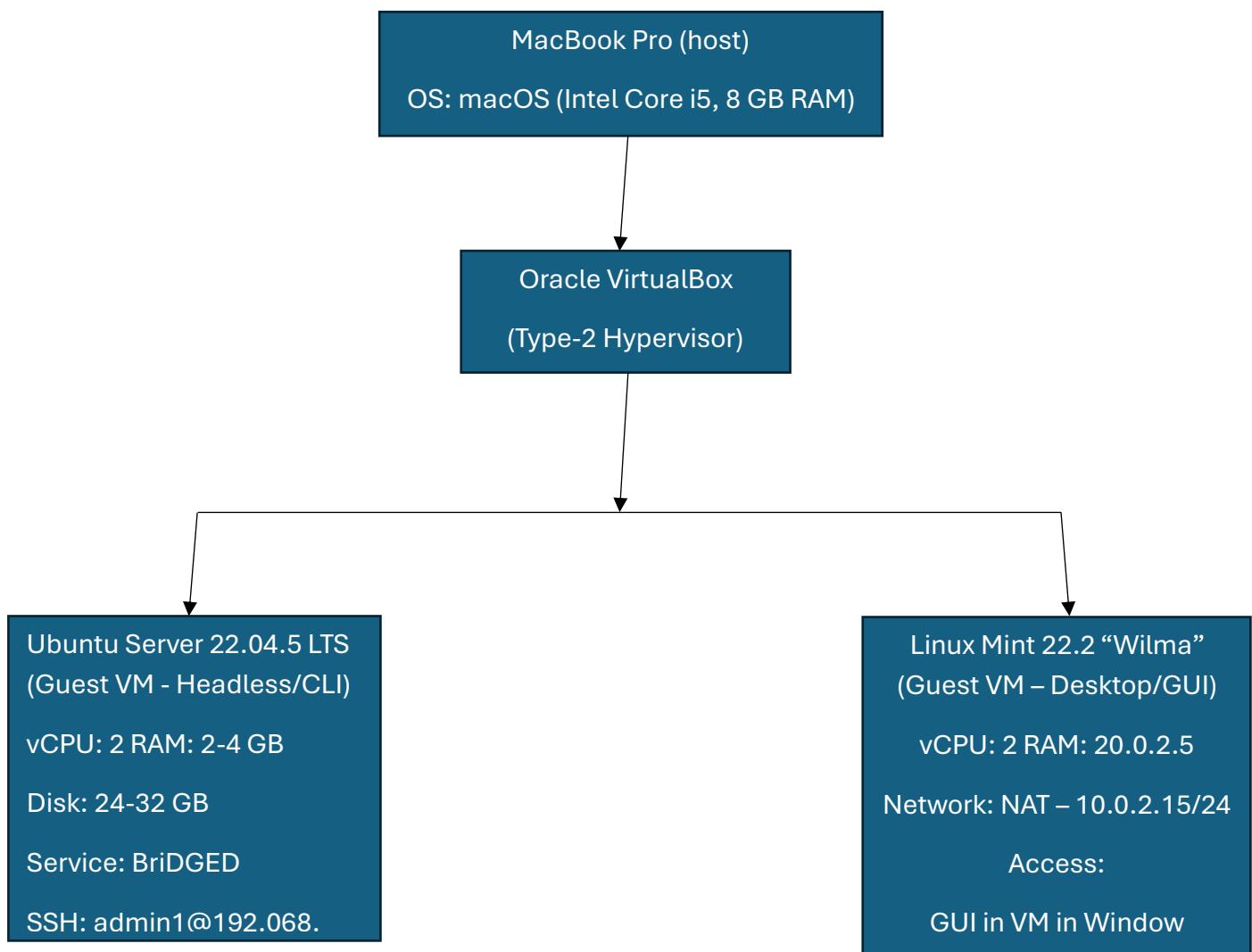


Week 1 - System Planning and Distribution Selection

Module: Operating Systems (CMPS202)
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1. System Architecture Diagram



2. Distribution Selection Justification

My setup comprises a MacBook Pro (Intel Core i5) running macOS as the host operating system. Using Oracle VirtualBox, I created two virtual machines: Ubuntu Server 22.04.5 LTS and Linux Mint 22.2 (“Wilma”). I chose to work with two distributions — Ubuntu Server 22.04.5 LTS and Linux Mint 22.2 (“Wilma”) — because they are both Debian-based, share the same package manager (apt). Yet, each offers unique strengths that make them valuable for comparison.

Ubuntu Server 22.04.5 LTS

- Ubuntu Server is stable, secure, and lightweight, designed for command-line use.
- It is widely adopted in enterprise environments and ideal for learning terminal-based system management.
- The installation process is quick and straightforward, with guided setup options that help beginners learn basic server configurations.
- It supports SSH for remote connections, making it suitable for testing real-world server scenarios.

Linux Mint 22.2 (“Wilma”)

- Linux Mint is built on Ubuntu but tailored for desktop usability with a smooth graphical user interface (GUI).
- The installation procedure is simple and user-friendly — perfect for newcomers to Linux.
- It offers software management through both the terminal and the built-in Software Manager.
- I personally found Mint easier and more comfortable to use due to its familiar desktop layout and straightforward navigation.

3. Comparison with Alternatives

- Fedora: Modern but updates too frequently, which can cause instability during coursework.
- Debian: Extremely stable but demands more manual configuration; slower release updates.
- CentOS Stream: More advanced, requiring greater Linux knowledge, not suitable for beginners.

4. Network Configuration

- **Ubuntu Server (Bridged Adapter):**

The Ubuntu VM is configured with the Bridged Adapter setting. This configuration allows it to appear as a separate device on the local network and acquire its own LAN IP address (e.g., 192.168.x.x). This enables SSH connections from the Mac host.

- **Linux Mint (NAT):**

The Linux Mint VM uses NAT (Network Address Translation) mode, which automatically shares the host's internet connection. The VM receives an internal IP address (e.g., 10.0.2.15) for software updates and web access.

5. System Specifications and Command Outputs

Linux Mint 22.2 (Main Work Environment)

`uname -a`

This command provides details about the system's kernel (such as the Linux version, architecture, and machine name).

`free -h`

This command reports the system's memory, including total RAM, current usage, and remaining free memory.

`lsb_release -a`

The `lsb_release` command shows the Linux distribution name, version number, and codename (for example, Linux Mint 22.2 Zara).

df -h

This command shows disk space usage and availability on the virtual machine.

ip addr

This command lists all network interfaces on the VM and their respective IP addresses.

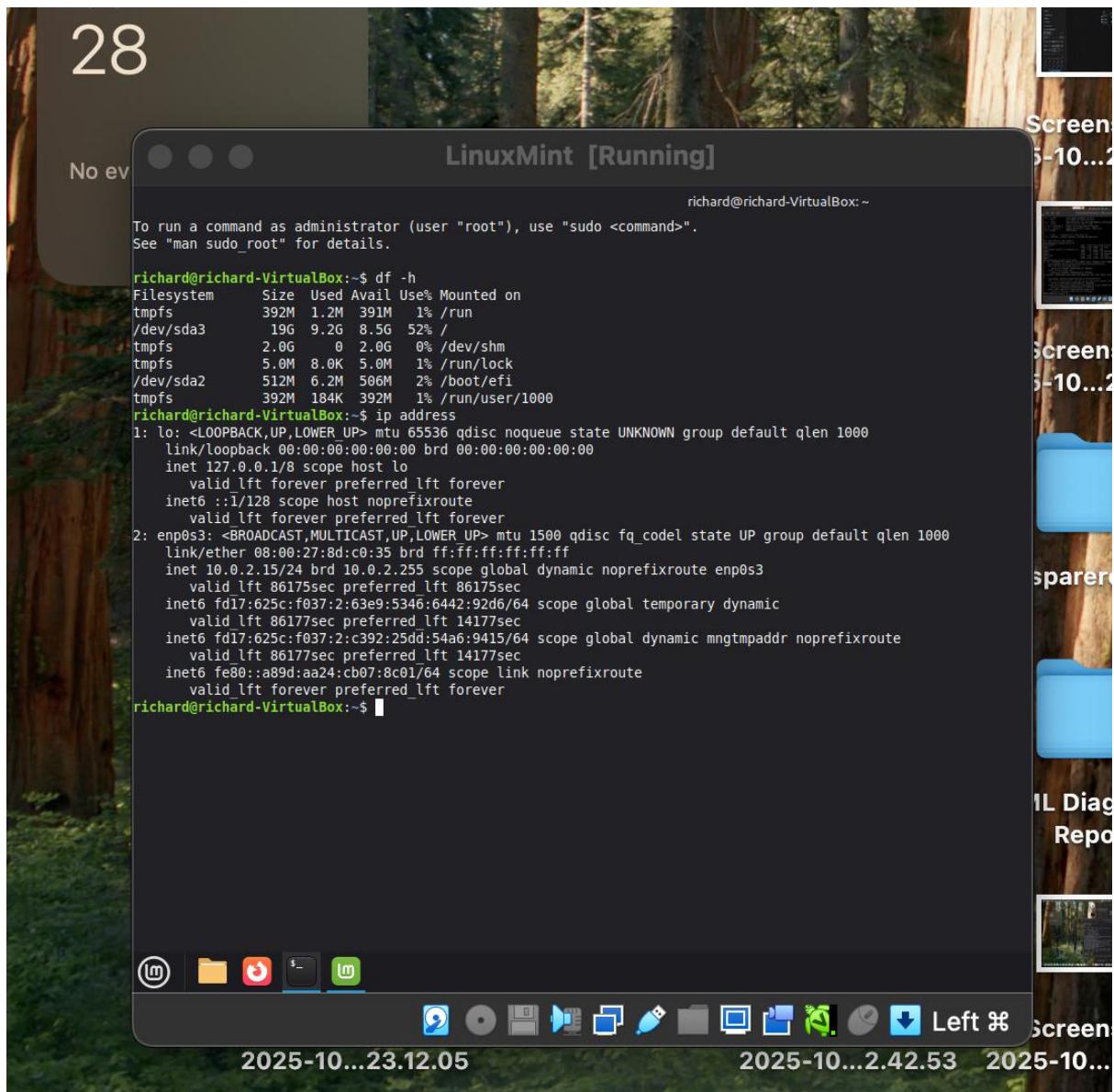
Reflection

From this week's work, I have learnt how to:

- Install and configure two different Linux distributions (Mint & Ubuntu).
- Use VirtualBox to create and network virtual machines.
- Execute key Linux commands to retrieve system information.
- Understand the differences between GUI-based (Mint) and CLI-based (Ubuntu) operating systems.

Overall, I found Linux Mint easier and faster to install and use for everyday tasks, while Ubuntu Server helped me develop confidence with the Linux terminal and commands. Lastly, I found Linux Mint more accessible and practical for my coursework because of its GUI, while Ubuntu Server enhanced my understanding of CLI-based system management. Both complement each other well for learning about different Linux environments.

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