Template Week 5 – Operating Systems

Student number: 573190

Assignment 5.1: Unix-like

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

Unix-like are known for their stability, security, and most powerful command line interfaces. While unix systems are known for their user friendliness.

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.

c) What is the philosophy of the GNU movement?
It centers around the software freedom.

d) Does Ubuntu as a Linux operating system conform to the philosophy of the GNU movement? Please explain your answer.
Ubuntu as a Linux operating system conforms to the philosophy of the GNU movement, because Ubuntu offers free and opensource software.

e) Find out what is the Windows Subsystem for Linux?
The windows subsystem is a feature that allows you to run a linux environment diretely on windows without needing a virtual environment.

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

All of them belong to the unix-like family.

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
Supercomputers are powerful computing machines used for a variety of complex tasks that require immense computational power. They are mostly used for scientific research, engineering, healthcare, finance and national security.

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?

A playstation 3 cluster is a computer primarly composed of playstation 3 videogame consoles. PlayStation 3 clusters have been used in various high-performance computing applications due to their powerful IBM Cell CPUs.

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 supercomputer in the world? Make a logical decision for this, without going through the entire list.
https://www.top500.org/lists/top500/list/2023/06/
It does not appear in the list

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?

CPU Architecture

PlayStation 5: The PlayStation 5 uses a custom AMD Zen 2 CPU with 8 cores and 16 threads1.

Xbox Series X: The Xbox Series X also uses a custom AMD Zen 2 CPU with 8 cores and 16 threads2.

Operating Systems

PlayStation 5: The PlayStation 5 runs on a proprietary operating system called Orbis OS, which is based on FreeBSD3.

Xbox Series X: The Xbox Series X runs on a custom operating system based on the Windows kernel, incorporating DirectX features optimized for the console4.

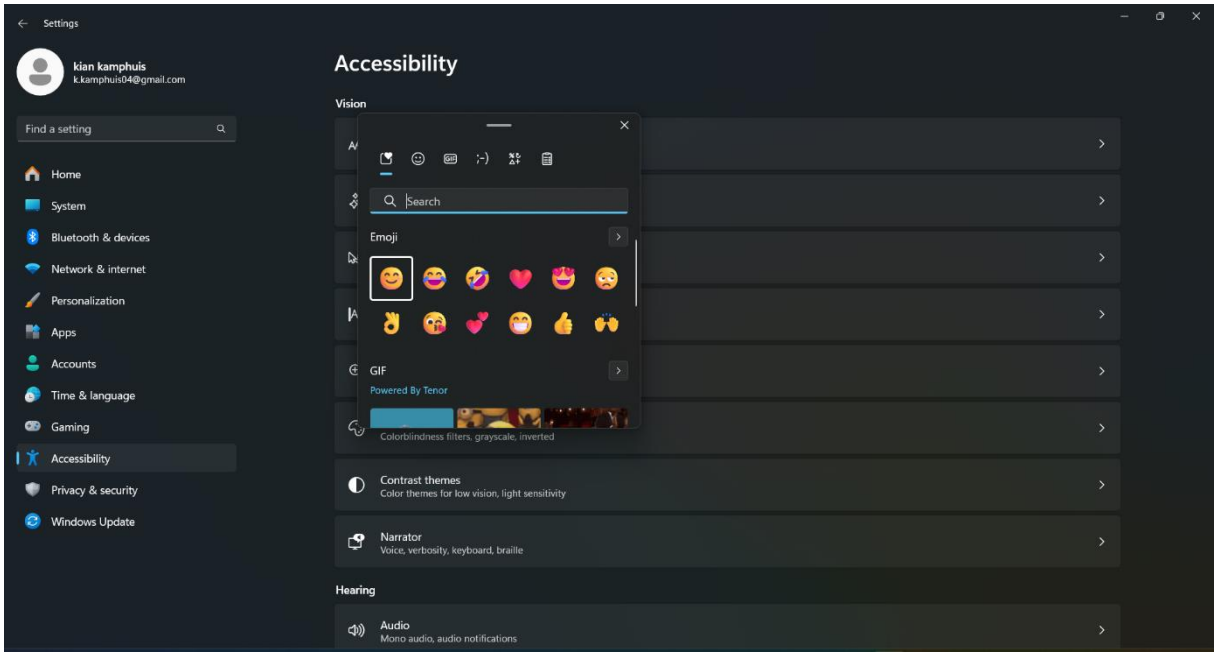
Conclusion

Both the PlayStation 5 and Xbox Series X use similar CPU architectures (custom AMD Zen 2), but they run on different operating systems. The PlayStation 5 uses a Unix-like OS (FreeBSD-based), while the Xbox Series X uses a Windows-based OS. This difference reflects the companies' broader strategies: Sony leverages a Unix-like system for its gaming consoles, while Microsoft integrates its console ecosystem more closely with its Windows platform, potentially offering better synergy with PC gaming and other Windows-based services.

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.

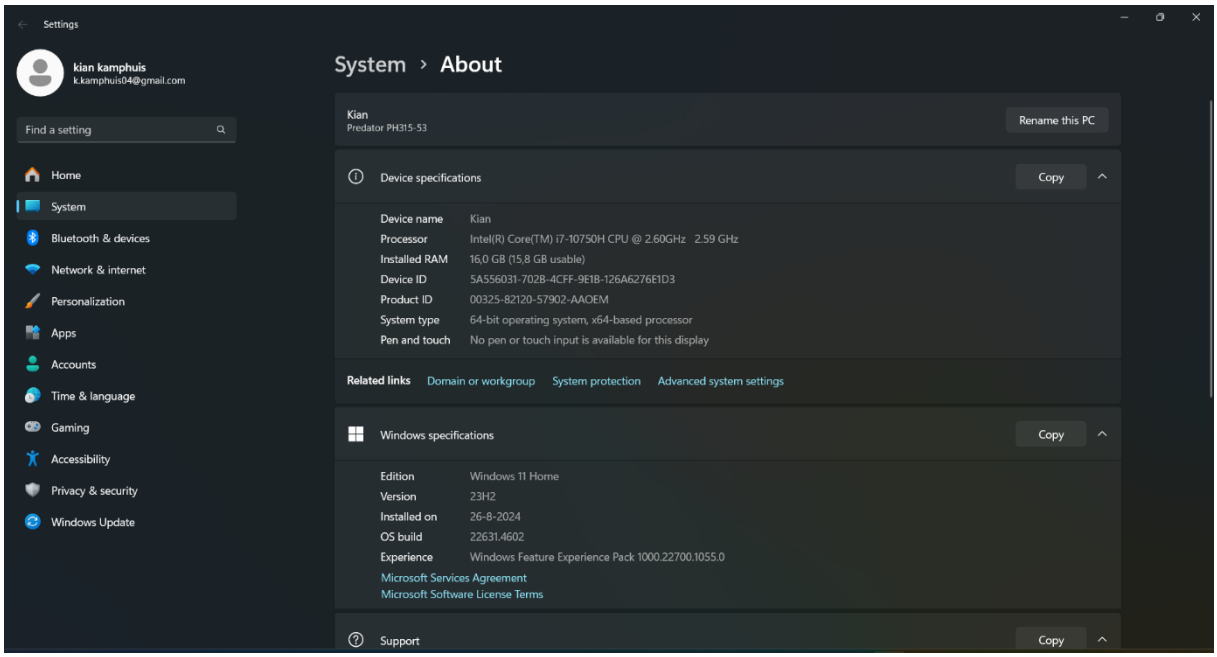


b) The file explorer can be opened with ⊞ + E, Which key combination could you also use?

Windows key + X and E

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

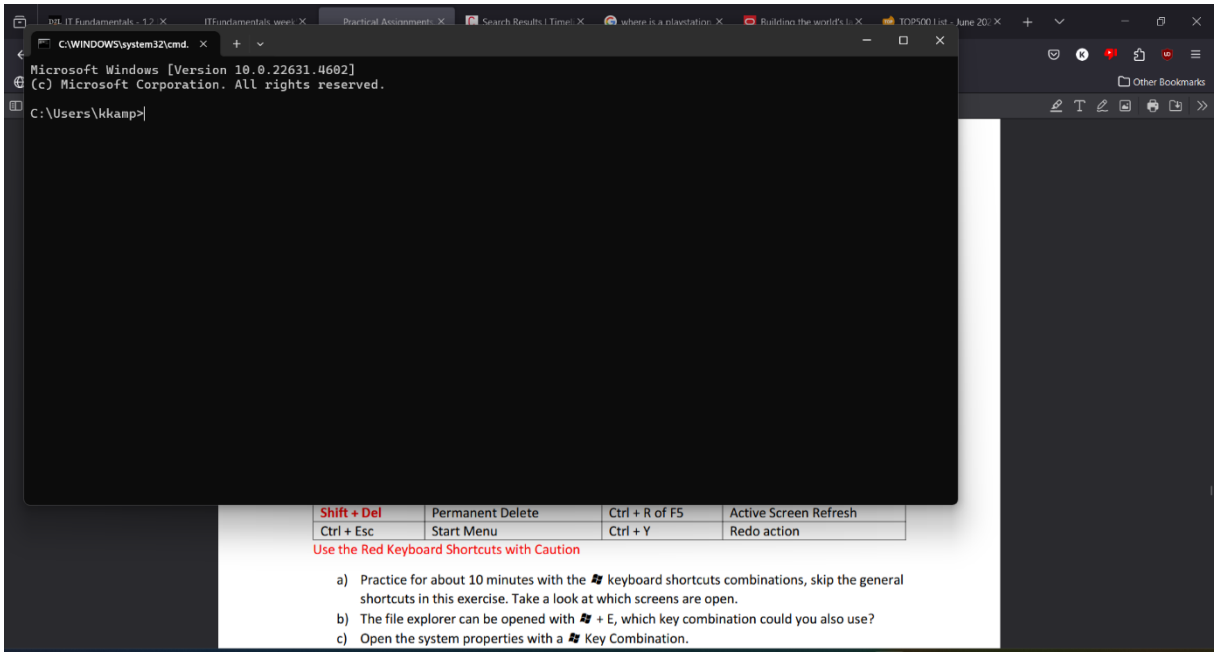
d) Open task manager with a key combination. Take screenshots of the tabs: processes (shows active processes), performance, and users. Place these three screenshots in this template.



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 key + P

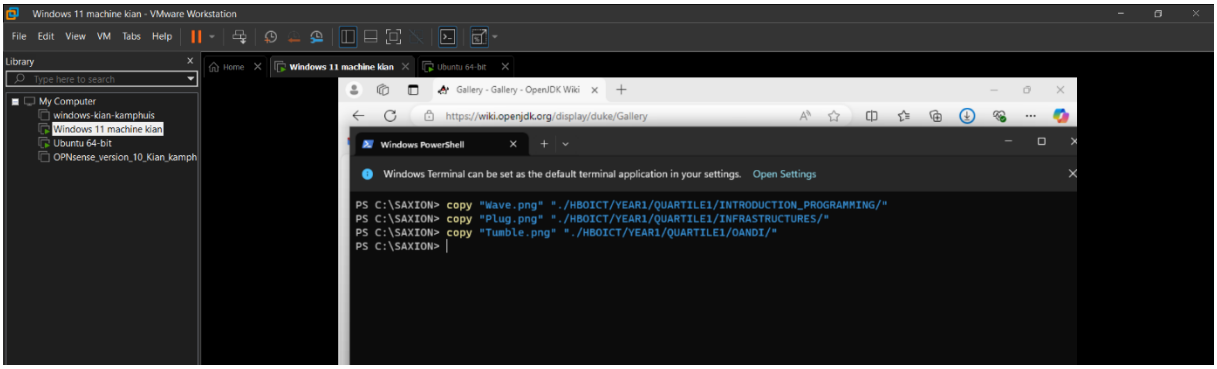
f) If you leave the classroom for a while and you leave your laptop behind, it is wise to lock the screen. Your Apps will continue to run in the background. So, for example, if you're waiting for a download that takes a while, lock the screen and get a cup of coffee. Which key combination do you use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

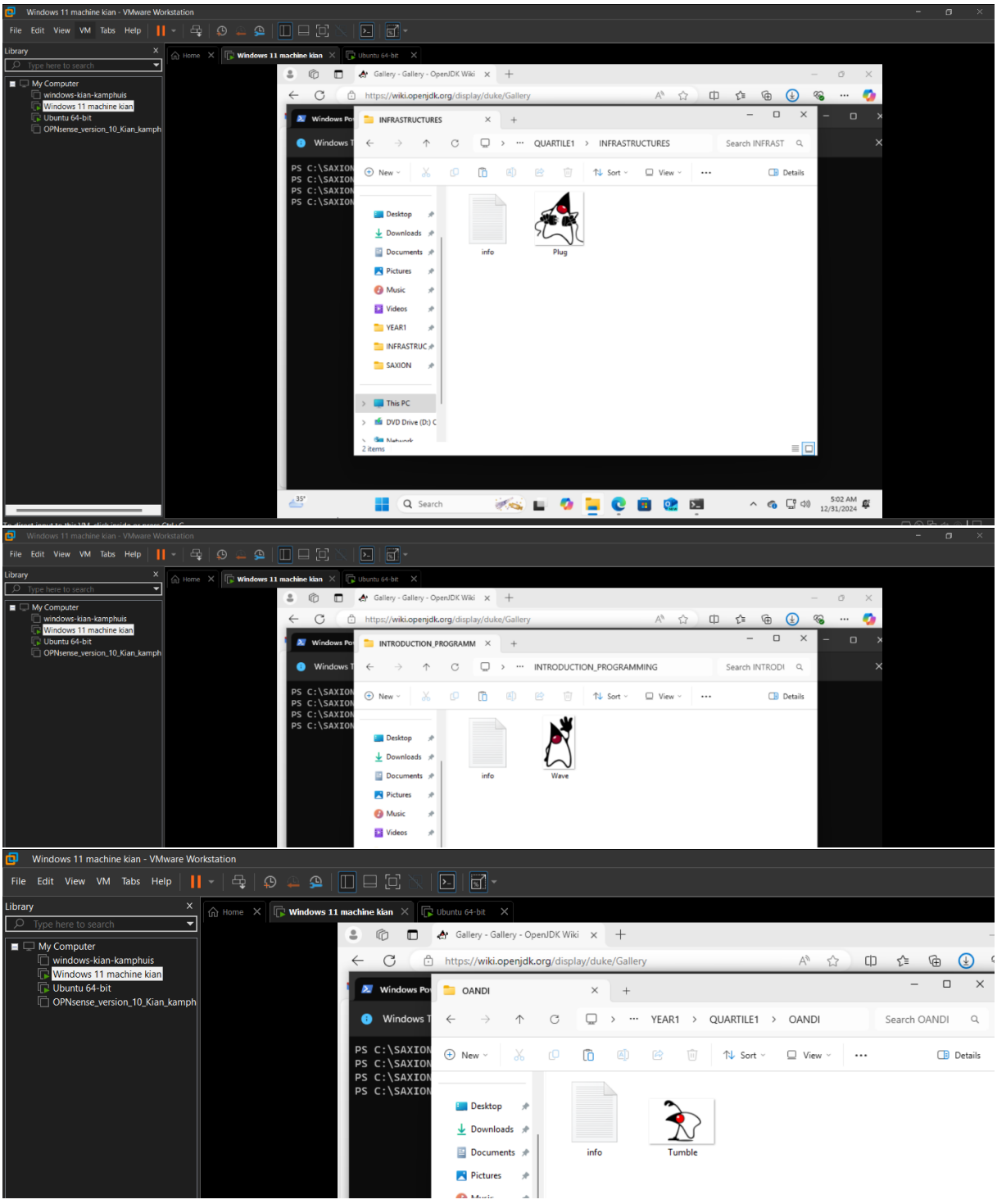
g) Open the Run screen with a key combination. On this screen, type CMD and press <enter>. Take a screenshot of this result and paste it into this template.



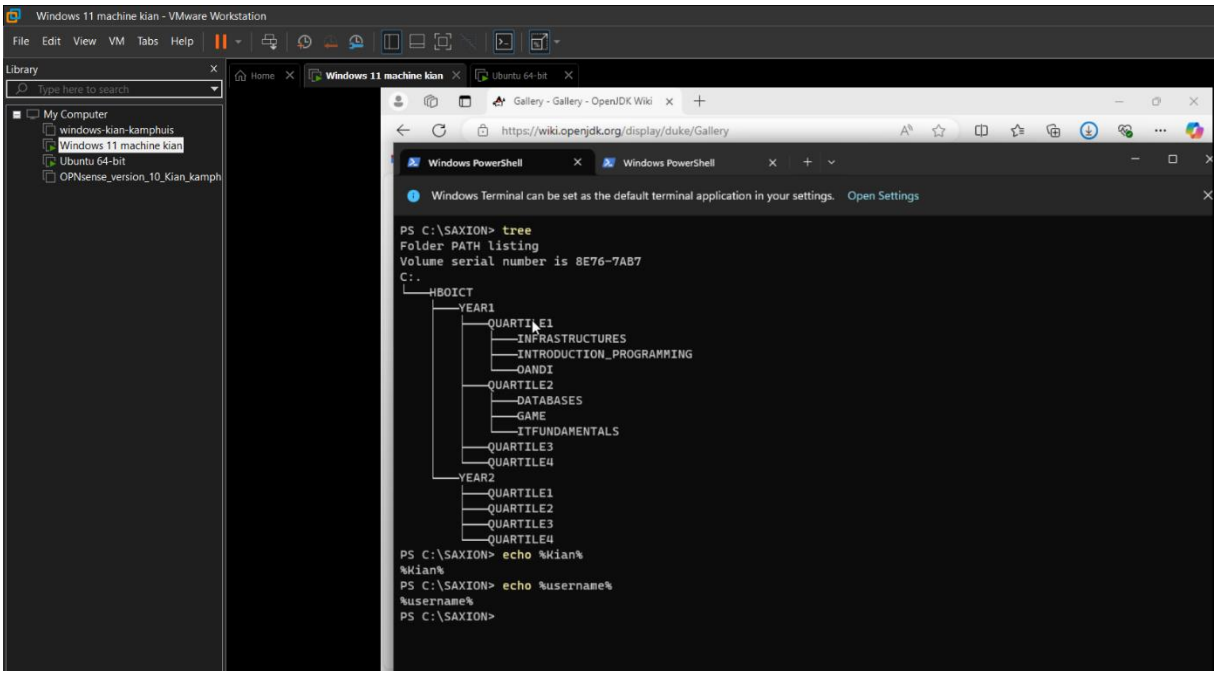
Working in the File Explorer

Relevant screenshots **copy** command:



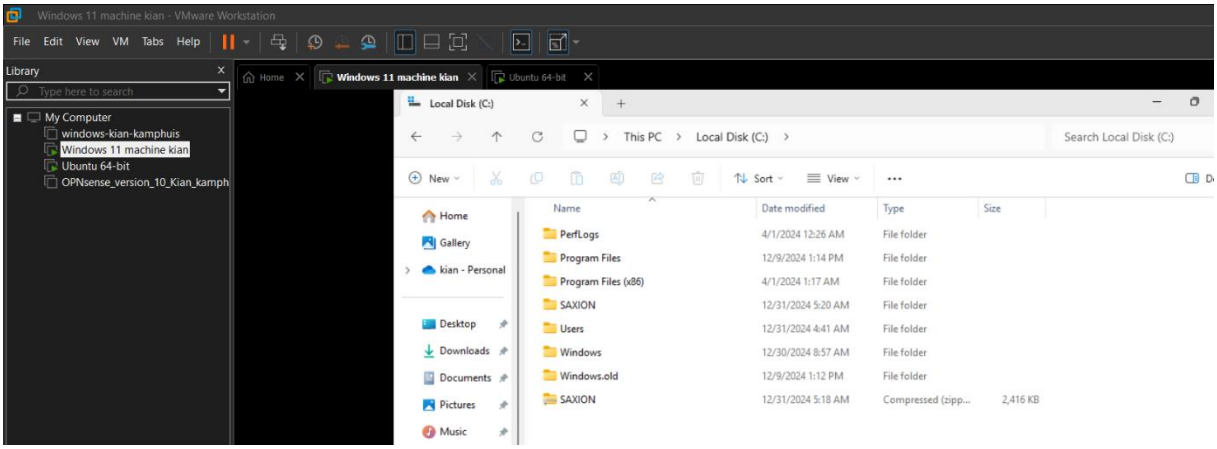


Relevant screenshots **tree** command:



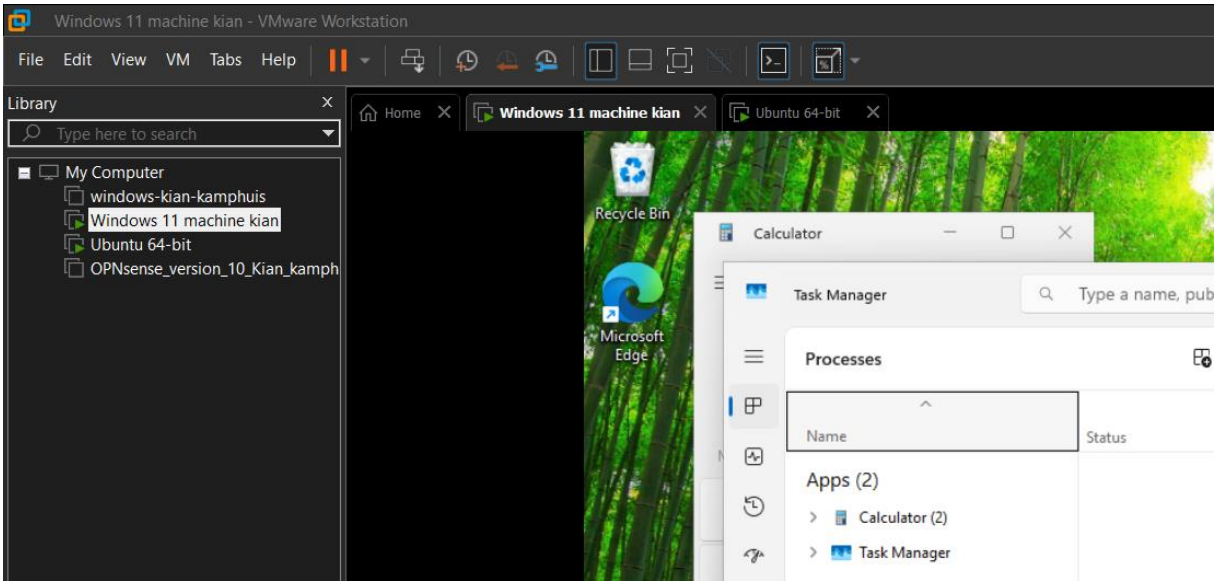
Relevant screenshots in the file explorer of the folder c:\Saxion + created zip file.

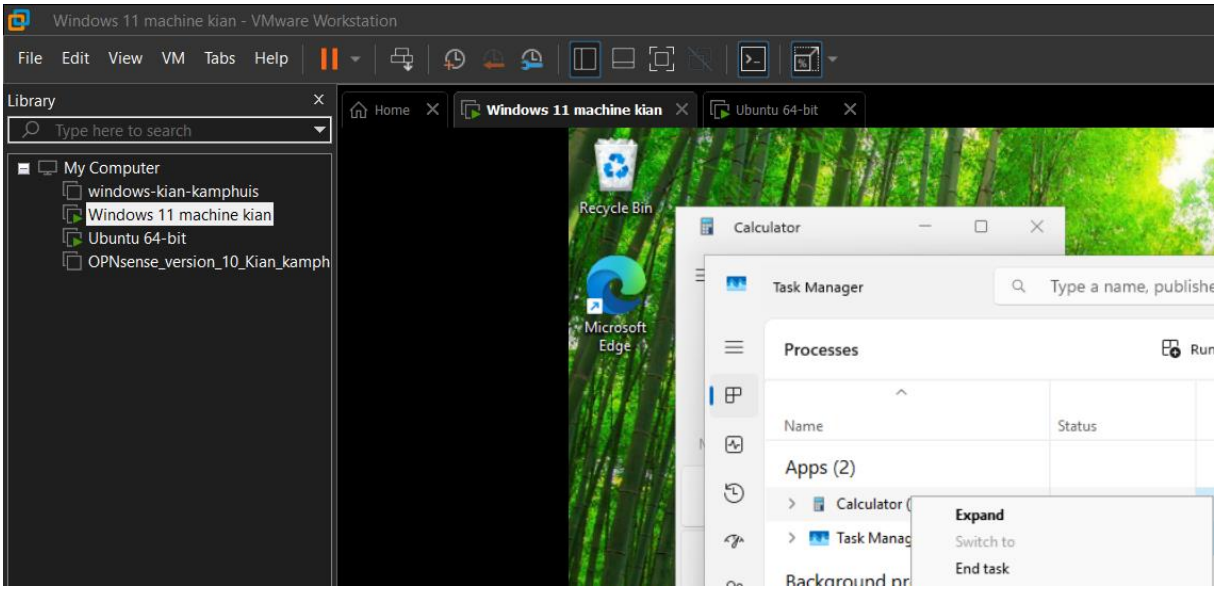
See the tree image above

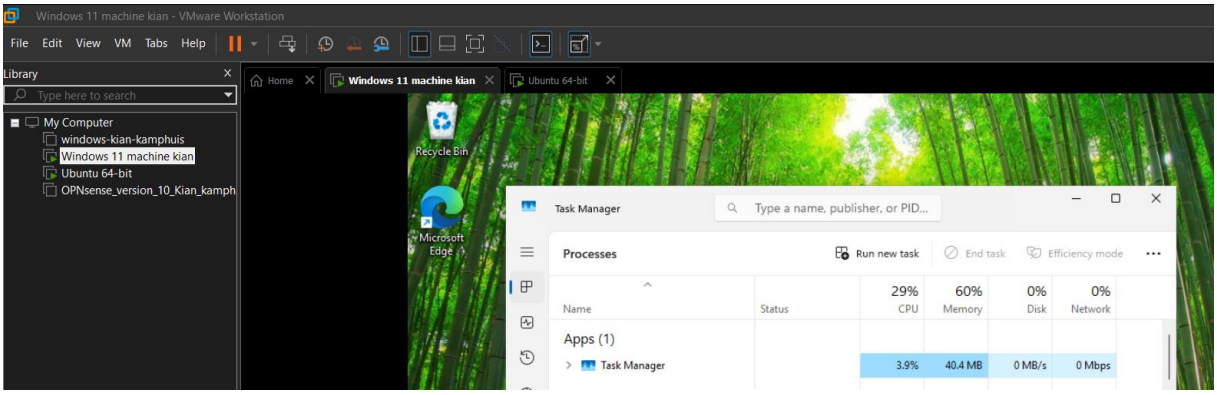


Terminating Processes

Relevant Screenshots Task Manager Window:



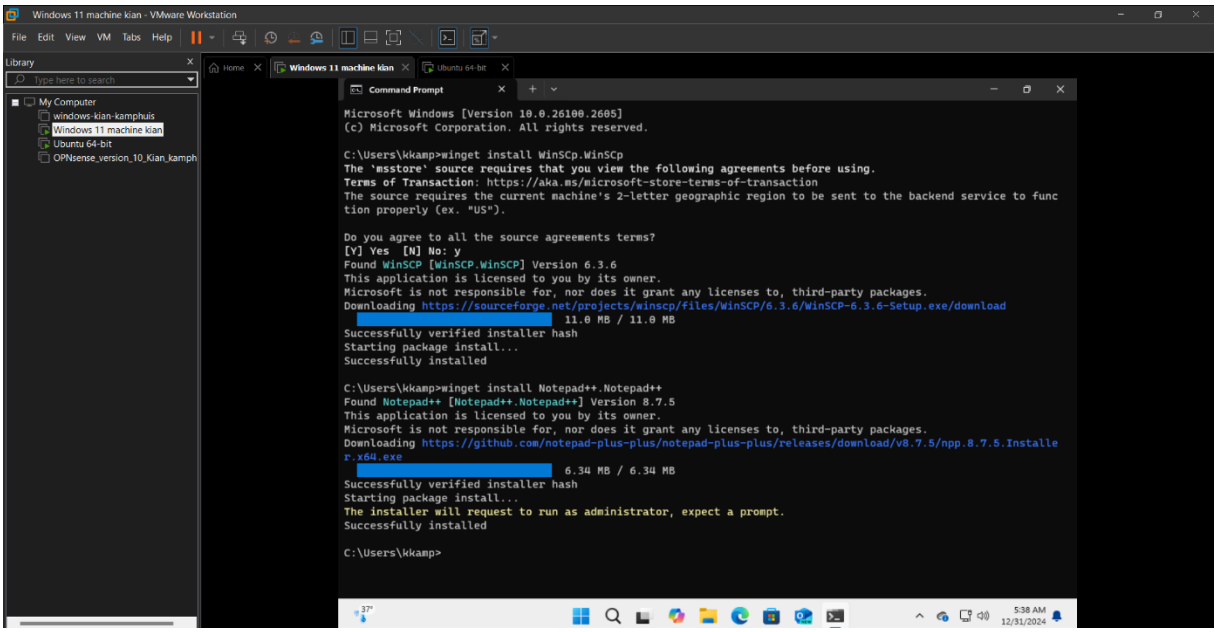


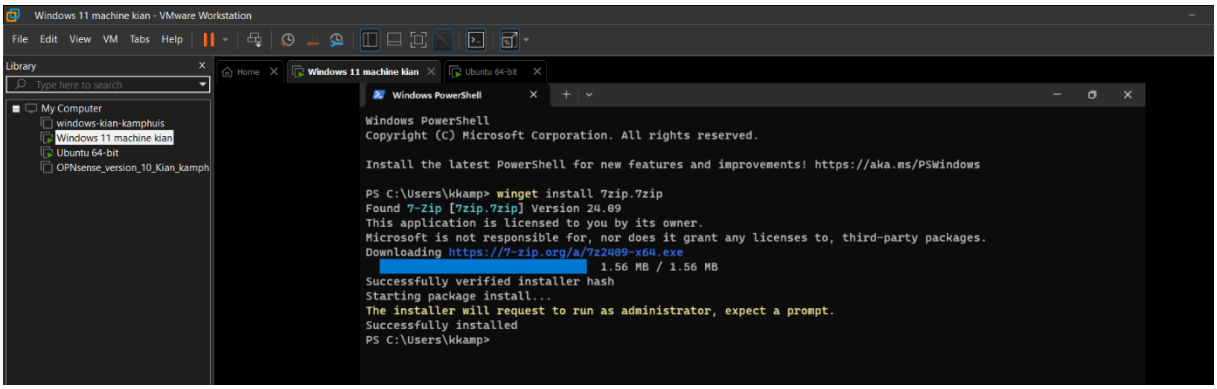


Install Software

Relevant screenshots that the following software is installed:

- WinSCP
- Notepad++
- 7zip

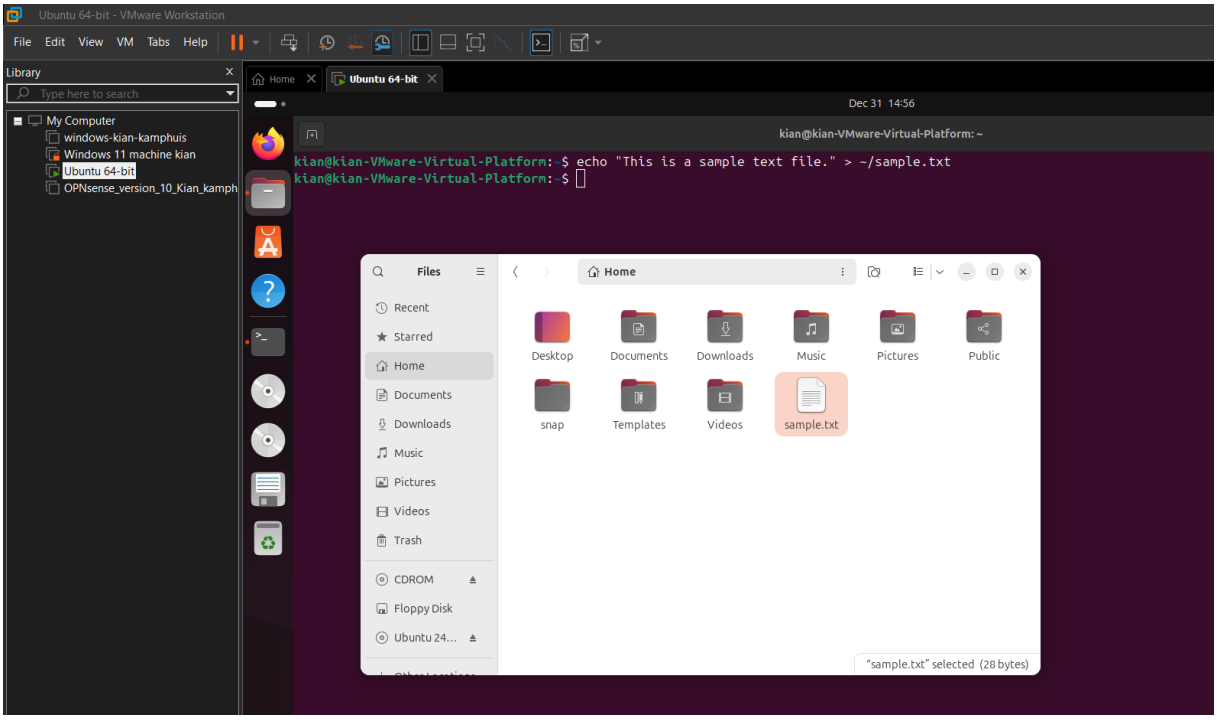




Assignment 5.4: Working with Linux

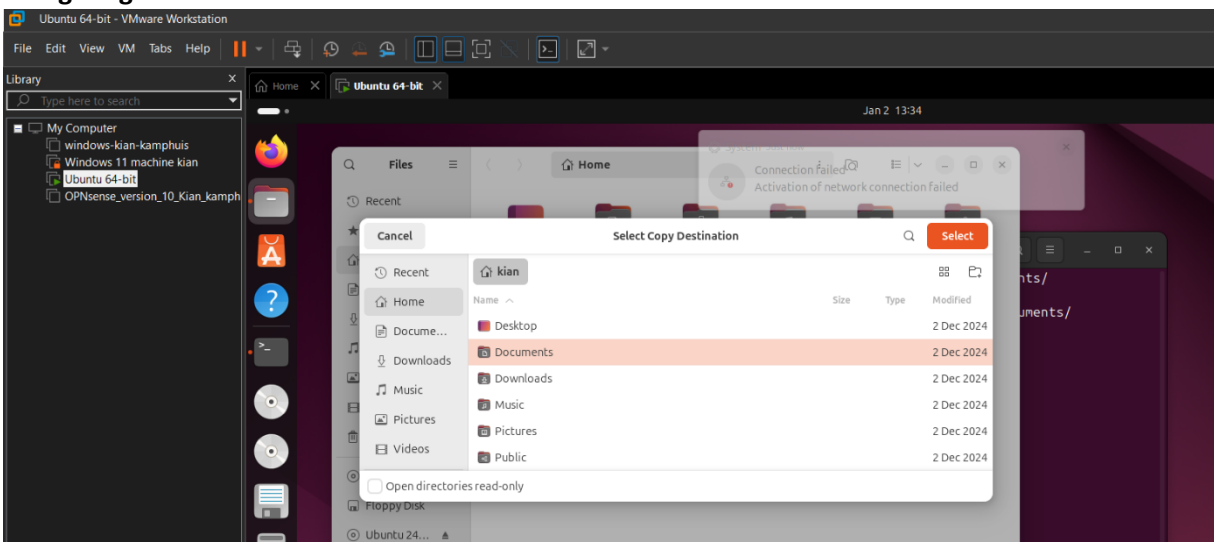
Relevant screenshots + motivation

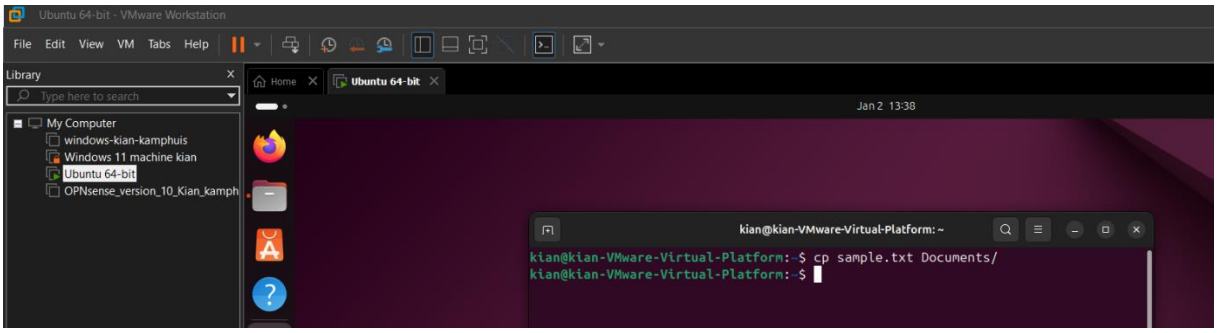
Copying files

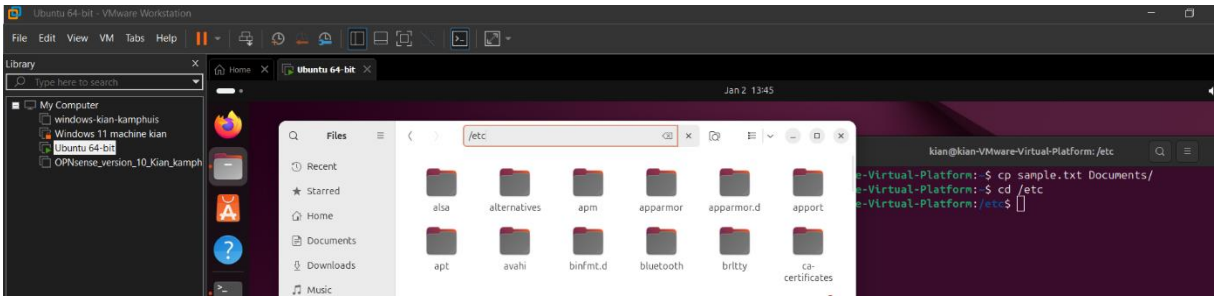


Created the txt file using the command above.

Navigating the file structure







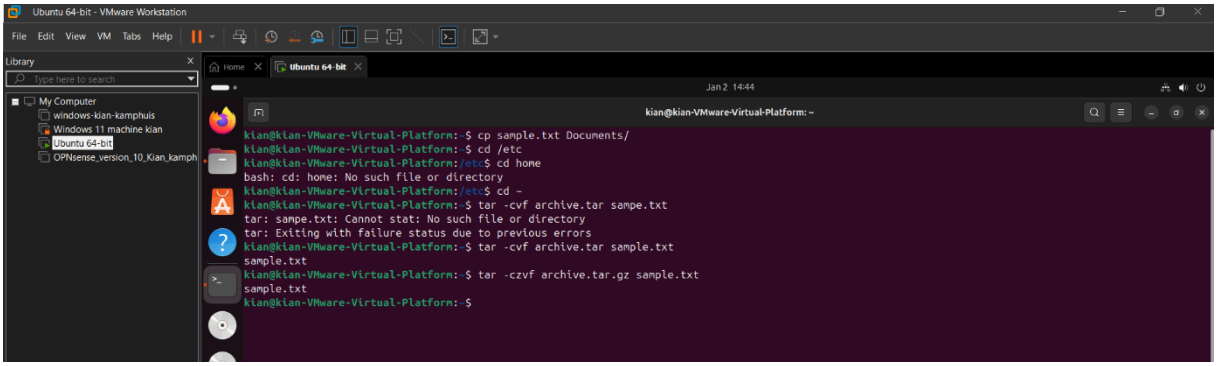
Linux uses a single hierarchical directory structure, starting from the root directory (/), whereas Windows uses multiple root directories (e.g., C:\, D:\)

The /etc directory contains configuration files for the system and applications.

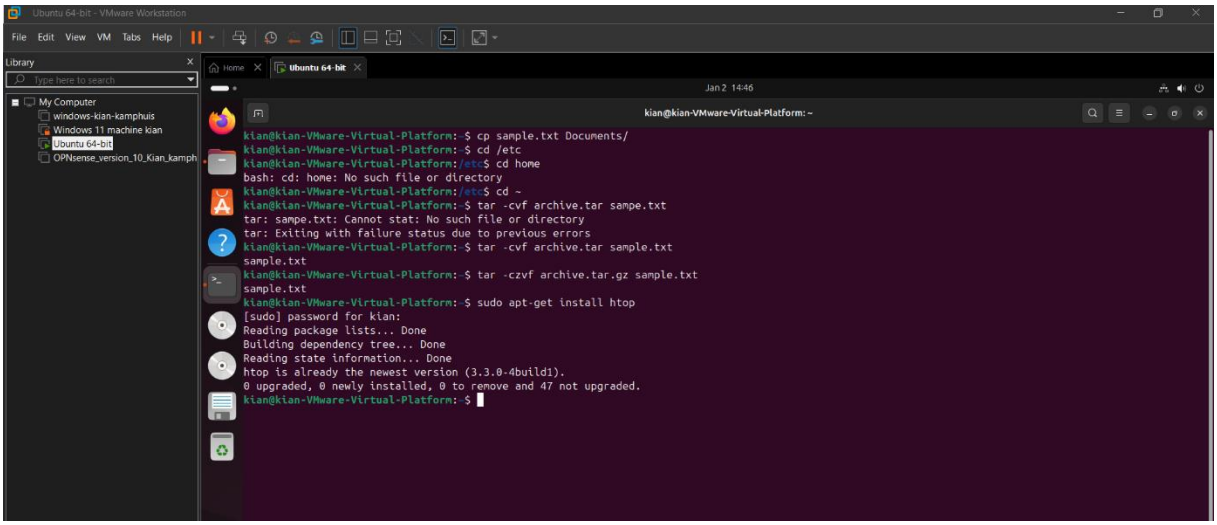
Compress files

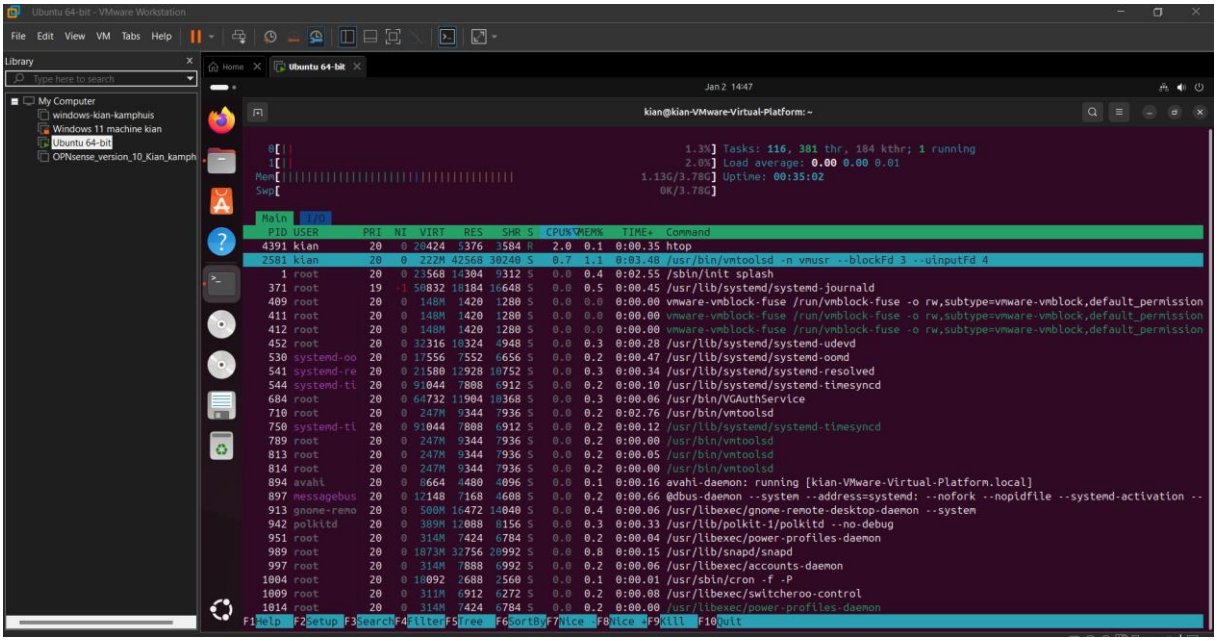
tar -cvf archive.tar sample.txt

tar -xvf archive.tar



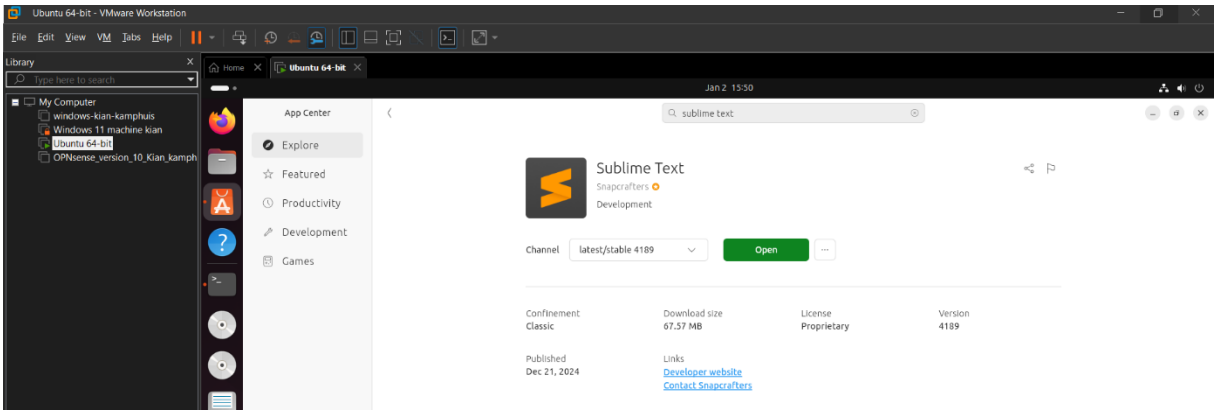
View processes

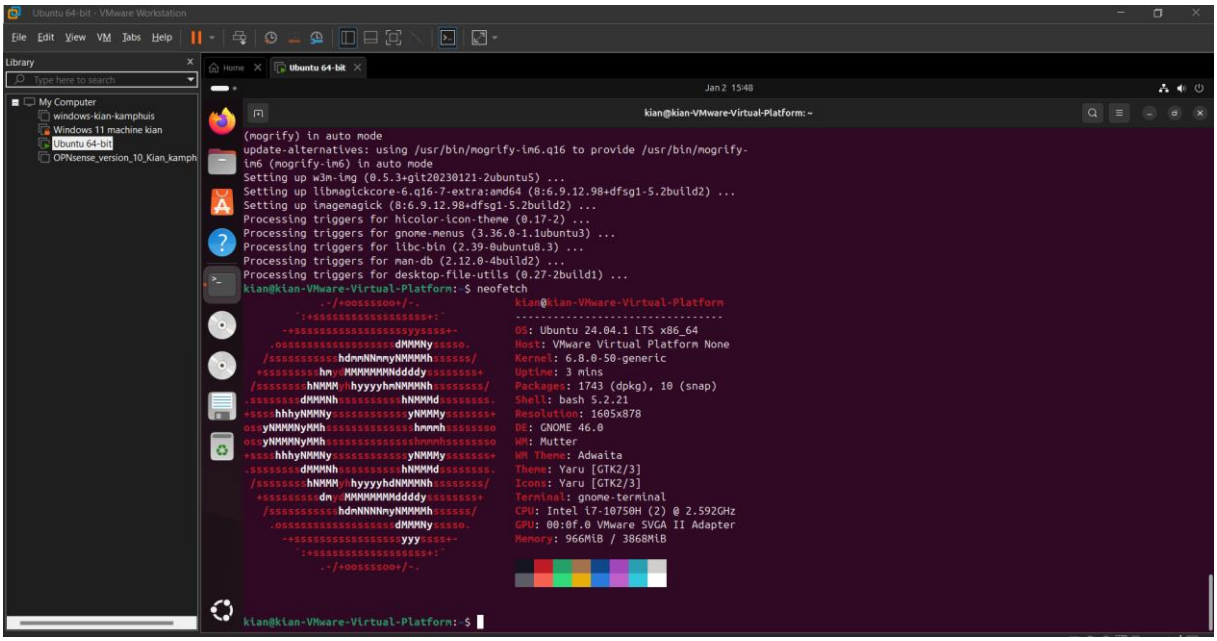




htop is an interactive process viewer for Unix systems. It shows a list of running processes, along with their CPU and memory usage, and allows you to manage processes (e.g., kill, renice) directly from the interface.

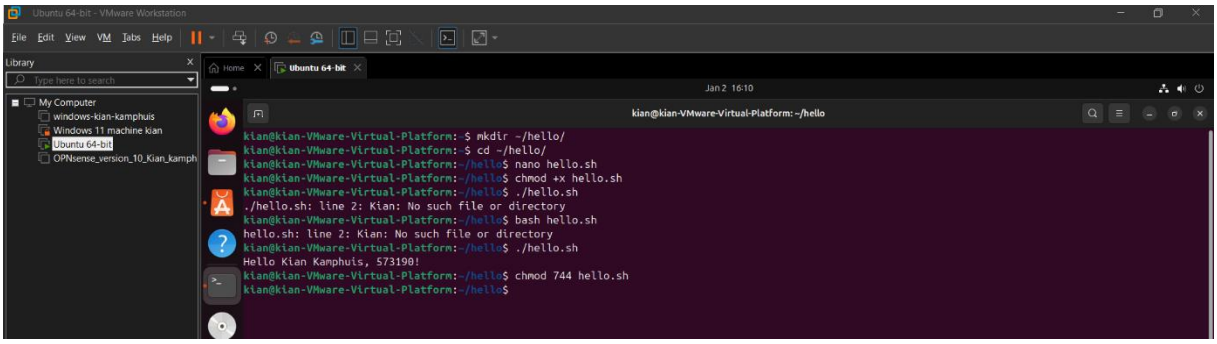
Install Software





Assignment 5.5: Users and permissions on Linux

Relevant screenshots + motivation



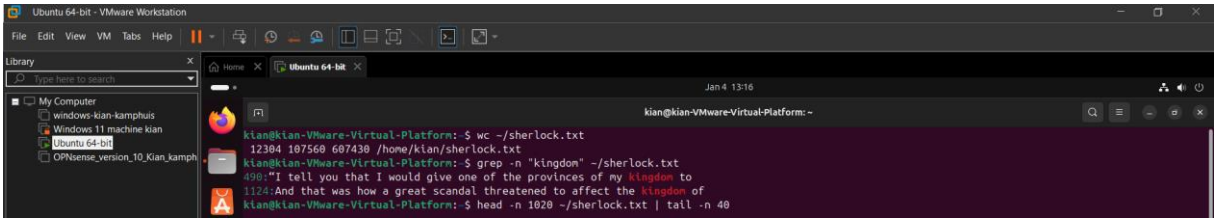
Assignment 5.6: View the contents of files

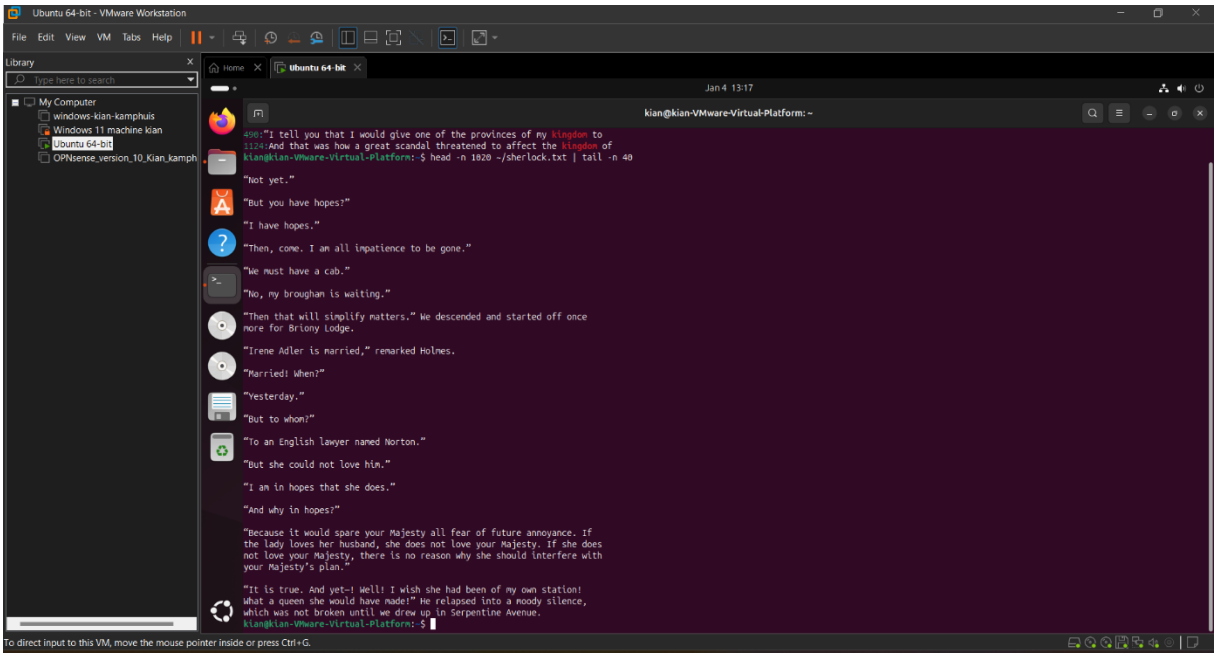
Relevant screenshots + motivation

1. Understanding the Commands

- **cat**: Concatenates and displays the content of files.
- **wc**: Word count; it can count lines, words, and characters in a file.
- **less**: Allows you to view the content of a file one screen at a time.
- **tail**: Displays the last part of a file.
- **head**: Displays the first part of a file.
- **grep**: Searches for patterns within files.

2. Commands



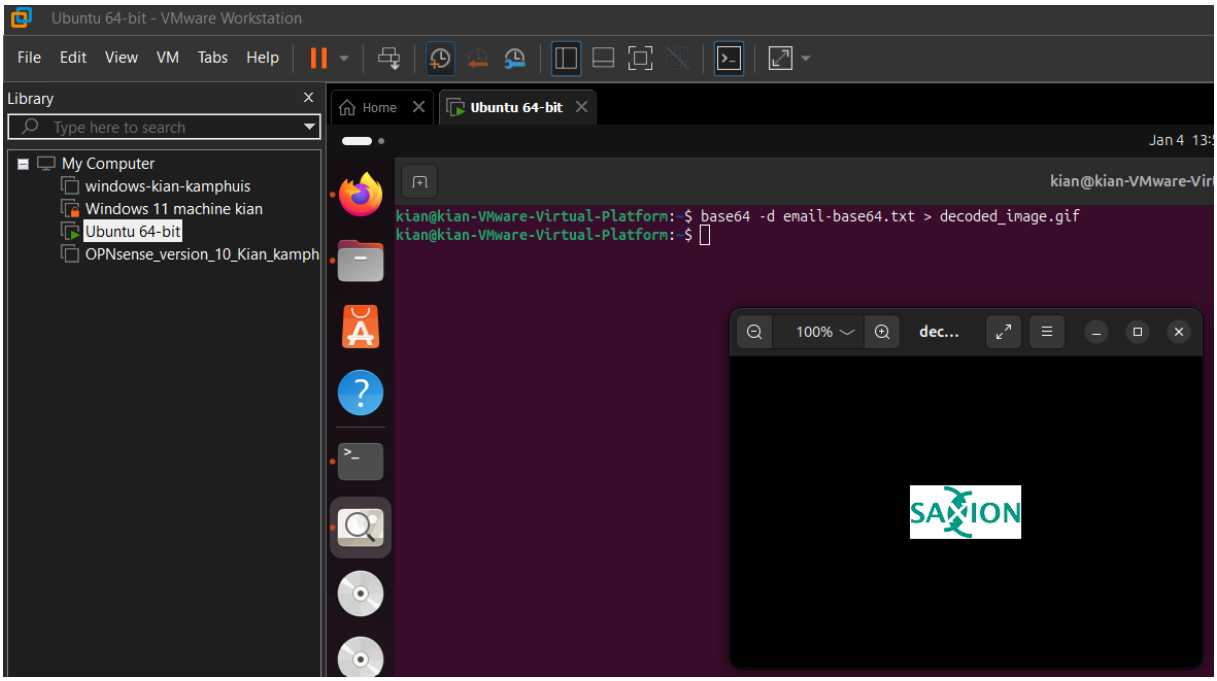


Assignment 5.7: Digital forensics

Relevant screenshots + motivation

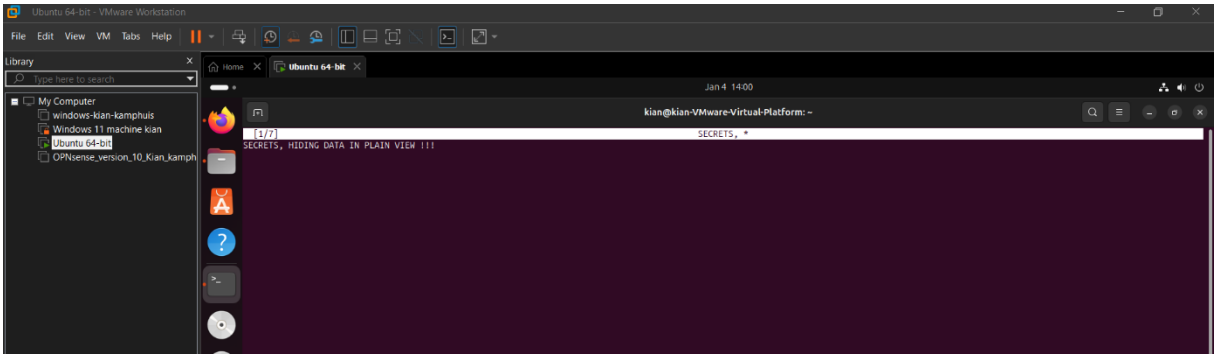
Latitude	53.11.39.6794
Longitude	6.32.12.9018
Model	moto g(6) play

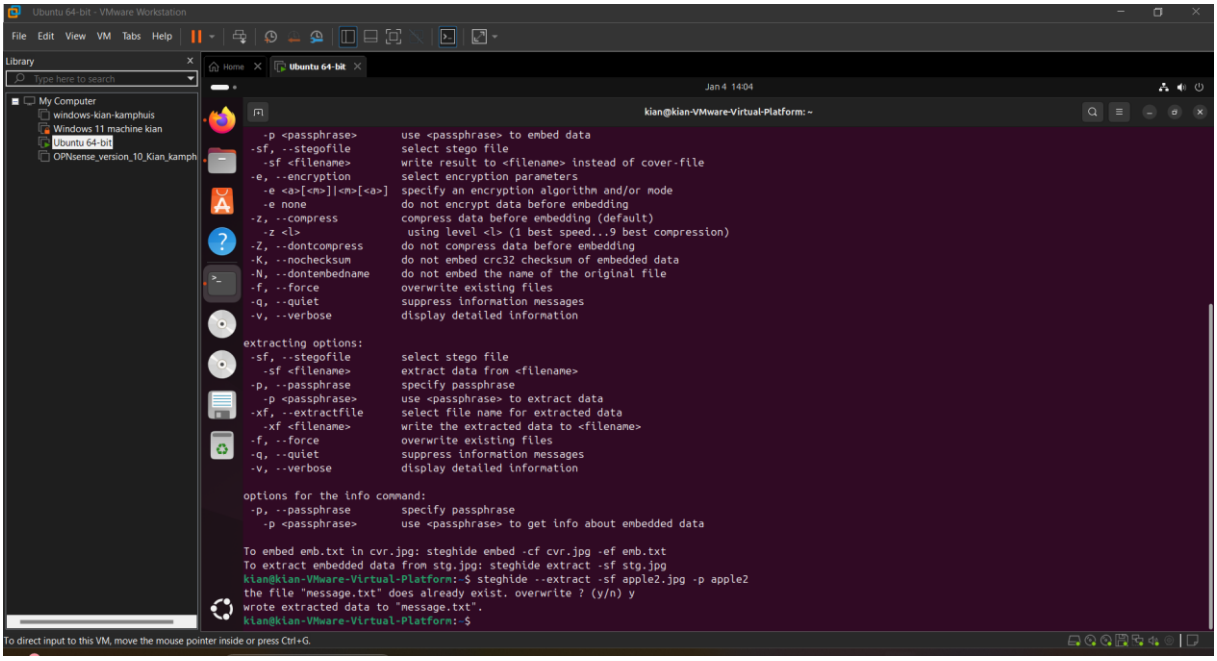
Ubuntu sees the file as a JPEG file.

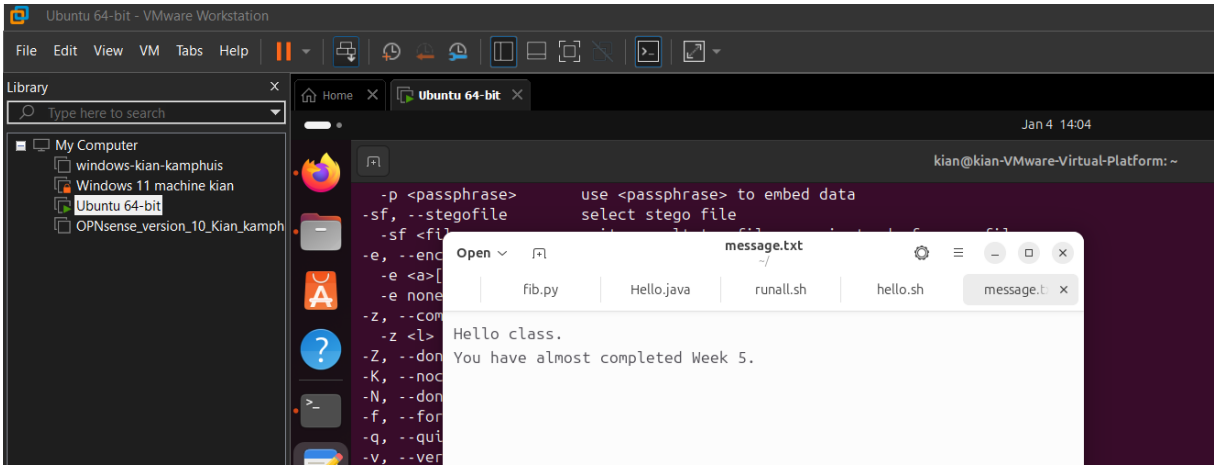


Assignment 5.8: Steganography

Relevant screenshots + motivation





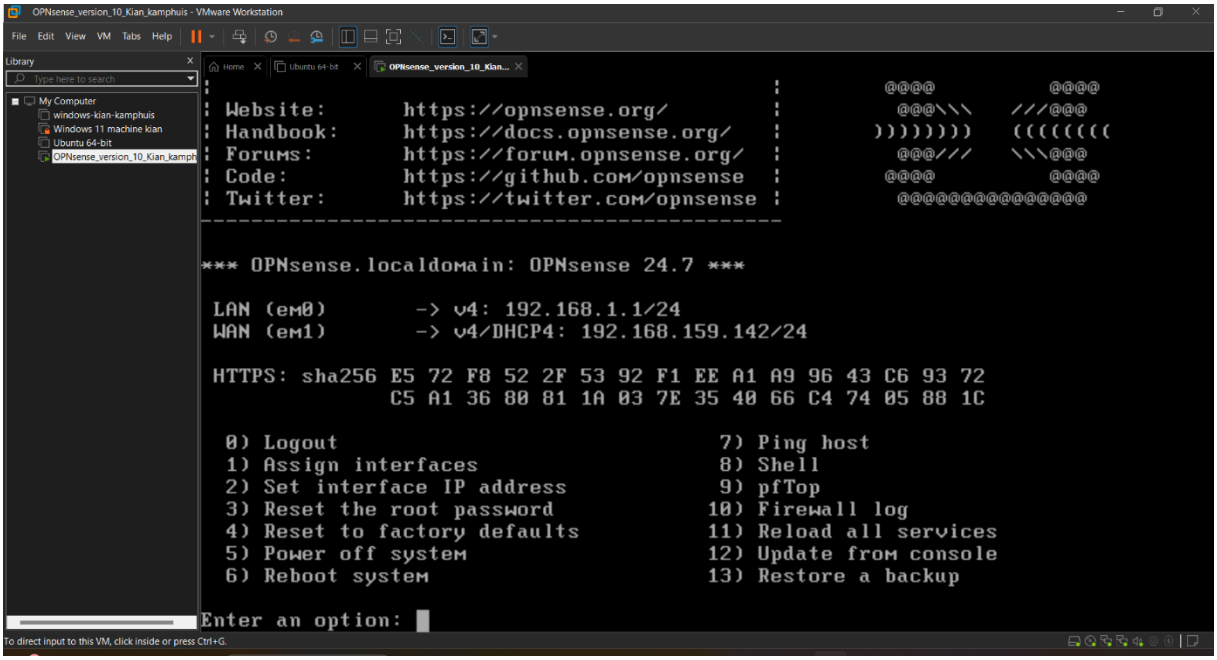


Bonus point assignment – week 5

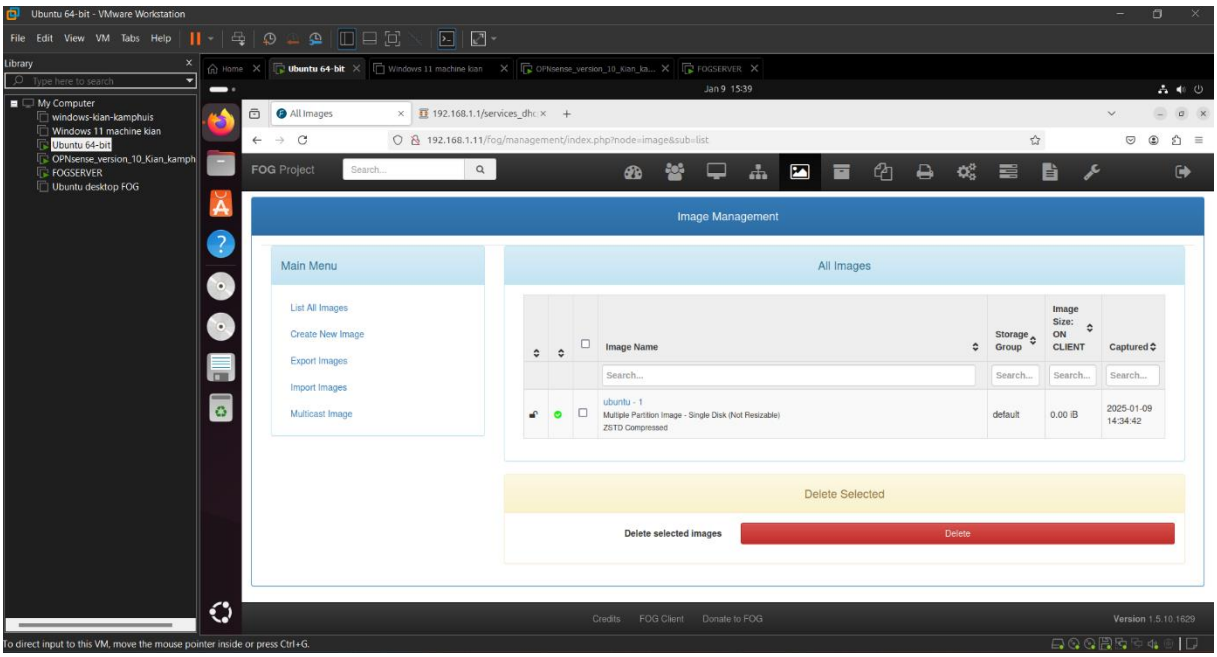
Make relevant screenshots + motivation:

- Proof that the FOG server is installed and is functioning correctly.
- Proof that the FOG server has made a back-up of the Windows11 VM or the Ubuntu 24.04 Desktop VM.

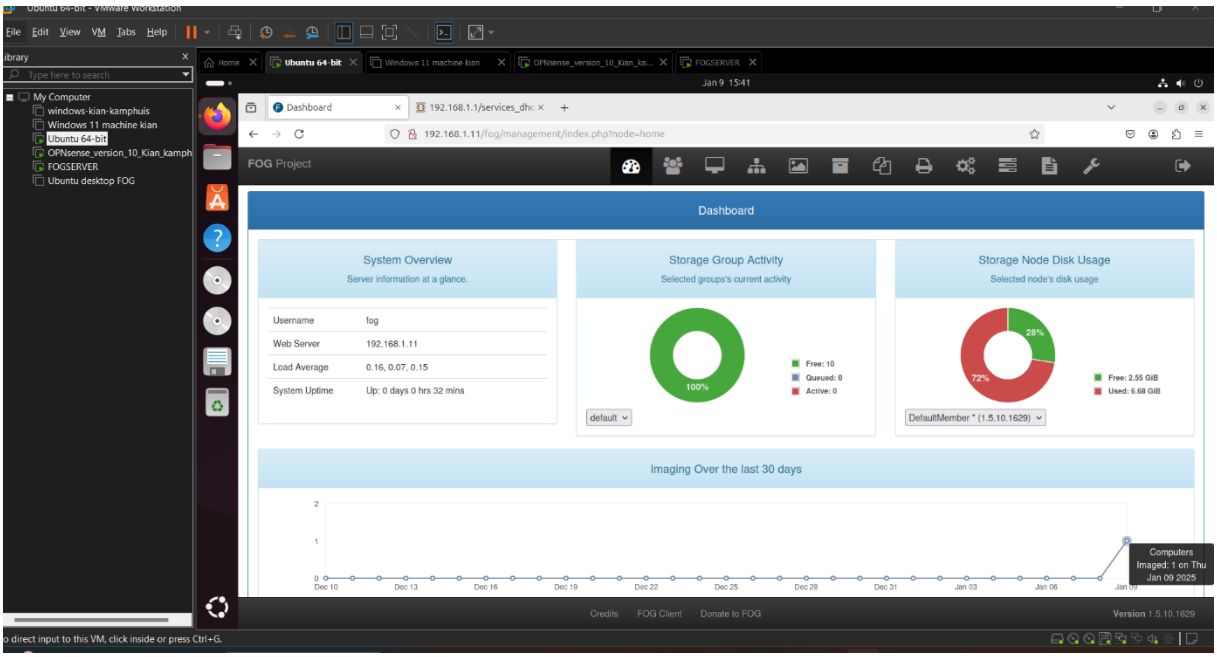
OPNsense server:



FOG Image management:



FOG Dashboard:



The image is so small because it only did the boot.

Ready? Save this file and export it as a pdf file with the name: **weessk5.pdf**