

Template Week 5 – Operating Systems

Student number:

Assignment 5.1: Unix-like

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

UNIX is a certification that some operating systems have such as Solaris, AIX, HP-UX, and macOS. It's a proprietary commercial thing. GNU/Linux and FreeBSD are UNIX-like operating systems because while they behave pretty much like UNIX, they both started out as x86 clone/work-a-likes.

- 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 and Dennis Ritchie: Foundational developers of UNIX and C, influencing operating systems and programming globally.

Bill Joy: Key figure in BSD UNIX and Sun Microsystems, advancing UNIX systems and tools.

Richard Stallman: Advocated for software freedom, creating the GNU Project and tools integral to Linux.

Linus Torvalds: Created the Linux kernel and Git, enabling the widespread adoption of UNIX-like systems.

- c) What is the philosophy of the GNU movement?

Advocate for software freedom.

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

Yes, because Ubuntu is just a distributor of GNU/Linux.

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

Microsoft Windows Subsystem for Linux (WSL)

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

Chrome OS.

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 highly specialized computing systems designed to perform complex and large-scale computations at extraordinary speeds. These systems are used in a wide variety of applications that require significant computational power.

- 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 distributed system computer composed primarily of PlayStation 3 video game consoles. Before and during the console's production lifetime, its powerful IBM Cell CPU attracted interest in using multiple, networked PS3s for affordable 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/>

The Oracle Raspberry Pi supercomputer was designed for educational and experimental purposes, emphasizing cost-efficiency, scalability, and accessibility rather than raw computational power. So it is unlikely to appear in top 500.

- 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:

The PlayStation 5 uses a custom AMD Zen 2 processor with 8 cores running at variable frequencies up to 3.5 GHz. The architecture is based on x86-64.

The Xbox Series X also uses a custom AMD Zen 2 processor with 8 cores running at variable frequencies, peaking at 3.8 GHz for single-threaded operations. Like the PS5, it is based on x86-64.

OS:




The PS5 runs a custom PlayStation operating system built by Sony for gaming and media functionality.

The Xbox Series X runs a custom version of Windows, integrated with the Xbox Dashboard.

The shared x86-64 architecture allows developers to create games more efficiently for both platforms, minimizing hardware-specific optimization efforts and supporting features like backward compatibility.

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?
- 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?
- 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?
- 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:

```
C:\SAXION>copy Wave.png C:\SAXION\HBOICT\YEAR1\QUARTILE1\Introduction_to_Programming
1 file(s) copied.

C:\SAXION>_

C:\SAXION>copy Plug.png C:\SAXION\HBOICT\YEAR1\QUARTILE1\Introduction_to_Infrastructures
1 file(s) copied.

C:\SAXION>_

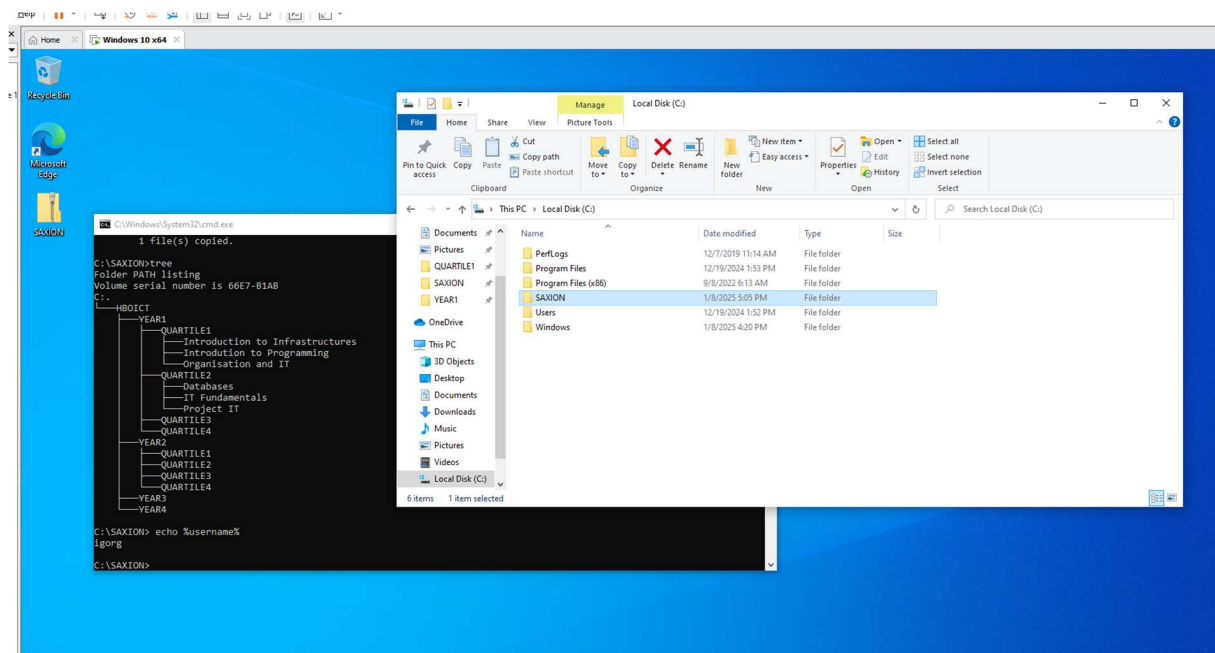
C:\SAXION>copy Tumble.png C:\SAXION\HBOICT\YEAR1\QUARTILE1\Organisation_and_IT
1 file(s) copied.

C:\SAXION>_
```

Relevant screenshots **tree** command:

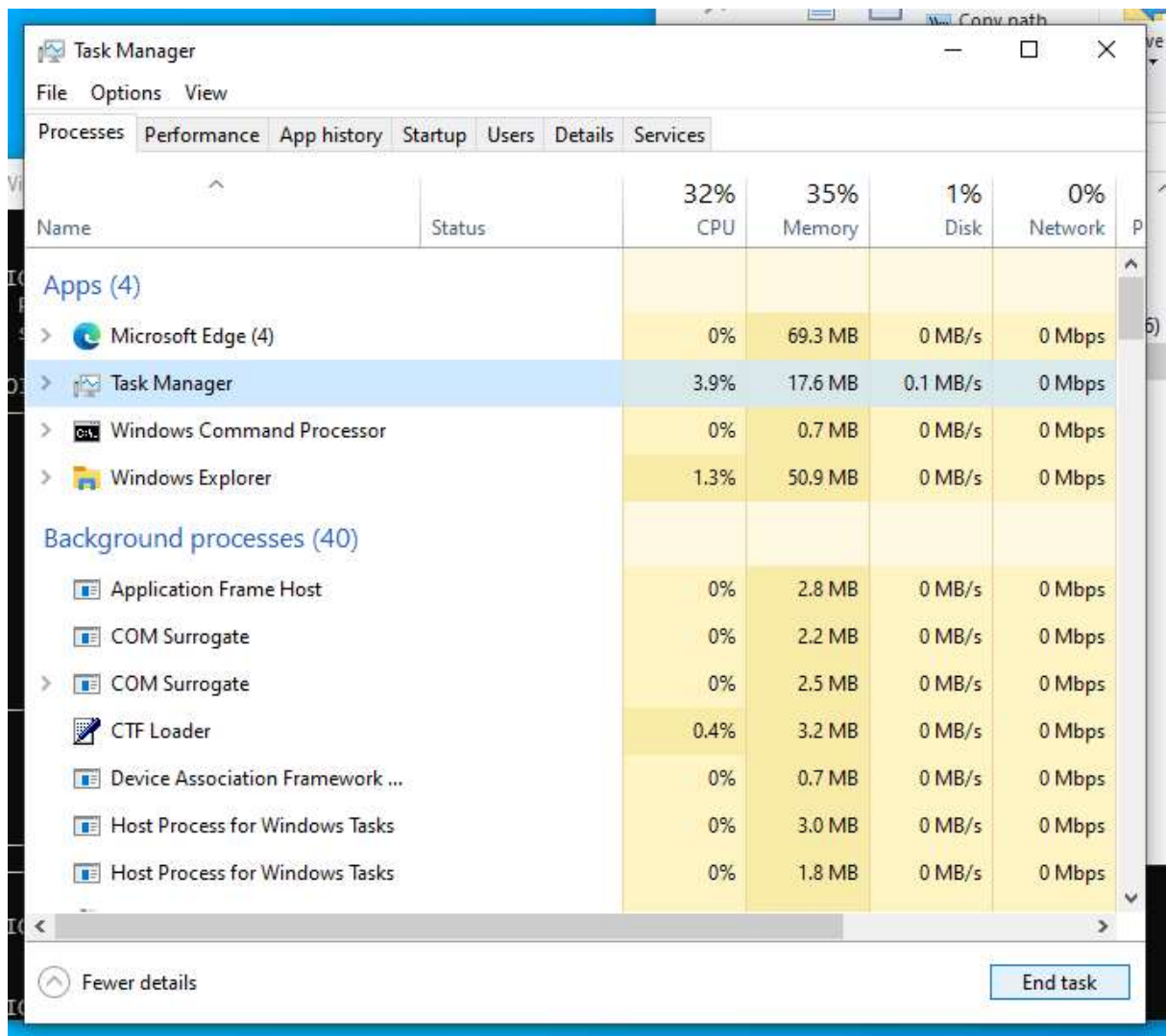
```
C:\SAXION>tree
Folder PATH listing
Volume serial number is 66E7-B1AB
C:.
├── HBOICT
│   ├── YEAR1
│   │   ├── QUARTILE1
│   │   │   ├── Introduction to Infrastructures
│   │   │   ├── Introduction to Programming
│   │   │   └── Organisation and IT
│   │   ├── QUARTILE2
│   │   │   ├── Databases
│   │   │   ├── IT Fundamentals
│   │   │   └── Project IT
│   │   ├── QUARTILE3
│   │   └── QUARTILE4
│   ├── YEAR2
│   │   ├── QUARTILE1
│   │   ├── QUARTILE2
│   │   ├── QUARTILE3
│   │   └── QUARTILE4
│   ├── YEAR3
│   └── YEAR4
C:\SAXION>
```

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



Terminating Processes

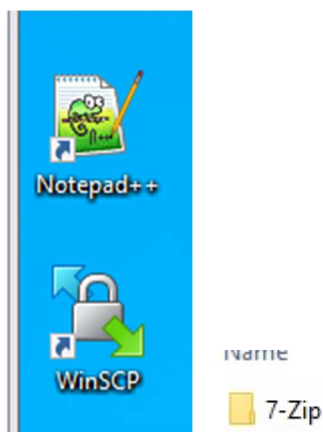
Relevant Screenshots Task Manager Window:



Install Software

Relevant screenshots that the following software is installed:

- WinSCP
- Notepad++
- 7zip



Assignment 5.4: Working with Linux

Relevant screenshots + motivation

Assignment 5.5: Users and permissions on Linux

Relevant screenshots + motivation

Assignment 5.6: View the contents of files

Relevant screenshots + motivation

Assignment 5.7: Digital forensics

Relevant screenshots + motivation

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.

* Setup complete

You can now login to the FOG Management Portal using the information listed below. The login information is only if this is the first install.

This can be done by opening a web browser and going to:

<http://192.168.43.138/fog/management>

Default User Information

Username: fog

Password: password

* Changed configurations:

The FOG installer changed configuration files and created the following backup files from your original files:

* /etc/vsftpd.conf <=> /etc/vsftpd.conf.1736415266

* /etc/exports <=> /etc/exports.1736415266

root@server2:~/fogproject/bin# _

Partclone

Partclone v0.3.32 <http://partclone.org>

Starting to clone device (/dev/sda) to image (/tmp/pigz1)

Reading Super Block

Calculating bitmap... Please wait...
done!

File system: raw

Device size: 21.5 GB = 41943040 Blocks

Space in use: 21.5 GB = 41943040 Blocks

Free Space: 0 Byte = 0 Blocks

Block size: 512 Byte

Elapsed: 00:00:15 Remaining: 00:05:43 Rate: 3.59GB/min

Current Block: 1755136 Total Block: 41943040

Data Block Process:

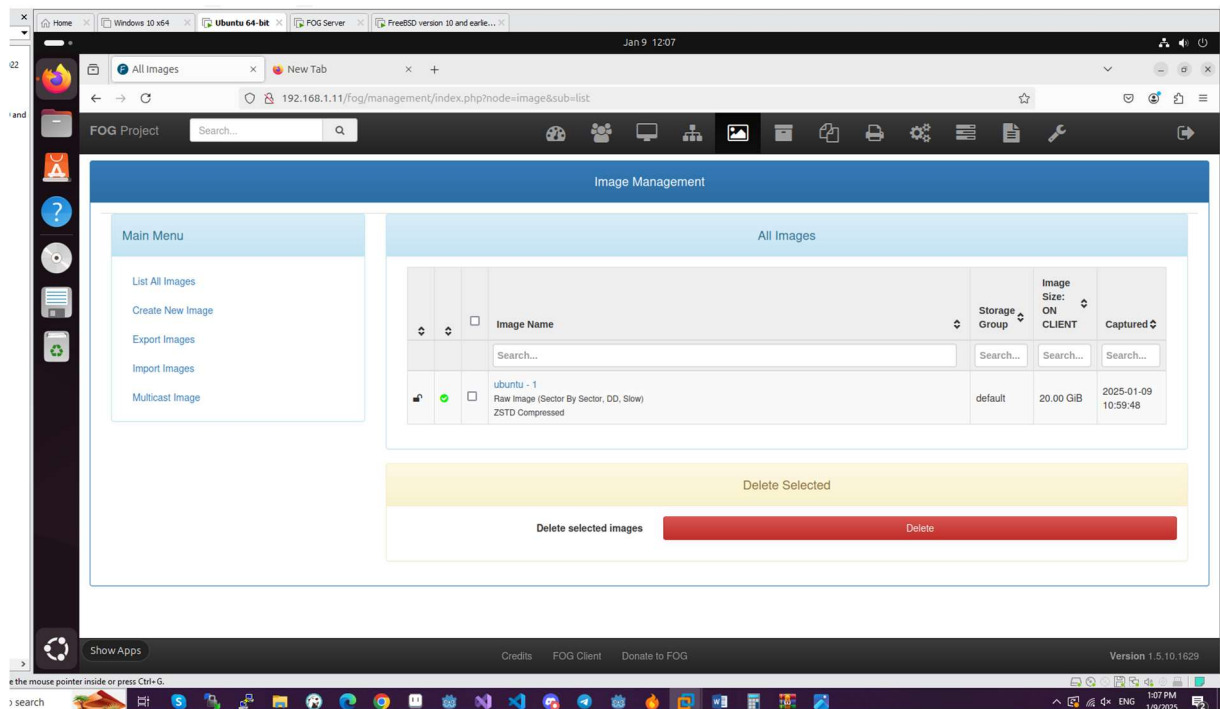


4.18%

Total Block Process:



4.18%



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