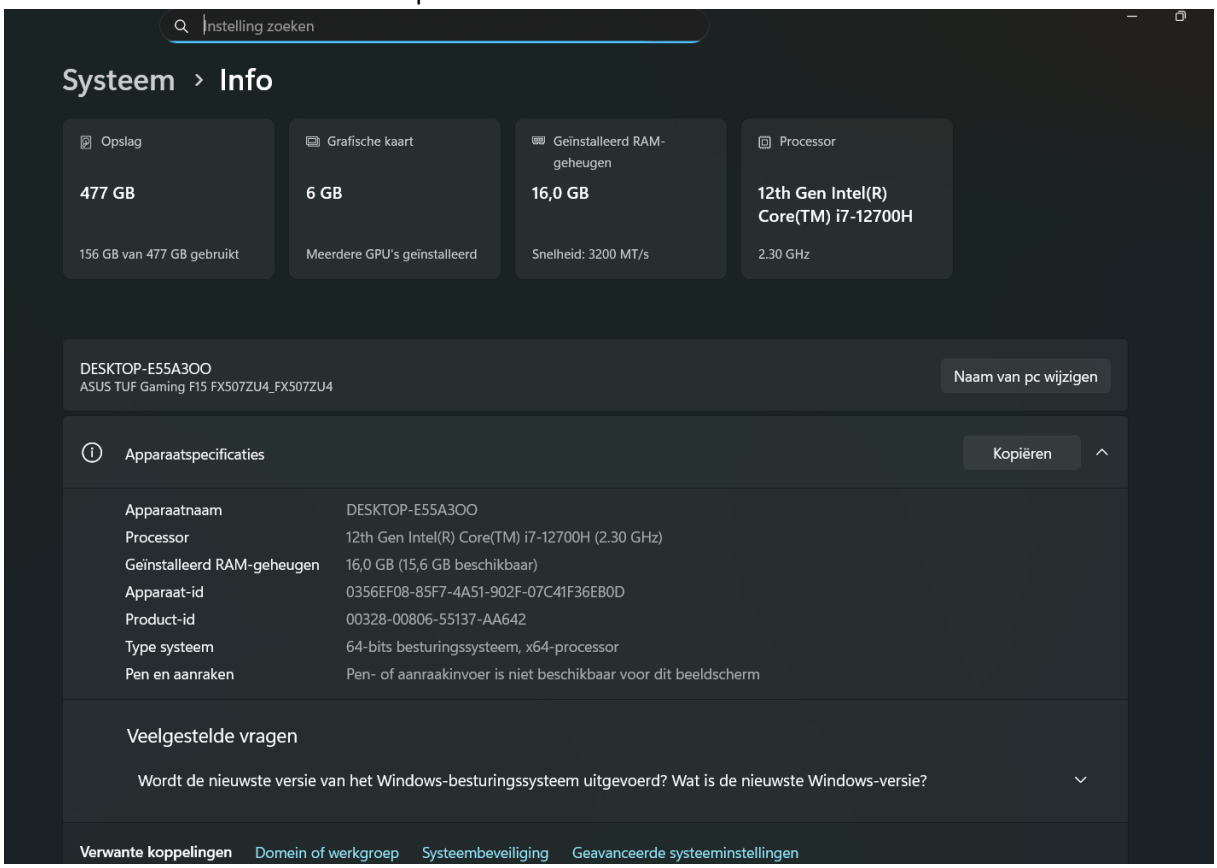





b) The file explorer can be opened with ⊞ + E, Which key combination could you also use?

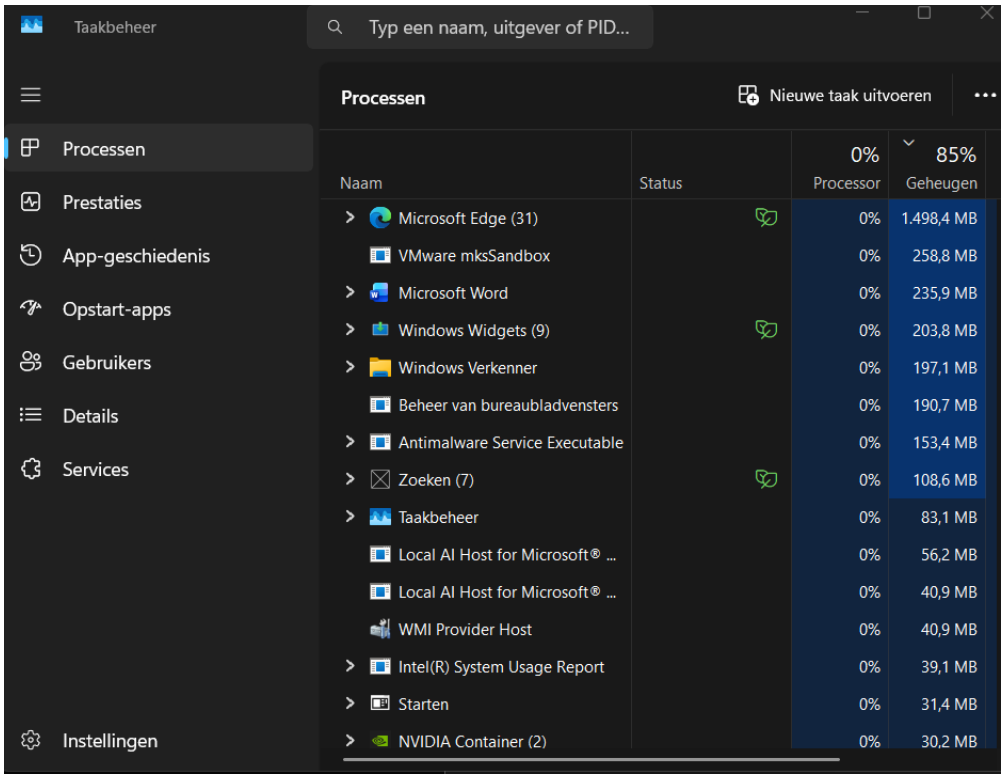
⊞ + R en dan explorer typen

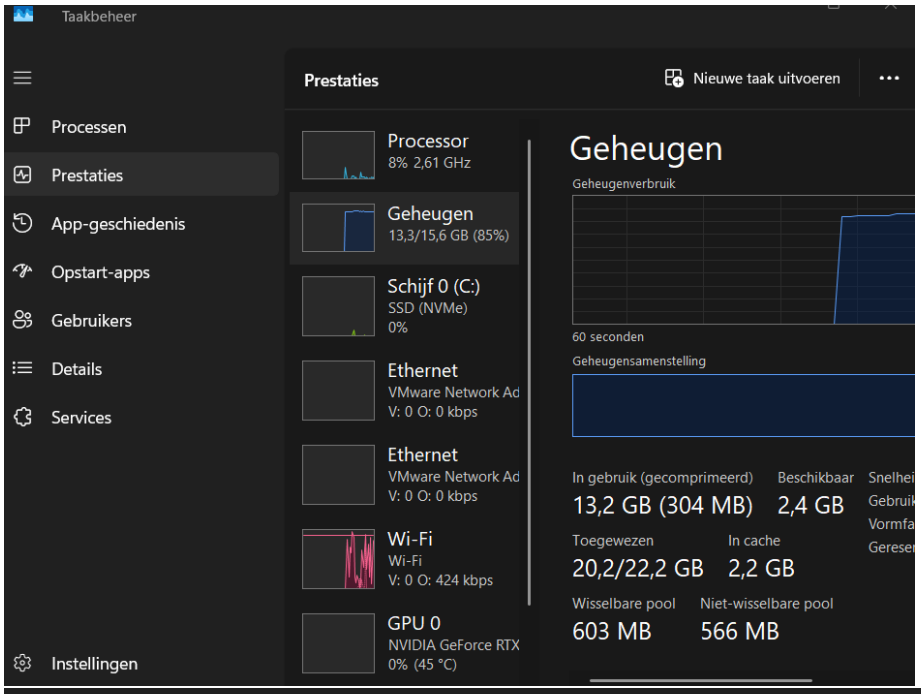
c) Open the system properties with a ⊞ key combination, take a screenshot of the open screen. Paste this screenshot into this template.

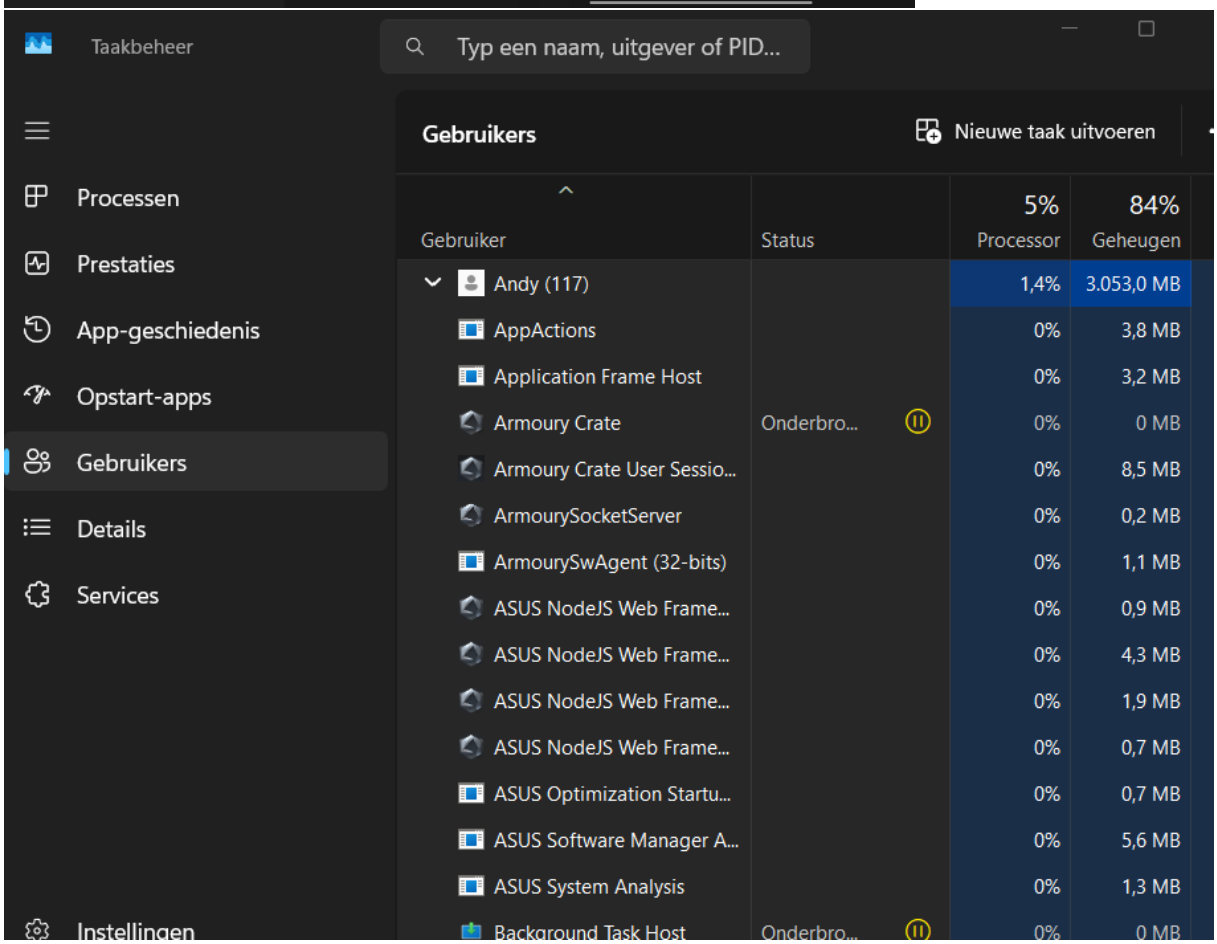



d) Open task manager with a key combination. Take screenshots of the tabs: processes (shows active processes), performance, and users. Place these three screenshots in this template.

CTRL + SHIFT + ESCAPE




Taakbeheer
Prestaties
Nieuwe taak uitvoeren
Processen
Prestaties
App-geschiedenis
Opstart-apps
Gebruikers
Details
Services
Instellingen
Processor
8% 2,61 GHz
Geheugen
13,3/15,6 GB (85%)
Schijf 0 (C:)
SSD (NVMe)
0%
Ethernet
VMware Network Ad
V: 0 O: 0 kbps
Ethernet
VMware Network Ad
V: 0 O: 0 kbps
Wi-Fi
Wi-Fi
V: 0 O: 424 kbps
GPU 0
NVIDIA GeForce RTX
0% (45 °C)
Geheugen
Geheugenverbruik
60 seconden
Geheugensamenstelling
In gebruik (gecomprimeerd)
13,2 GB (304 MB)
Beschikbaar
2,4 GB
Toegewezen
20,2/22,2 GB
In cache
2,2 GB
Wisselbare pool
603 MB
Niet-wisselbare pool
566 MB


Taakbeheer
Typ een naam, uitgever of PID...
Gebruikers
Nieuwe taak uitvoeren
Processen
Prestaties
App-geschiedenis
Opstart-apps
Gebruikers
Details
Services
Instellingen
Gebruiker
Status
5%
Processor
84%
Geheugen
Andy (117) 1,4% 3.053,0 MB
AppActions 0% 3,8 MB
Application Frame Host 0% 3,2 MB
Armoury Crate Onderbro... 0% 0 MB
Armoury Crate User Sessio... 0% 8,5 MB
ArmourySocketServer 0% 0,2 MB
ArmourySwAgent (32-bits) 0% 1,1 MB
ASUS NodeJS Web Frame... 0% 0,9 MB
ASUS NodeJS Web Frame... 0% 4,3 MB
ASUS NodeJS Web Frame... 0% 1,9 MB
ASUS NodeJS Web Frame... 0% 0,7 MB
ASUS Optimization Startu... 0% 0,7 MB
ASUS Software Manager A... 0% 5,6 MB
ASUS System Analysis 0% 1,3 MB
Background Task Host Onderbro... 0% 0 MB

e) If you're giving a PowerPoint presentation and you connect your laptop to a projector, Windows can use the projector as a second screen. For example, you may have Outlook open on your first screen that you don't show over the projector, while the PowerPoint presentation is displayed on the projector, or the second screen. Which key combination should you use for this?

Windows + P

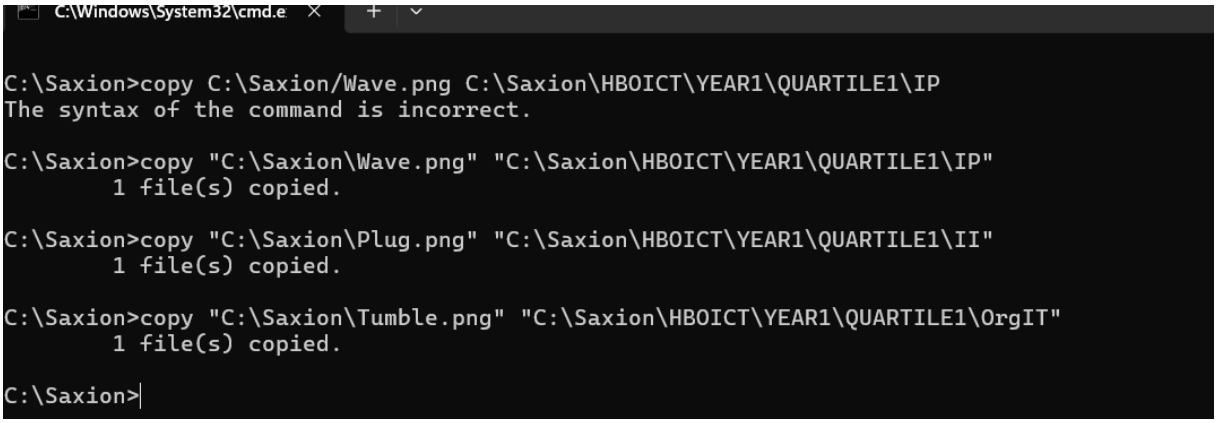
f) If you leave the classroom for a while and you leave your laptop behind, it is wise to lock the screen. Your Apps will continue to run in the background. So, for example, if you're waiting for a download that takes a while, lock the screen and get a cup of coffee. Which key combination do you use for this?

Windows + L

g) Open the Run screen with a key combination. On this screen, type CMD and press <enter>. Take a screenshot of this result and paste it into this template.

**Working in the File Explorer**

Relevant screenshots **copy** command:

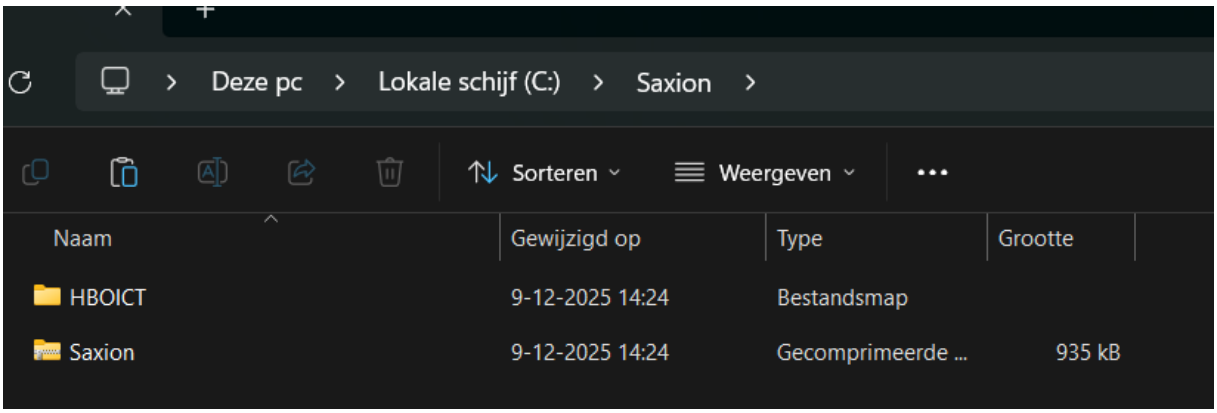



Relevant screenshots **tree** command:

```
C:\Saxion>tree
Folder PATH listing
Volume serial number is 6280-B5CA
C:.
├───HBOICT
│   ├───YEAR1
│   │   ├───QUARTILE1
│   │   │   ├───II
│   │   │   ├───IP
│   │   │   └───OrgIT
│   │   ├───QUARTILE2
│   │   ├───QUARTILE3
│   │   └───QUARTILE4
│   ├───YEAR2
│   │   ├───QUARTILE1
│   │   ├───QUARTILE2
│   │   ├───QUARTILE3
│   │   └───QUARTILE4
│   ├───YEAR3
│   │   ├───QUARTILE1
│   │   ├───QUARTILE2
│   │   ├───QUARTILE3
│   │   └───QUARTILE4
```

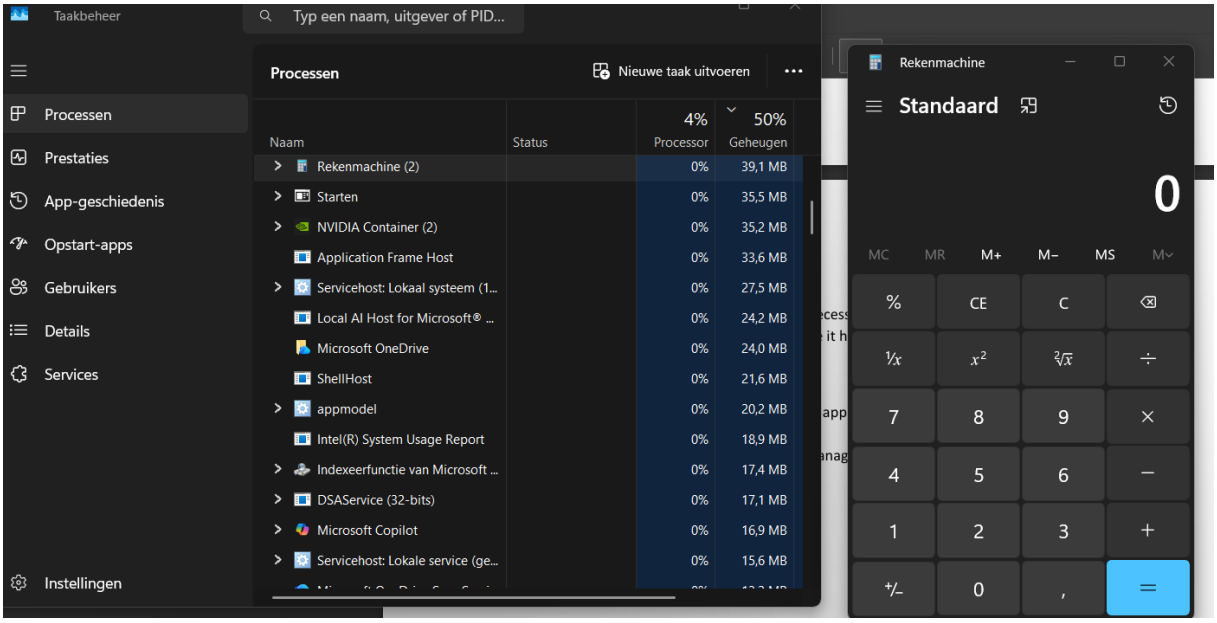
```
C:\Saxion>echo %username%
Andy
```

Relevant screenshots in the file explorer of the folder c:\Saxion + created zip file.



## Terminating Processes

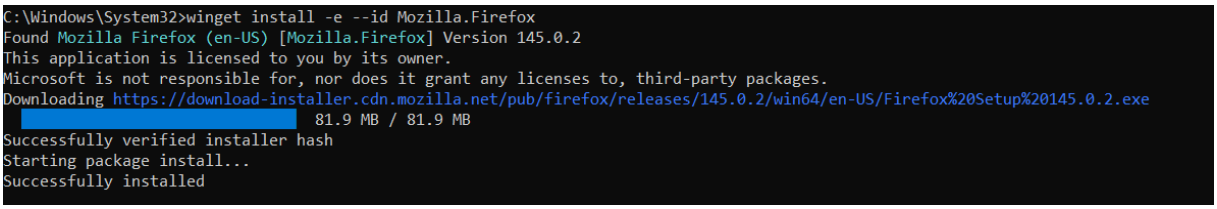
Relevant Screenshots Task Manager Window:

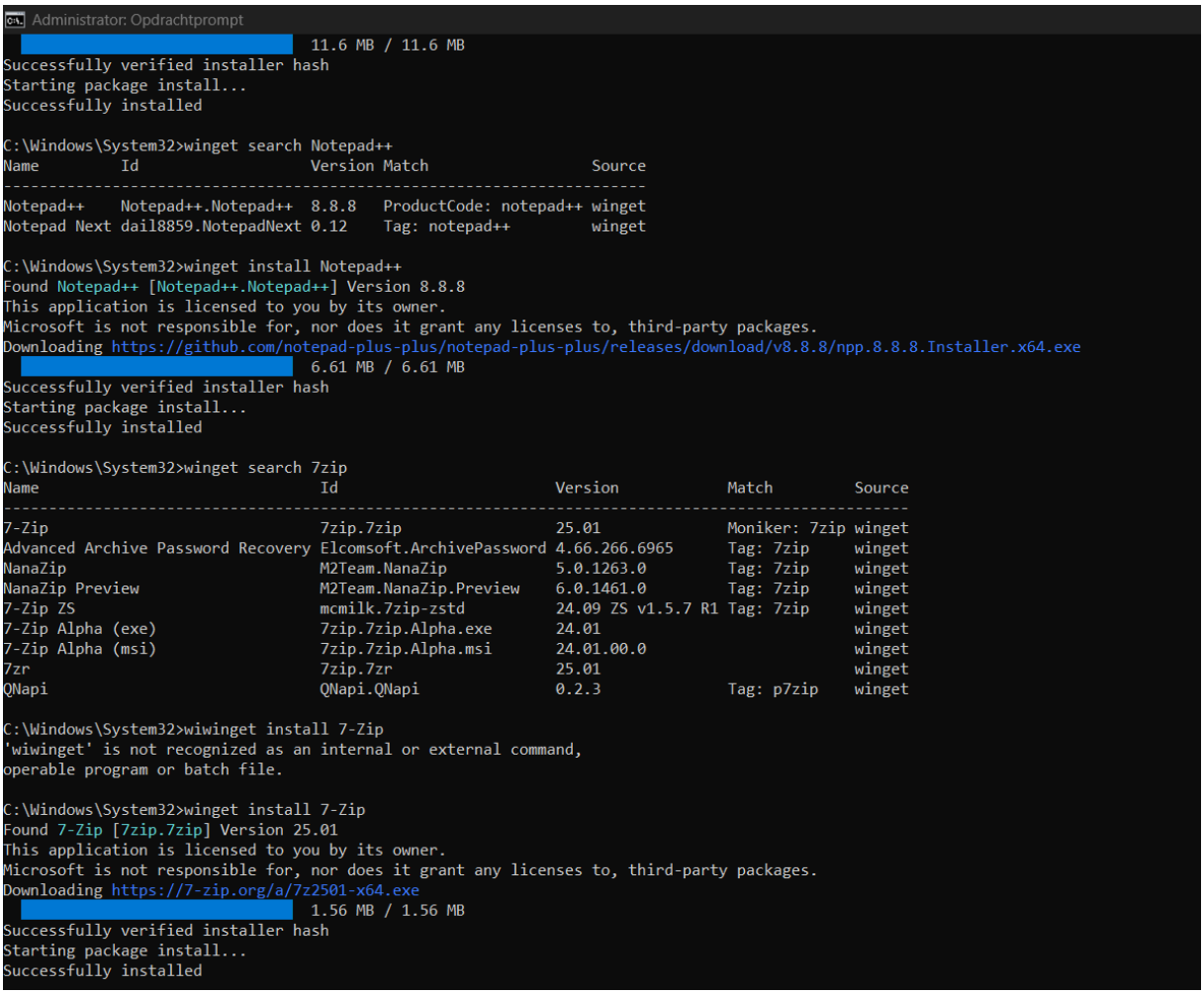



## Install Software

Relevant screenshots that the following software is installed with winget:

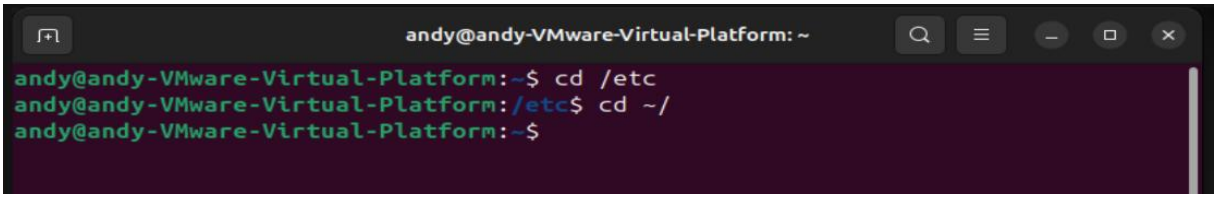
- WinSCP
- Notepad++
- 7zip

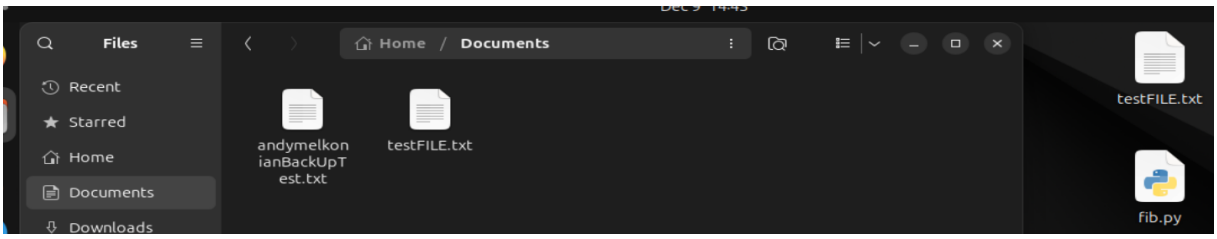


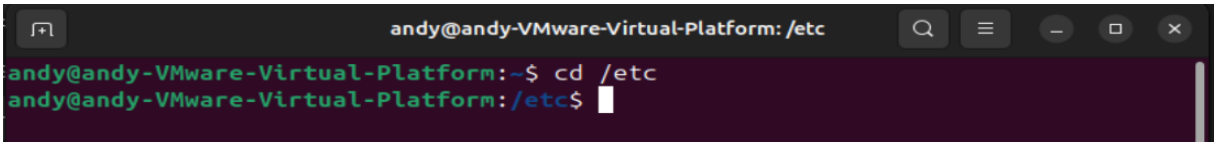

Administrator: Opdrachtprompt
11.6 MB / 11.6 MB
Successfully verified installer hash
Starting package install...
Successfully installed
C:\Windows\System32>winget search Notepad++
Name Id Version Match Source
Notepad++ Notepad++.Notepad++ 8.8.8 ProductCode: notepad++ winget
Notepad Next dail8859.NotepadNext 0.12 Tag: notepad++ winget
C:\Windows\System32>winget install Notepad++
Found Notepad++ [Notepad++.Notepad++] Version 8.8.8
This application is licensed to you by its owner.
Microsoft is not responsible for, nor does it grant any licenses to, third-party packages.
Downloading https://github.com/notepad-plus-plus/notepad-plus-plus/releases/download/v8.8.8/npp.8.8.8.Installer.x64.exe
6.61 MB / 6.61 MB
Successfully verified installer hash
Starting package install...
Successfully installed
C:\Windows\System32>winget search 7zip
Name Id Version Match Source
7-Zip 7zip.7zip 25.01 Moniker: 7zip winget
Advanced Archive Password Recovery Elcomsoft.ArchivePassword 4.66.266.6965 Tag: 7zip winget
NanaZip M2Team.NanaZip 5.0.1263.0 Tag: 7zip winget
NanaZip Preview M2Team.NanaZip.Preview 6.0.1461.0 Tag: 7zip winget
7-Zip ZS mcmilk.7zip-zstd 24.09 ZS v1.5.7 R1 Tag: 7zip winget
7-Zip Alpha (exe) 7zip.7zip.Alpha.exe 24.01 winget
7-Zip Alpha (msi) 7zip.7zip.Alpha.msi 24.01.00.0 winget
7zr 7zip.7zr 25.01 winget
QNapi QNapi.QNapi 0.2.3 Tag: p7zip winget
C:\Windows\System32>wiwinget install 7-Zip
'wiwinget' is not recognized as an internal or external command,
operable program or batch file.
C:\Windows\System32>winget install 7-Zip
Found 7-Zip [7zip.7zip] Version 25.01
This application is licensed to you by its owner.
Microsoft is not responsible for, nor does it grant any licenses to, third-party packages.
Downloading https://7-zip.org/a/7z2501-x64.exe
1.56 MB / 1.56 MB
Successfully verified installer hash
Starting package install...
Successfully installed

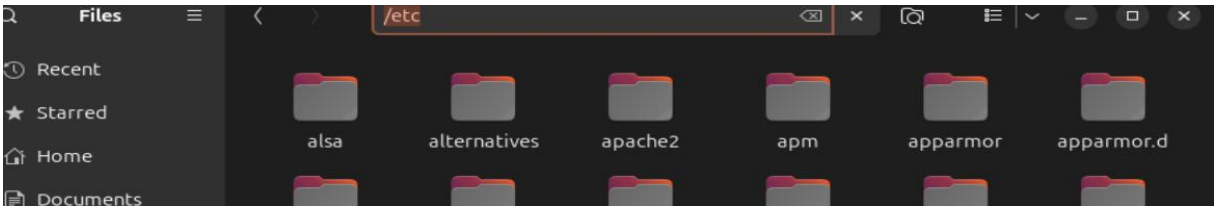
**Assignment 5.4: Working with Linux**

Relevant screenshots + motivation



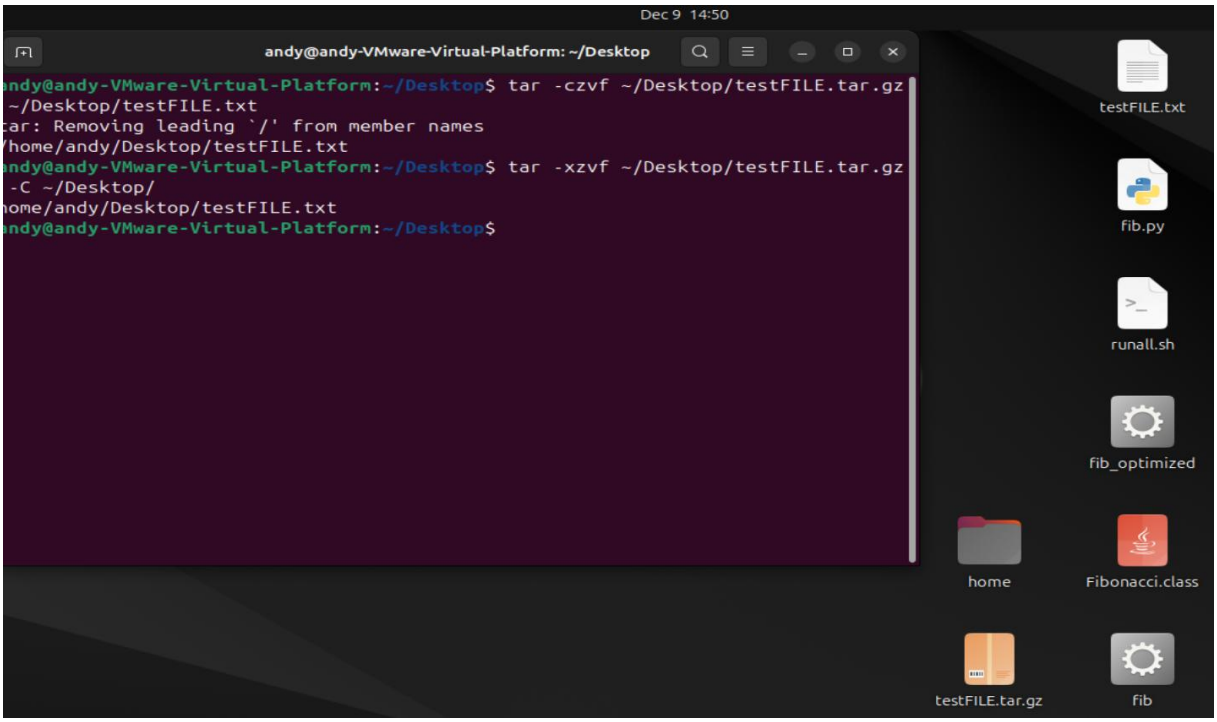



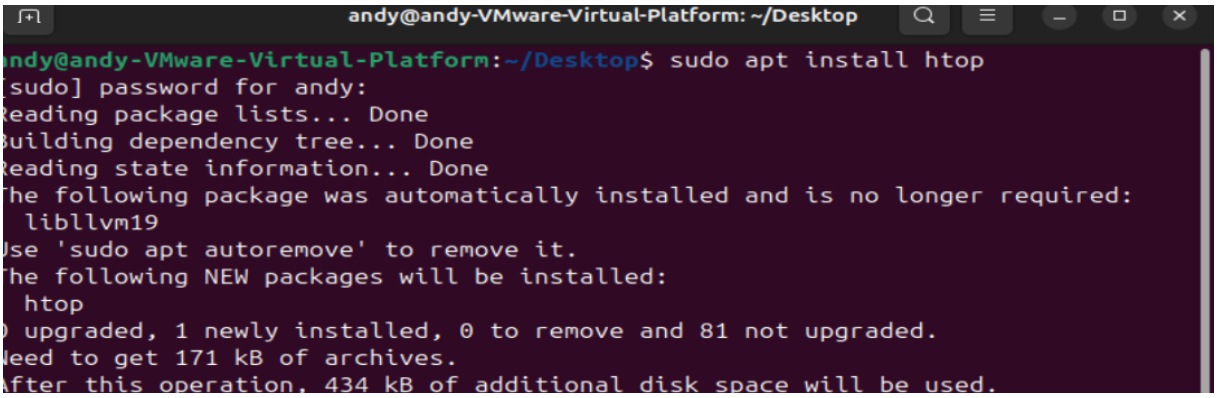

Het verschil is dat het tree based is ipv driver based, windows heeft gewoon :C, :D etc en ubuntu niet het is allemaal 1 grote tree.

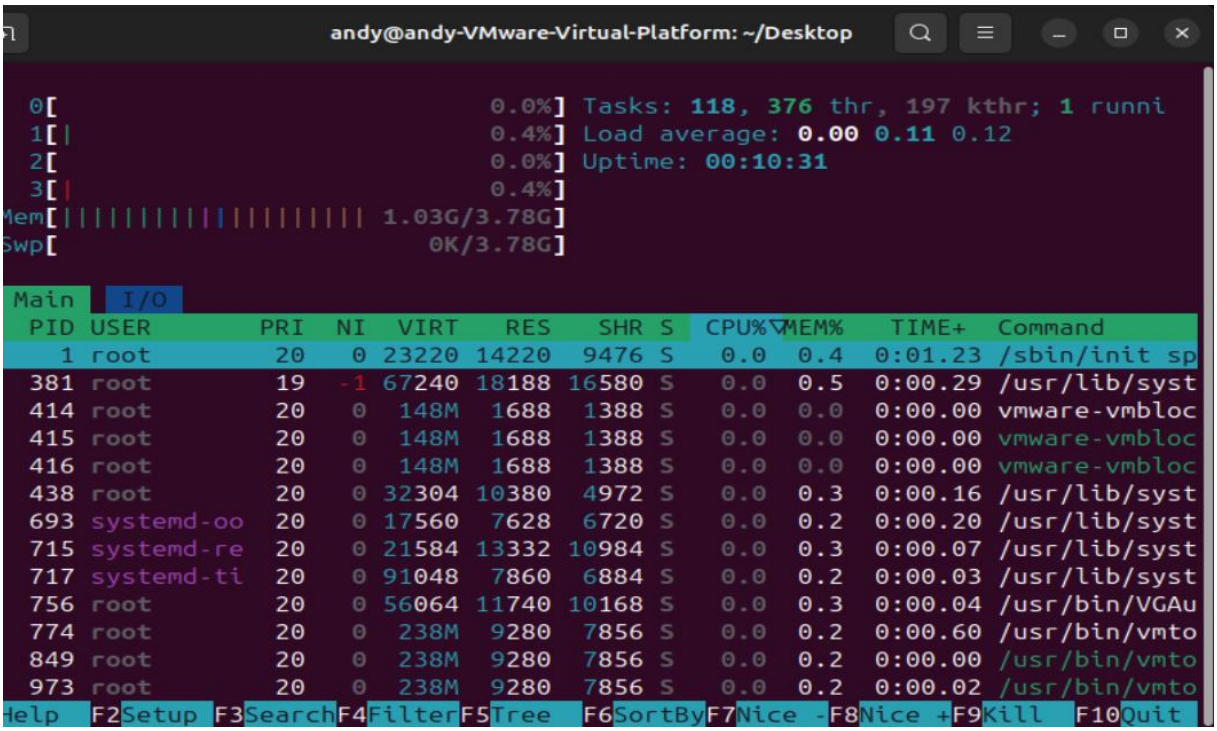
/etc is de centrale plek voor configuratie bestanden voor het gedrag van het systeem en de applicaties, het is dus erg belangrijk

tar -cvf archiefnaam.tar bestandsnaam.txt (comprimeren)

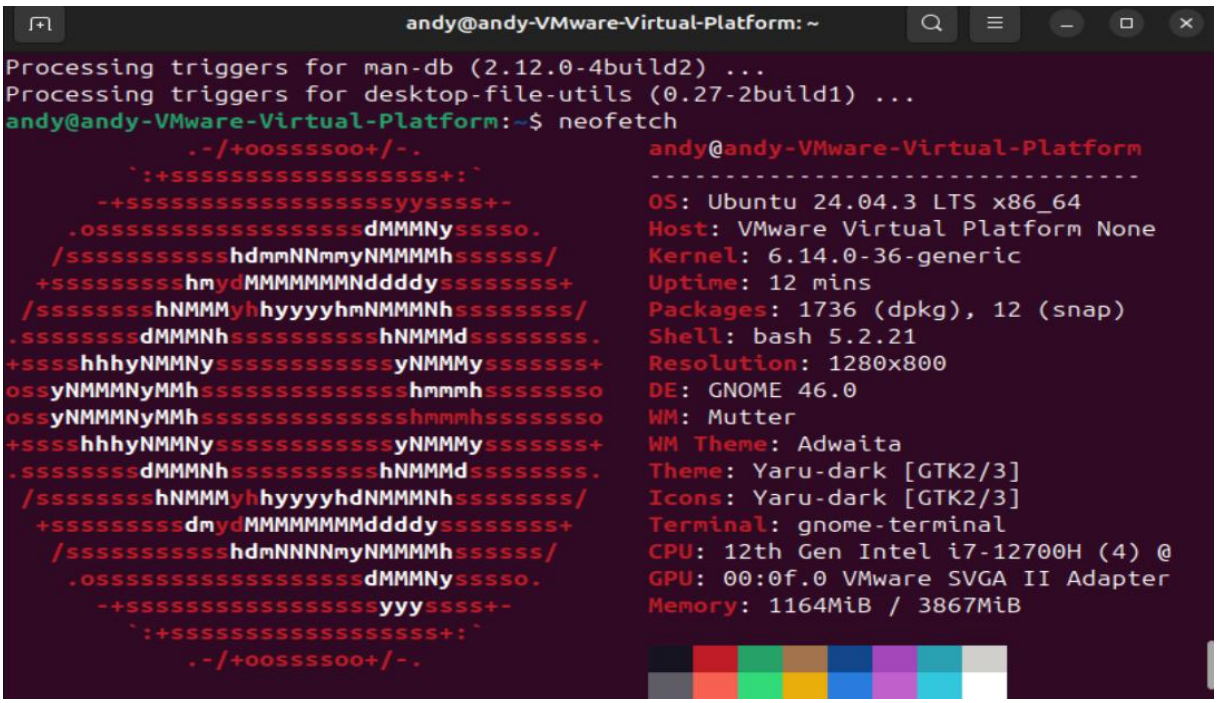
tar -xvf archiefnaam.tar (uitpakken)


Dec 9 14:50
andy@andy-VMware-Virtual-Platform: ~/Desktop
ndy@andy-VMware-Virtual-Platform:~/Desktop$ tar -czvf ~/Desktop/testFILE.tar.gz
~/Desktop/testFILE.txt
ar: Removing leading `/' from member names
/home/andy/Desktop/testFILE.txt
ndy@andy-VMware-Virtual-Platform:~/Desktop$ tar -xzvf ~/Desktop/testFILE.tar.gz
-C ~/Desktop/
ome/andy/Desktop/testFILE.txt
ndy@andy-VMware-Virtual-Platform:~/Desktop$
testFILE.txt
fib.py
runall.sh
fib_optimized
home
Fibonacci.class
testFILE.tar.gz
fib


andy@andy-VMware-Virtual-Platform: ~/Desktop
ndy@andy-VMware-Virtual-Platform:~/Desktop$ sudo apt install htop
[sudo] password for andy:
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following package was automatically installed and is no longer required:
libllvm19
Use 'sudo apt autoremove' to remove it.
The following NEW packages will be installed:
htop
0 upgraded, 1 newly installed, 0 to remove and 81 not upgraded.
Need to get 171 kB of archives.
After this operation, 434 kB of additional disk space will be used.




Htop is een systeemmonitor voor linux systeem het word gebruikt om real time processen in te zien, eigenlijk een soort taakbeheer

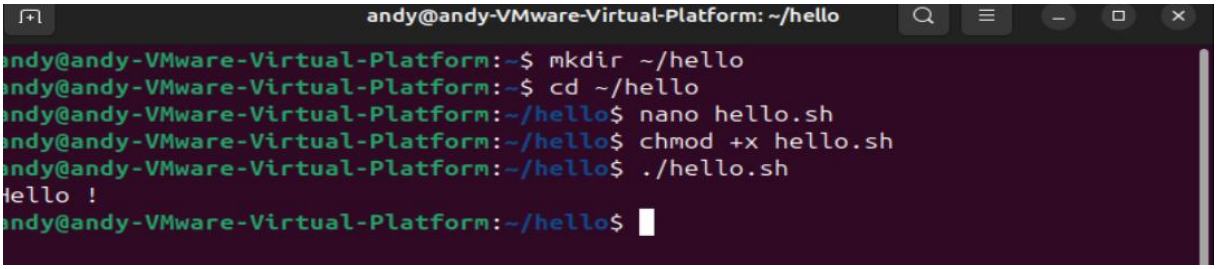



**cat**Toont de **volledige inhoud** van een bestand in de terminal

**wc** Telt het aantal **regels, woorden en bytes** in een bestand

**Assignment 5.5: Users and permissions on Linux**

Relevant screenshots + motivation




**Assignment 5.6: View the contents of files**

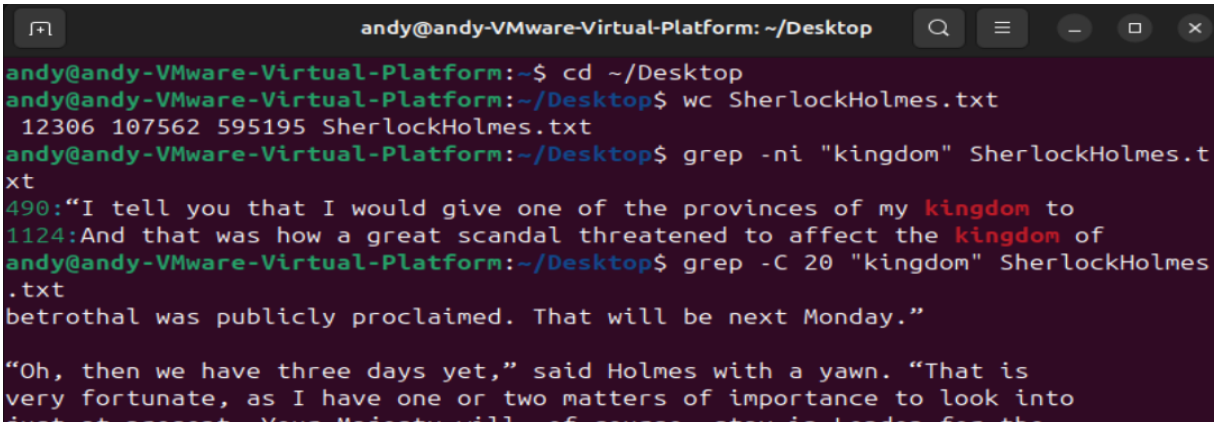
Relevant screenshots + motivation

**less** Hiermee kunt u **grote bestanden** pagina voor pagina bekijken en scrollen.

**Tail** Toont de **laatste** 10 regels van een bestand.

**Head** Toont de **eerste** 10 regels van een bestand.

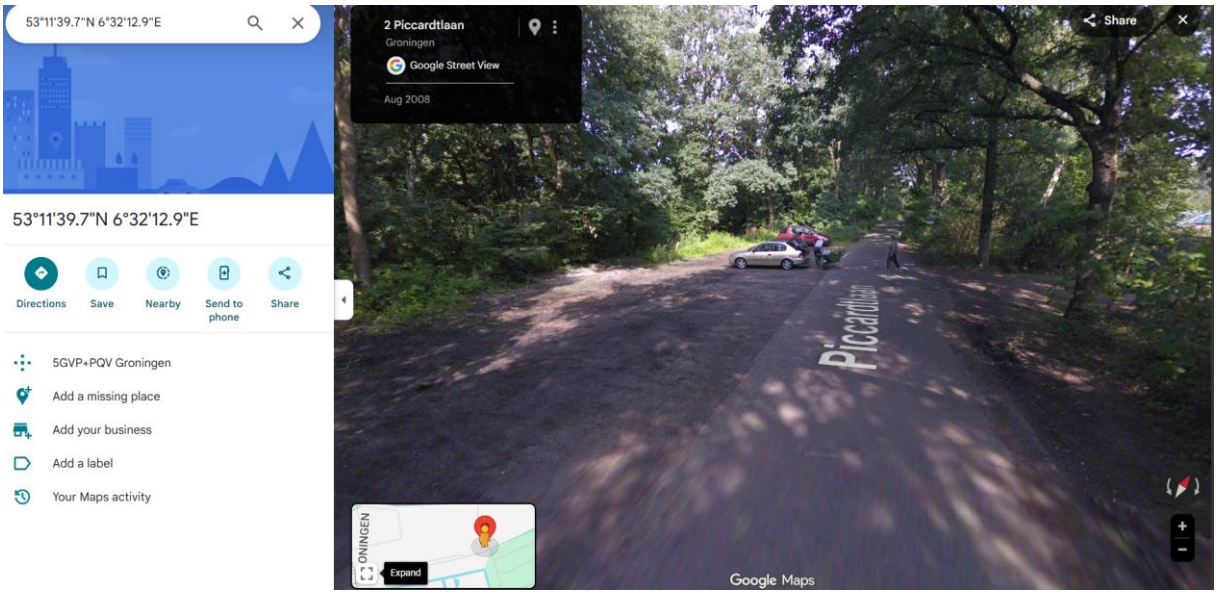
**Grep** Zoekt naar een specifiek **tekstpatroon** of een woord binnen de inhoud van een bestand



**Assignment 5.7: Digital forensics**

Relevant screenshots + motivation

```
GPS Altitude                    : 42 m Above Sea Level
GPS Date/Time                   : 2020:11:07 14:08:57Z
GPS Latitude                    : 53 deg 11' 39.68" N
GPS Longitude                   : 6 deg 32' 12.90" E
Focal Length                    : 3.5 mm
GPS Position                    : 53 deg 11' 39.68" N, 6 deg 32' 12.90" E
Light Value                     : 7.7
andy@andy-VMware-Virtual-Platform:~/Desktop$ ^C
```



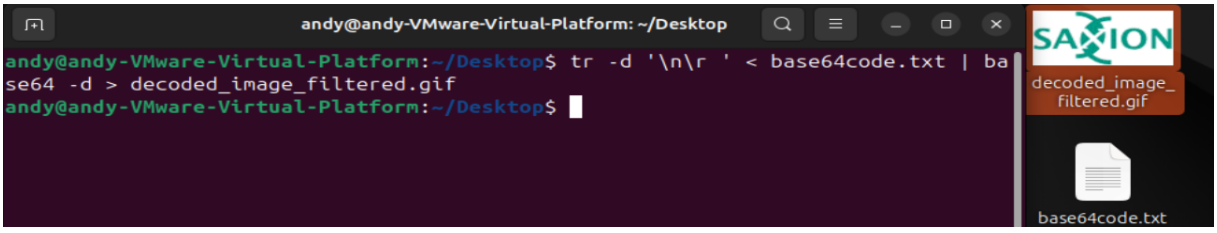

Groningen

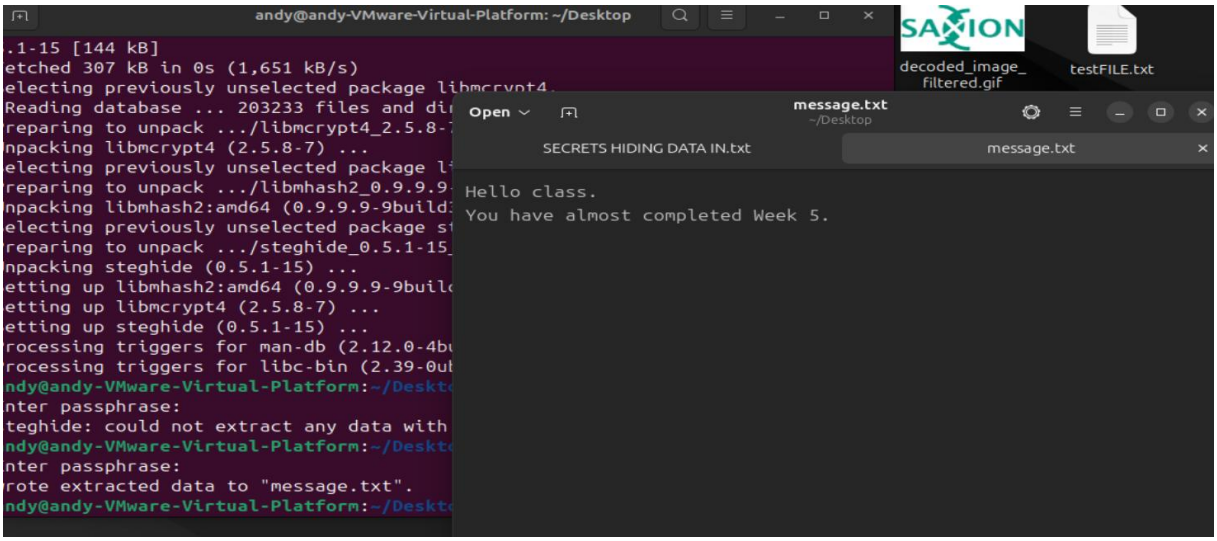
```
andy@andy-VMware-Virtual-Platform:~/Desktop$ mv oldcar.jpg oldcar
andy@andy-VMware-Virtual-Platform:~/Desktop$ file oldcar
oldcar: JPEG image data, JFIF standard 1.01, aspect ratio, density 1x1, segment
length 16, Exif Standard: [TIFF image data, big-endian, direntries=10, manufactu
rer=motorola, model=moto g(6) play, xresolution=160, yresolution=168, resolutio
unit=2, software=aljeter-user 9 PPPS29.55-35-18-7 6a0d0 release-keys, datetime=2
020:11:07 15:08:57, GPS-Data], baseline, precision 8, 4160x3120, components 3
andy@andy-VMware-Virtual-Platform:~/Desktop$
```

Ja word nog steeds als JPEG gezien

**Assignment 5.8: Steganography**

Relevant screenshots + motivation

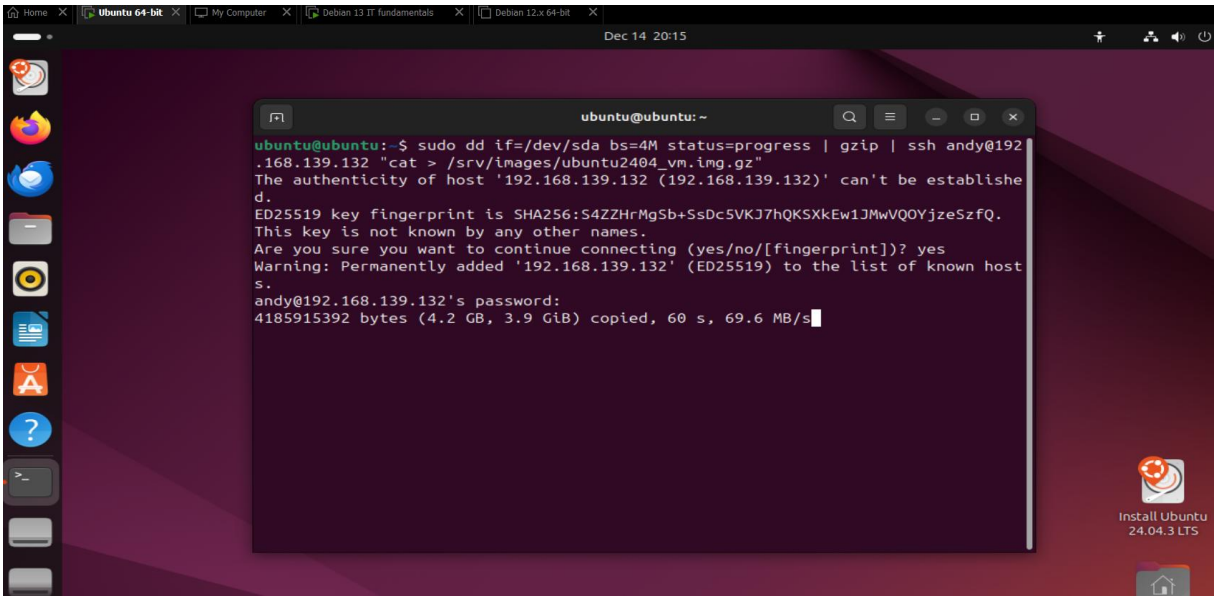


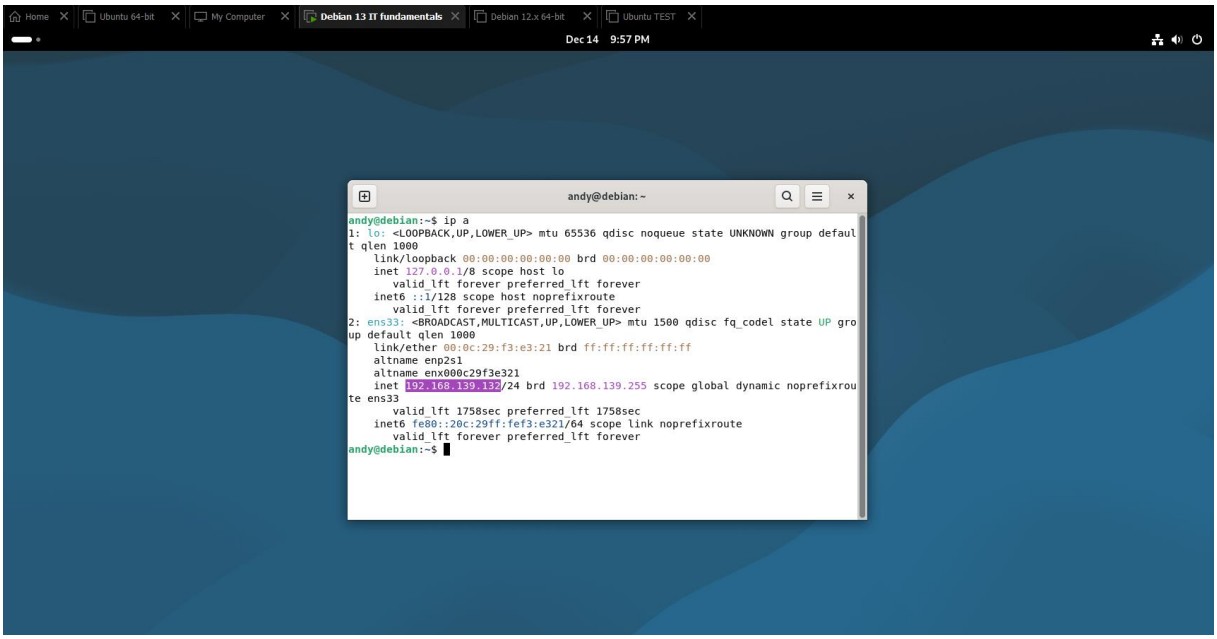


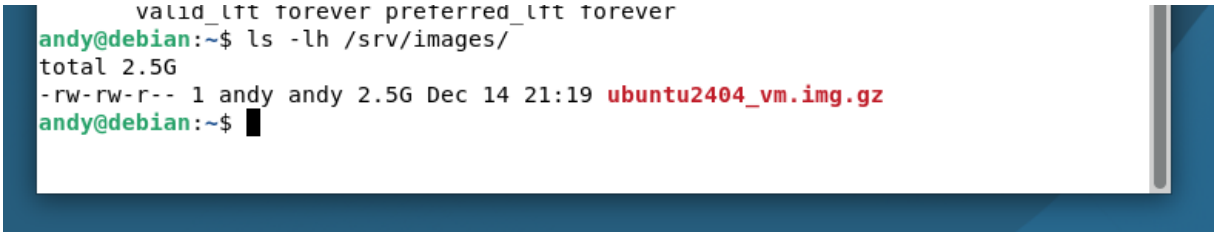

**Assignment 5.9: Capture disk images**

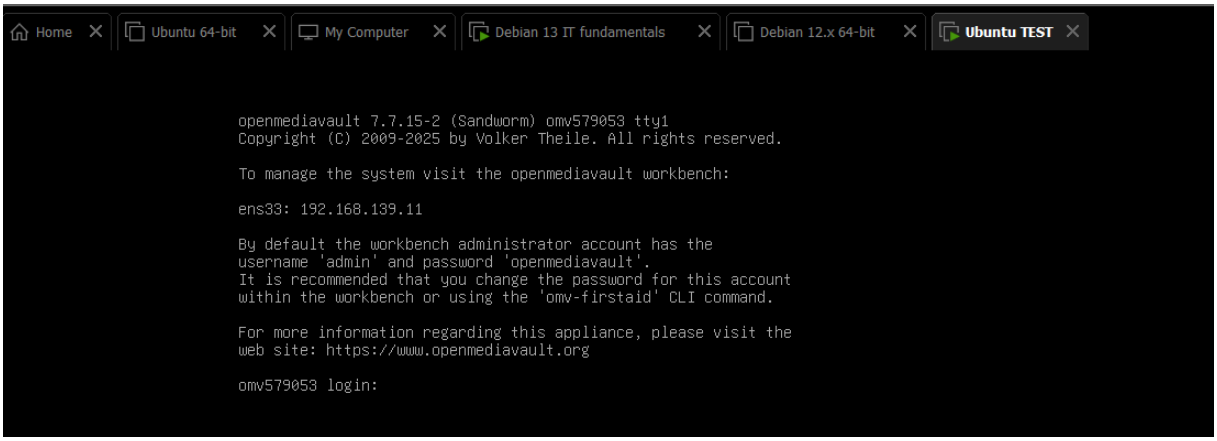
Make relevant screenshots + motivation:

- Proof that the Debian 13 server stored a back-up image of the Ubuntu 24.04 Desktop VM.
- Proof that you can restore the back-up image into an empty VM.






De opdracht om de gecomprimeerde image via SSH en dd te **capturen** en te **restoren** is **technisch succesvol**. Het volledige Ubuntu-image is van de server naar de harde schijf van de nieuwe VM geschreven. De restore is echter uitgevoerd naar een **virtuele harde schijf (.vmdk)** die oorspronkelijk toebehoorde aan een **Debian/OpenMediaVault server**, wat leidde tot een conflict in de opstartvolgorde van de VM (waardoor de Debian-bootmelding verscheen in plaats van de Ubuntu-bootloader).

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