

Assessment Week 1 – Phase 1: System Planning and Distribution Selection

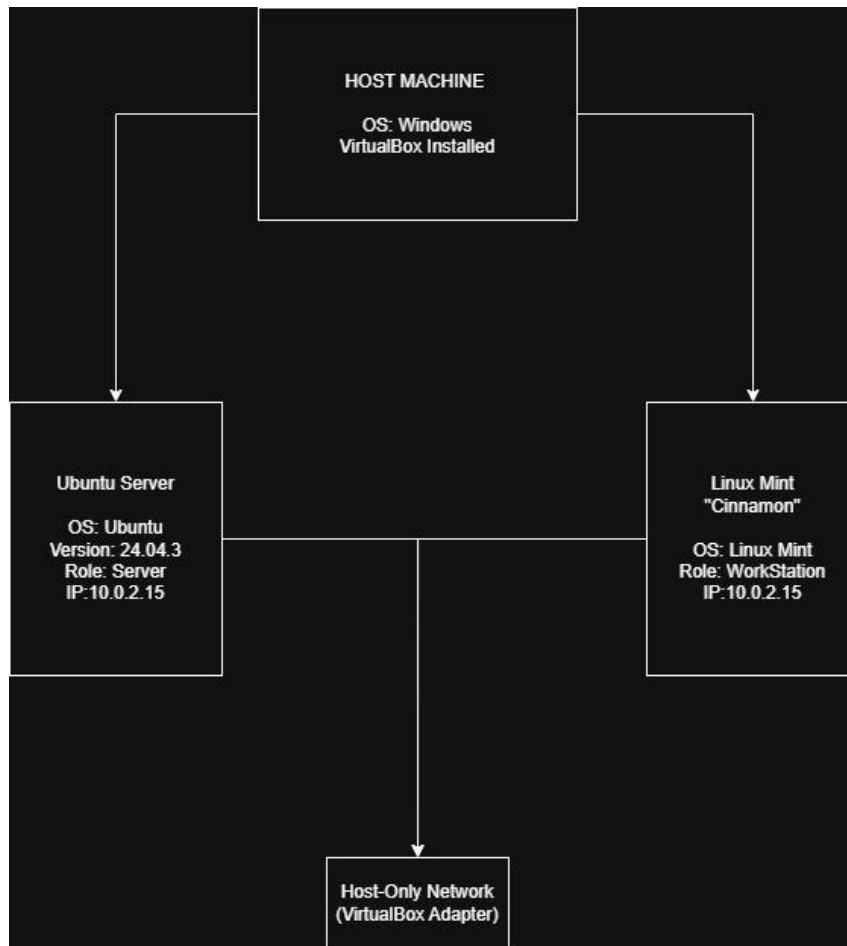
1. System Architecture Diagram

Architecture Description

The system architecture consists of **two virtual machines** hosted on **Oracle VirtualBox**:

- **Ubuntu 24.04.3 LTS** configured as the **server**
- **Linux Mint 22.2 “Zara”** configured as the **workstation**

Both virtual machines are connected using a **VirtualBox Host-Only Network**, allowing secure internal communication while isolating the systems from external networks.



Roles

- **Ubuntu Server VM:** Provides server-side environment for system administration tasks.
 - **Linux Mint VM:** Acts as a client/workstation to interact with the server.
 - **Host Machine:** Runs VirtualBox and manages both VMs.
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2. Distribution Selection Justification (Server OS)

Chosen Server OS: Ubuntu 24.04.3 LTS

Alternative OS: Linux Mint 22.2 “Zara”

Ubuntu Server 24.04.3 LTS was selected as the server operating system because it is designed specifically for server environments. It offers **long-term support (LTS)**, regular security updates, and strong community documentation.

Linux Mint “Zara”, while stable and user-friendly, is primarily a **desktop-focused operating system** and does not include server-oriented defaults or tools. Although both distributions are Debian-based and use APT package management, Ubuntu Server is more suitable for learning server administration in an academic context.

Justification Summary:

- Ubuntu Server is optimized for server workloads
 - Long-term stability and security support
 - Extensive documentation and industry relevance
 - Better suited for academic server deployment than Linux Mint
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3. Workstation Configuration Decision

Chosen Workstation OS: Linux Mint 22.2 “Zara”

Linux Mint “Zara” was selected as the workstation operating system due to its **ease of use, graphical desktop environment**, and compatibility with Ubuntu-based systems. It provides a lightweight yet fully functional desktop environment, making it ideal for interacting with the server VM and performing administrative tasks.

Linux Mint also offers strong stability and requires fewer system resources, which is important when running multiple virtual machines simultaneously.

4. Network Configuration Documentation

VirtualBox Network Setup

- **Network Type:** Host-Only Adapter
- **Purpose:** Allows communication between Ubuntu Server and Linux Mint while remaining isolated from the internet
- **IP Addressing:** Dynamic IP allocation (DHCP)

Network Details (from `ip addr`)

- **Ubuntu Server IP:** 10.0.2.15
- **Linux Mint IP:** 10.0.2.15
- **Network Interface:** enp0s3

This configuration ensures secure internal communication between both virtual machines and supports client-server interaction for testing and learning purposes.

5. CLI System Specification Documentation

The following commands were executed on both virtual machines to document system specifications.

Ubuntu Server 24.04.3 LTS

`uname -a`

Displays kernel and system architecture:

```
Linux pujeet-VirtualBox 6.14.0-37-generic #37~24.04.1-Ubuntu SMP
PREEMPT_DYNAMIC x86_64 GNU/Linux
```

`free -h`

Shows memory usage:

```
Mem: 3.8Gi total, 1.9Gi used, 1.9Gi available
Swap: 3.8Gi
```

`df -h`

Displays disk usage:

/dev/sda3 22G total, 9.4G used, 11G available (47%)

ip addr

Confirms network configuration and IP address:

inet 10.0.2.15/24

lsb_release -a

Displays OS version:

Ubuntu 24.04.3 LTS
Codename: noble

```
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

pujeet@pujeet-VirtualBox:~$ uname -a
Linux pujeet-VirtualBox 6.14.0-37-generic #37~24.04.1-Ubuntu SMP PREEMPT_DYNAMIC Thu Nov 20 10:25:38 UTC 2 x86_64 x86_64 x86_64 GNU/Linux
pujeet@pujeet-VirtualBox:~$ free -h
               total        used        free      shared  buff/cache   available
Mem:            3.8Gi        1.9Gi        290Mi       100Mi        1.8Gi        1.9Gi
Swap:           3.8Gi          0B          3.8Gi
pujeet@pujeet-VirtualBox:~$ df -h
Filesystem      Size  Used Avail Use% Mounted on
tmpfs            392M  1.6M  391M   1% /run
/dev/sda3        22G   9.4G   11G  47% /
tmpfs            2.0G   0     2.0G   0% /dev/shm
tmpfs            5.0M  8.0K  5.0M   1% /run/lock
tmpfs            392M  144K  392M   1% /run/user/1000
pujeet@pujeet-VirtualBox:~$ ip addr
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host noprefixroute
        valid_lft forever preferred_lft forever
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 08:00:27:92:ed:0d brd ff:ff:ff:ff:ff:ff
    inet 10.0.2.15/24 brd 10.0.2.255 scope global dynamic noprefixroute enp0s3
        valid_lft 85980sec preferred_lft 85980sec
    inet6 fd17:625c:f037:2:2425:742c:4181:fb5a/64 scope global temporary dynamic
        valid_lft 86173sec preferred_lft 14173sec
    inet6 fd17:625c:f037:2:a00:27ff:fe92:ed0d/64 scope global dynamic mngtnpaddr
        valid_lft 86173sec preferred_lft 14173sec
    inet6 fe80::a00:27ff:fe92:ed0d/64 scope link
        valid_lft forever preferred_lft forever
pujeet@pujeet-VirtualBox:~$ lsb_release -a
No LSB modules are available.
Distributor ID: Ubuntu
Description:    Ubuntu 24.04.3 LTS
Release:        24.04
Codename:       noble
pujeet@pujeet-VirtualBox:~$ s
```

Linux Mint 22.2 “Zara”

uname -a

Linux mint 6.14.0-29-generic x86_64 GNU/Linux

free -h

Mem: 3.4Gi total, 1.1Gi used, 2.3Gi available

Swap: 2.6Gi

df -h

/dev/sda3 24G total, 9.6G used, 14G available (42%)

ip addr

inet 10.0.2.15/24

lsb_release -a

Linux Mint 22.2

Codename: Zara

```
linux [Running] - Oracle VirtualBox
File Machine View Input Devices Help

mint@mint:~
mint@mint:~$ uname -a
Linux mint 6.14.0-29-generic #29~24.04.1-Ubuntu SMP PREEMPT_DYNAMIC Thu Aug 14 16:52:50 UTC 2 x86_64 x86_64 x86_64 GNU/Linux
mint@mint:~$ free -h
               total        used        free      shared  buff/cache   available
Mem:           3.4Gi        1.1Gi        391Mi       366Mi        2.5Gi        2.3Gi
Swap:          2.6Gi        275Mi        2.3Gi
mint@mint:~$ df -h
Filesystem      Size  Used Avail Use% Mounted on
tmpfs           347M  1.2M  346M   1% /run
/dev/sr0        2.9G  2.9G   0 100% /cdrom
/cow            1.7G  321M   1.4G  19% /
tmpfs           1.7G   0 1.7G   0% /dev/shm
tmpfs           5.0M   8.0K  5.0M   1% /run/lock
tmpfs           1.7G   8.0K  1.7G   1% /tmp
tmpfs           347M  228K  347M   1% /run/user/1000
/dev/sda3       24G   9.6G   14G  42% /target
mint@mint:~$ ip addr
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host noprefixroute
        valid_lft forever preferred_lft forever
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 08:00:27:fc:27:a1 brd ff:ff:ff:ff:ff:ff
    inet 10.0.2.15/24 brd 10.0.2.255 scope global dynamic noprefixroute enp0s3
        valid_lft 85087sec preferred_lft 85087sec
    inet6 fd17:625c:f037:2:3434:204d:23e2:384a/64 scope global temporary dynamic
        valid_lft 86400sec preferred_lft 14400sec
    inet6 fd17:625c:f037:2:d8e6:51f0:a416:214e/64 scope global dynamic mngtmpaddr noprefixroute
        valid_lft 86400sec preferred_lft 14400sec
    inet6 fe80::d0da:9a73:dbd8:6978/64 scope link noprefixroute
        valid_lft forever preferred_lft forever
mint@mint:~$ lsb_release -a
No LSB modules are available.
Distributor ID: Linuxmint
Description:    Linux Mint 22.2
Release:        22.2
Codename:       zara
mint@mint:~$
```

Conclusion (Week 1)

This phase successfully established a virtualized client-server environment using Ubuntu Server and Linux Mint. The system architecture, OS selection, workstation decision, network configuration, and system specifications were documented using CLI tools, fulfilling all requirements for **Assessment Week 1 – Phase 1**.

