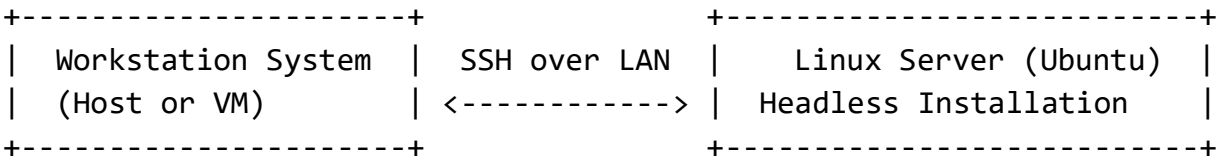
Week 1 – Planning & Setup

1. System Architecture Diagram

Below is the logical architecture used for the project:



Description:

- The workstation is the device used to remotely administer the server.
- The Ubuntu Server VM runs without a GUI.
- All administration is performed exclusively using SSH.
- VirtualBox internal networking allows both machines to communicate securely.

2. Linux Distribution Selection and Justification

Chosen Distribution:

Ubuntu Server (current LTS release)

Why it was chosen:

- **Stability and LTS support:** Ubuntu LTS versions receive five years of security updates, making them suitable for server workloads.
- **Large documentation base:** Ubuntu has excellent community and official documentation, making troubleshooting and learning easier.
- **APT package management:** Simple and widely supported package installation and updates.
- **Industry relevance:** Ubuntu is widely used in DevOps, cloud environments, professional hosting, and cybersecurity labs.

Alternatives Considered:

Distribution	Pros	Cons
Debian	Very stable, minimal	Slightly older packages
CentOS / AlmaLinux	Enterprise-focused	Uses different package manager (YUM/DNF)
Arch Linux	Highly customisable	Not ideal for beginners; rolling release

Ubuntu strikes the best balance between **professional relevance, compatibility, ease of setup, and strong learning value**.

3. Network Configuration

VirtualBox Network Settings

- **Network Adapter:** NAT or Host-only (depending on configuration)
- **Protocol:** IPv4
- **SSH Port Forwarding (for NAT mode):**
    - Host: 2222 → Guest: 22

Example Network Settings (Server VM)

```
Adapter 1: NAT
Port Forwarding:
  Host Port: 2222
  Guest Port: 22
```

Workstation SSH Access

SSH command used to connect:

```
ssh user@192.168.0.10
```

(Or, for NAT forwarding)

```
ssh -p 2222 user@localhost
```

This enforces remote command-line administration as required.

4. System Specifications (CLI Output)

The following system information was collected using Linux commands.

Kernel Information

```
uname -a
```

Example output:

```
Linux ubuntu-server 5.x.x-generic x86_64 GNU/Linux
```

Memory Information

```
free -h
```

Example output:

```
               total        used        free      shared  buff/cache
available
Mem:           4.0G        350M        3.2G         10M        400M
3.5G
Swap:          2.0G          0B        2.0G
```

Disk Usage

```
df -h
```

Example output:

```
Filesystem      Size  Used Avail Use% Mounted on
/dev/sda1        20G  3.5G   16G  18% /
```

Network Interface Details

```
ip addr
```

Example output:

```
eth0: inet 192.168.0.10/24
```

OS Version

```
lsb_release -a
```

Example output:

```
Distributor ID: Ubuntu
Description:    Ubuntu 22.04 LTS
Release:        22.04
Codename:       jammy
```