LAB 01 – Welcome to SysSec!

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1. Installing Different Operating Systems

To understand the installation process for different operating systems i.e. Ubuntu Linux and Windows 10 is important to all users in the field of cybersecurity especially in system security. So to enter commands, we need to pre-install these two operating systems and understand their network connections which may very significantly depending on operating system (Linux and Windows).

So here are few steps to download respective operating systems i.e. Ubuntu Linux and Windows 10.

1.1 Installing Windows 10 Client

For the installation of Windows 10 OS follow :

- We first install and mount an iso file to the system/virtual machine, which in this case is "**F24SysSecWindows.iso**" in "**Win10Client**" virtual machine.
- Select Windows 10 Enterprise LTSC Evaluation and click next.
- Select Custom: Install Windows only (advanced)
- On the "Where do you want to install Windows?" screen, click next.
- Wait for the installation to complete.
- After the installation is complete your system will restart multiple times. Let It Be
- You will be presented with an "Account" screen. Click on the Domain join instead button in the bottom left.
- Type in the username: sysadmin click next. Type in the password: Change.me! click next.
- Make up three security questions and click next.
- From the "Choose your privacy settings for your device" uncheck all options and then click Accept.
- Wait for Windows to complete the installation.
- Then finally, install VMWare Tools on the Win10Client by mounting it on vCenter.

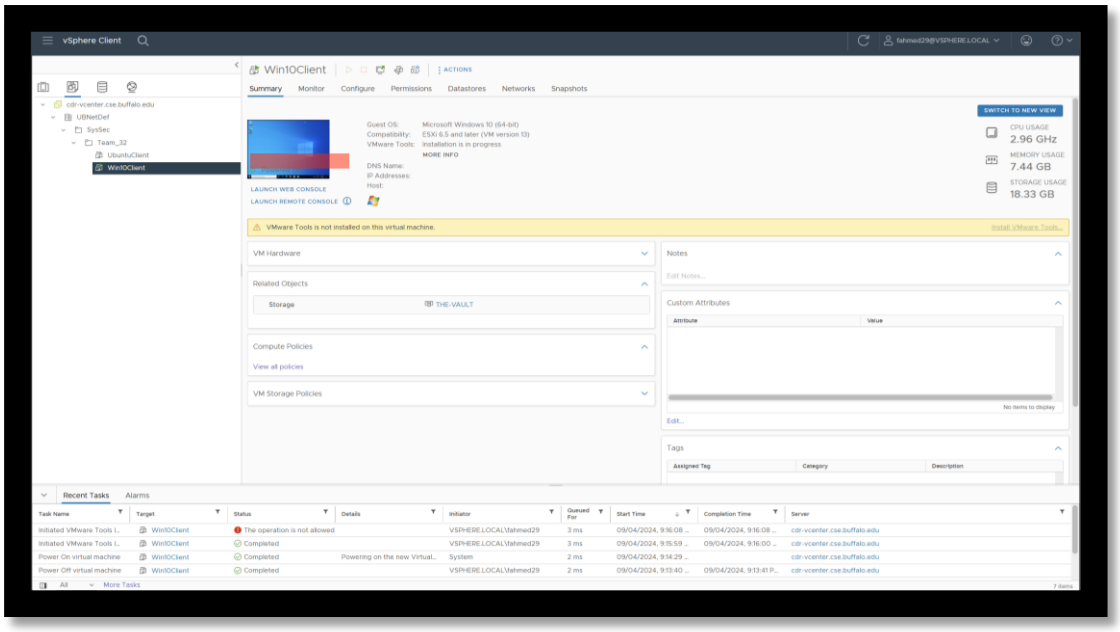

Figure 1: Screenshot of Win10Client

- We can see in the above screenshot, Fig. 1, that the windows desktop client is installed and ready to run. Select “Launch Web Console” as highlighted above to start windows desktop client.

1.2 Installing Ubuntu Linux Client

For the installation of Ubuntu Linux OS follow :

- “Install Ubuntu”
- “Normal Installation” / “Download updates while installing Ubuntu”
- “Erase disk and install Ubuntu”
- “Your name:” sysadmin
- “Your computer’s name:” ubnetdef <XX> such that <XX> designates a two-digit learner team ID (e.g., 05, 12, etc.)
- Credentials (Username : Password) **sysadmin : Change.me!**
- Update the OS either by using software updater application or Use the command line. Then reboot and re-check for updates till it shows none.
- Install Open VM Tools, open the Terminal application.
  Type, execute, and accept follow on prompts using command:
  sudo apt install open-vm-tools-desktop

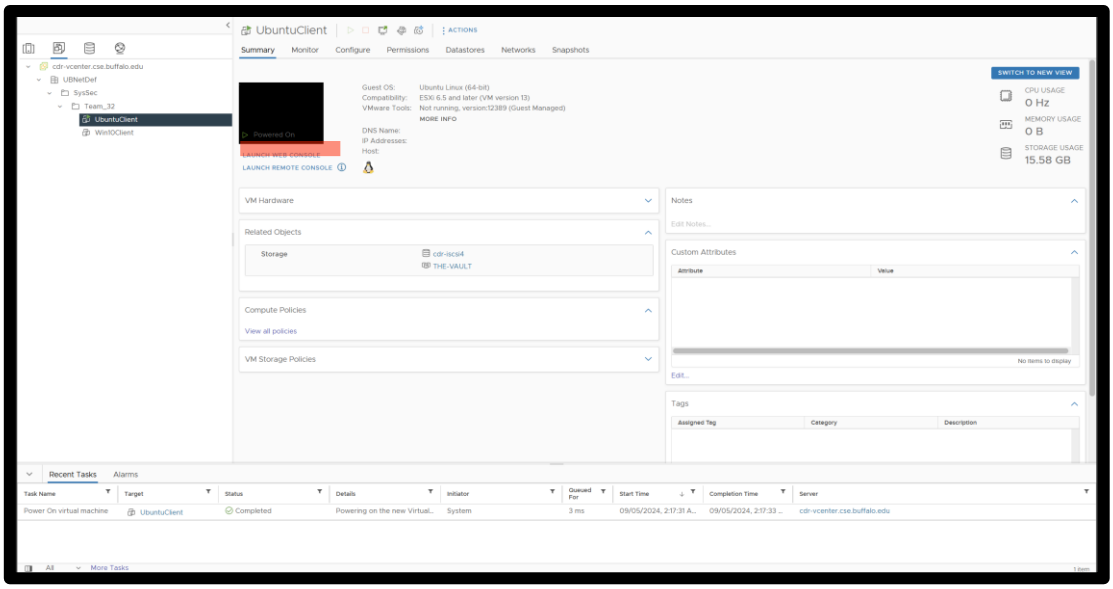

Figure 2: Screenshot of UbuntuClient

- We can see in the above screenshot, Fig. 2, that the Ubuntu Linux desktop client is installed and ready to run. Select “Launch Web Console” as highlighted above to start Ubuntu Linux desktop client.

2. Demonstration of Internet Connectivity (for both clients)

Now we will use some CLI application commands on both Ubuntu and Windows client to check for their internet connectivity.

2.1 Locating and Launching the corresponding CLI application

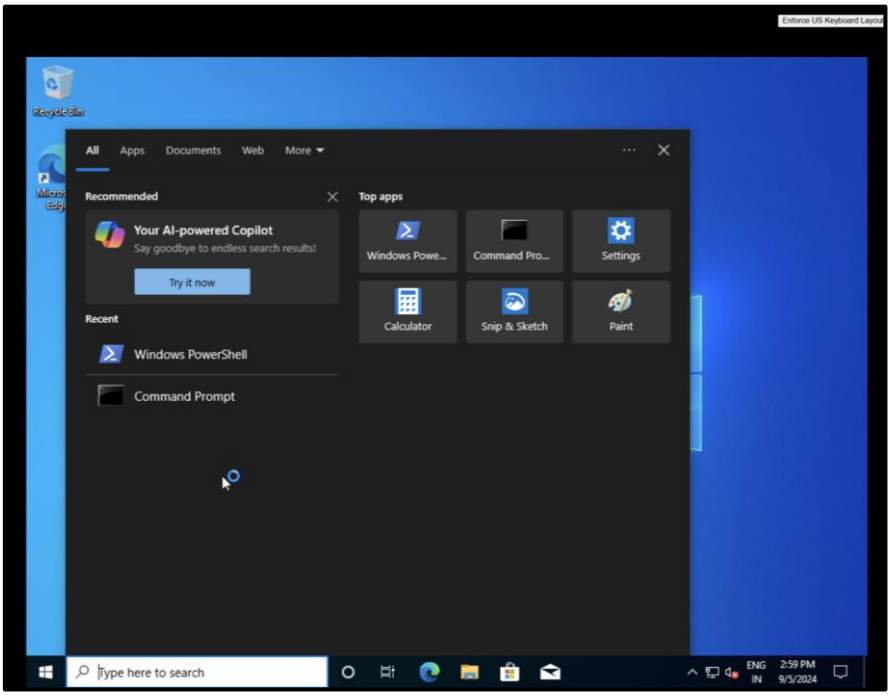

Figure 3: Screenshot of “Windows Powershell” & “CMD” search

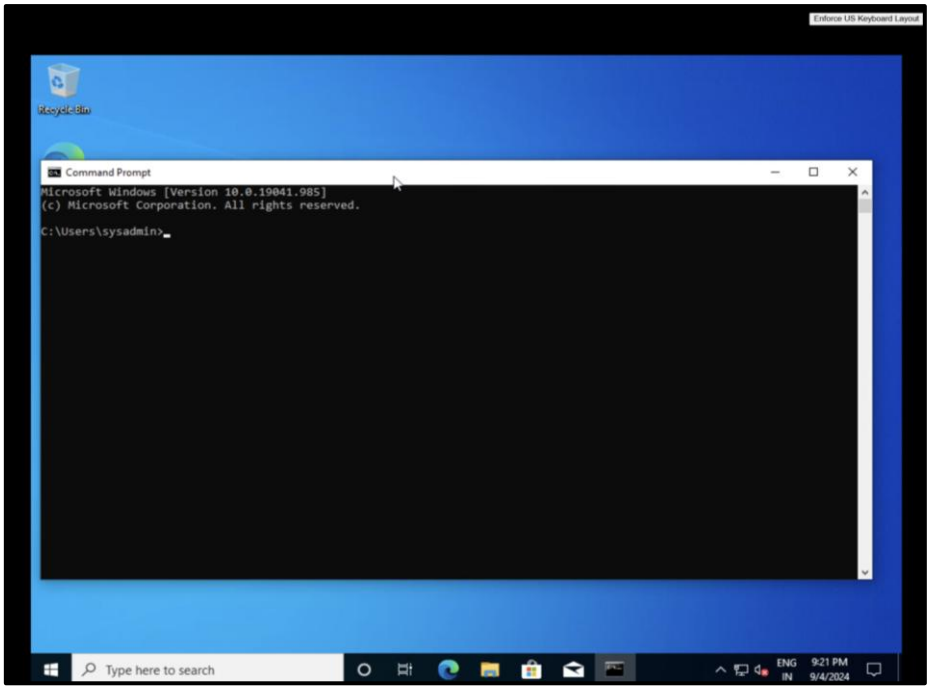

Figure 4: Screenshot of CMD on Windows

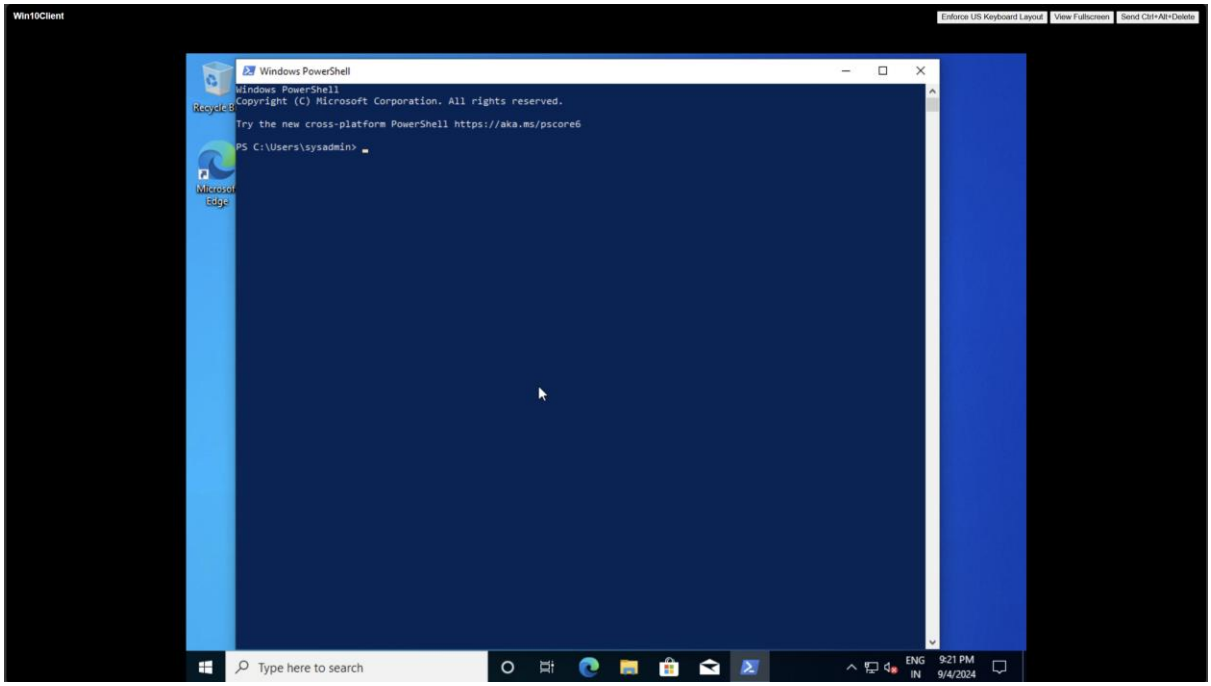

Figure 5: Screenshot of Windows Powershell

- As we can see from both above screenshots, Fig. 4 & 5 that we ran both “Command Prompt” and “Powershell” terminal to execute our command.

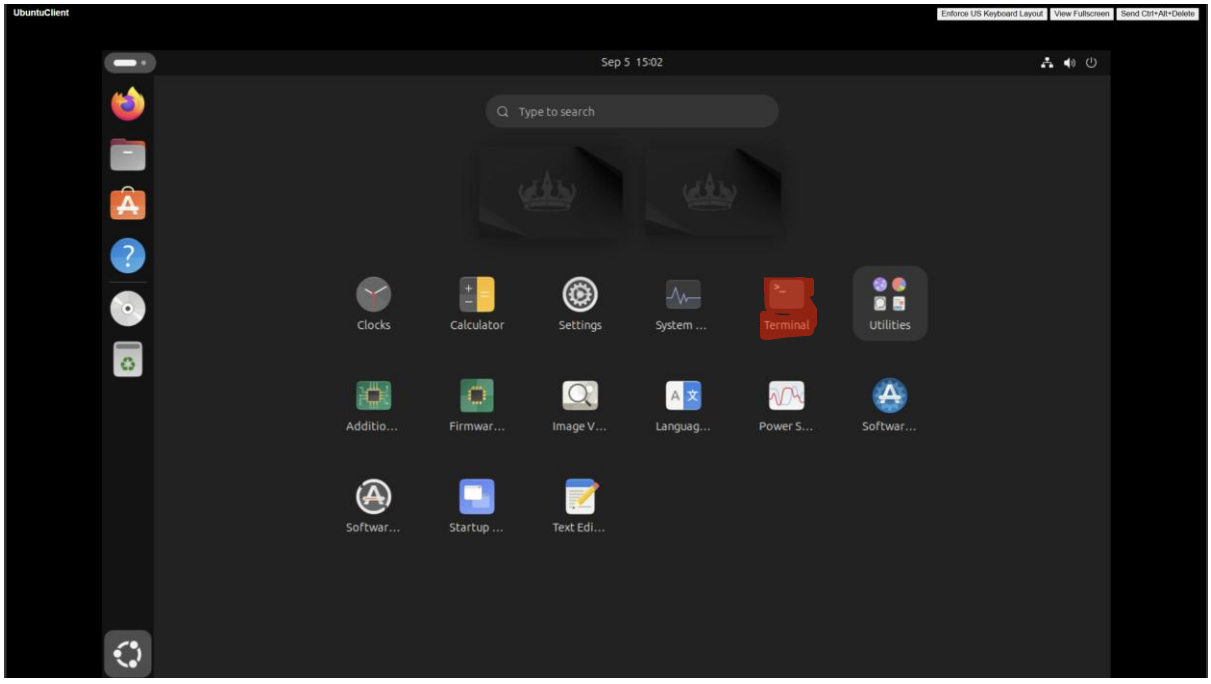

Figure 6: Screenshot of Ubuntu Menu

- We can see in the above screenshot, Fig. 6, the highlighted application called “Terminal” used to execute our commands.

2.2 Checking for Active Connection Properties

- For Windows OS:

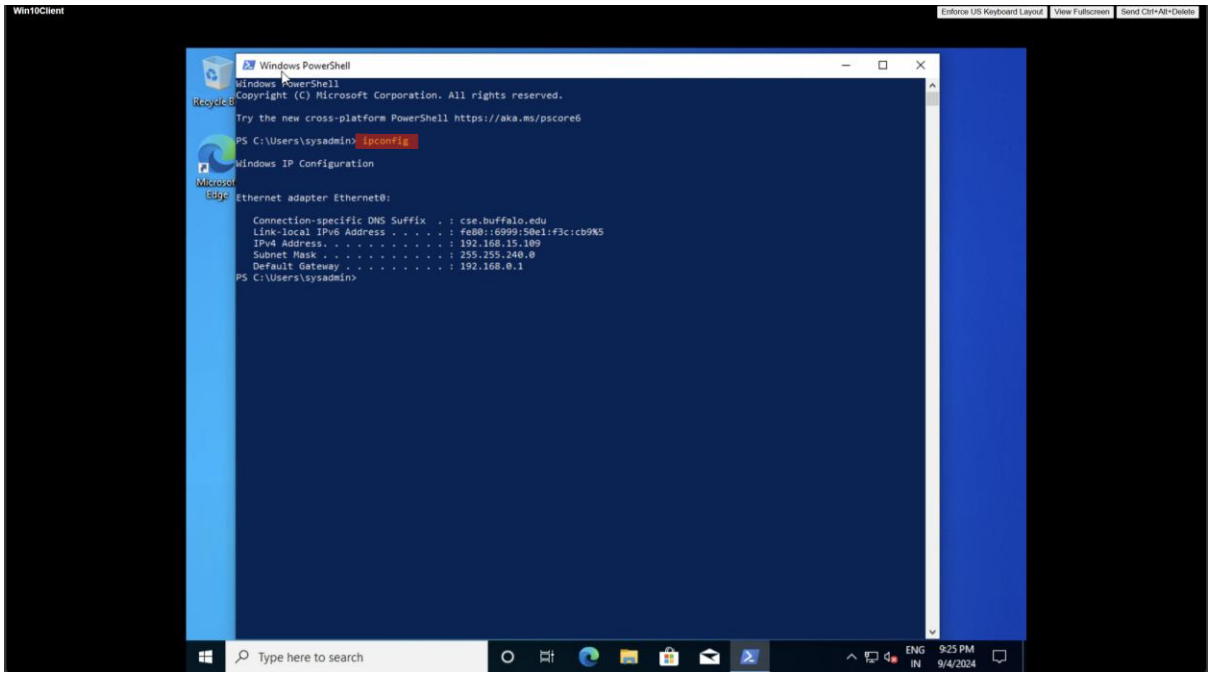

Figure 7: Screenshot of "ipconfig"

➢ Then the first command we wrote is – ipconfig (as highlighted above) which is used to display information about our network configuration and DNS settings. So by entering the command, we get our IP Address, Subnet Mask, and default Gateway.

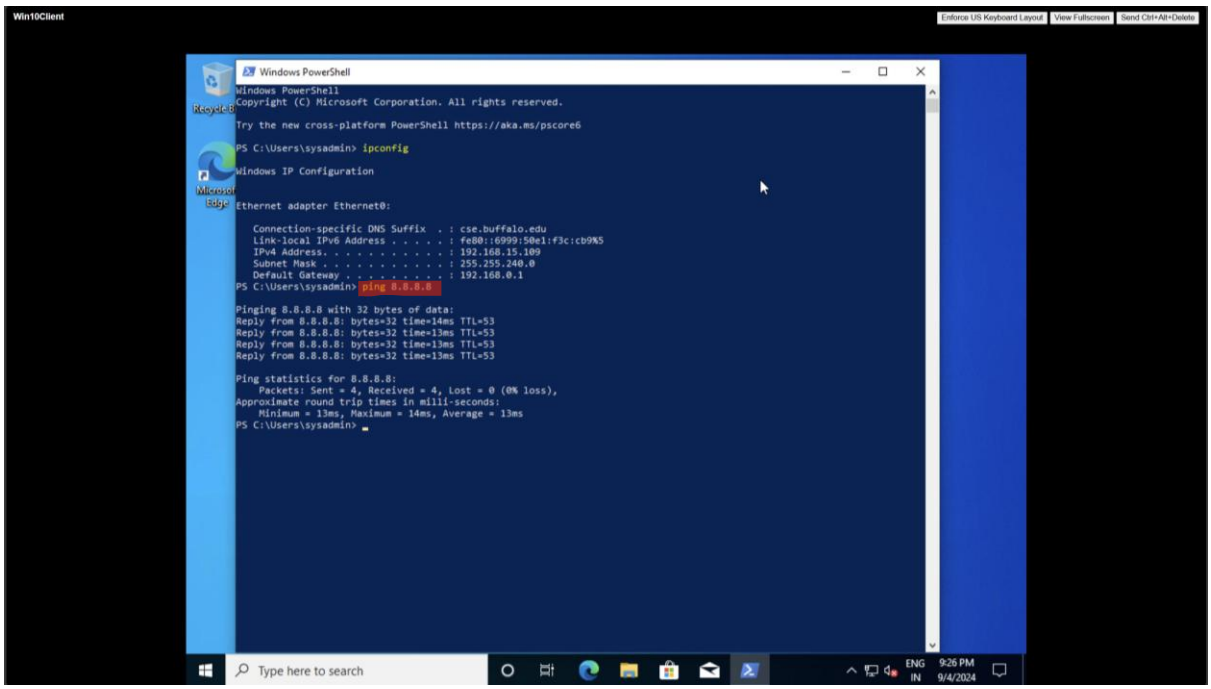

Figure 8: Screenshot of Pinging Google IP on Windows

- After that we wrote command ping **8.8.8.8** which is the ping destination of our network connectivity to the Google DNS Server. By the help of ping, we get an idea of our connectivity, latency and any network issues.

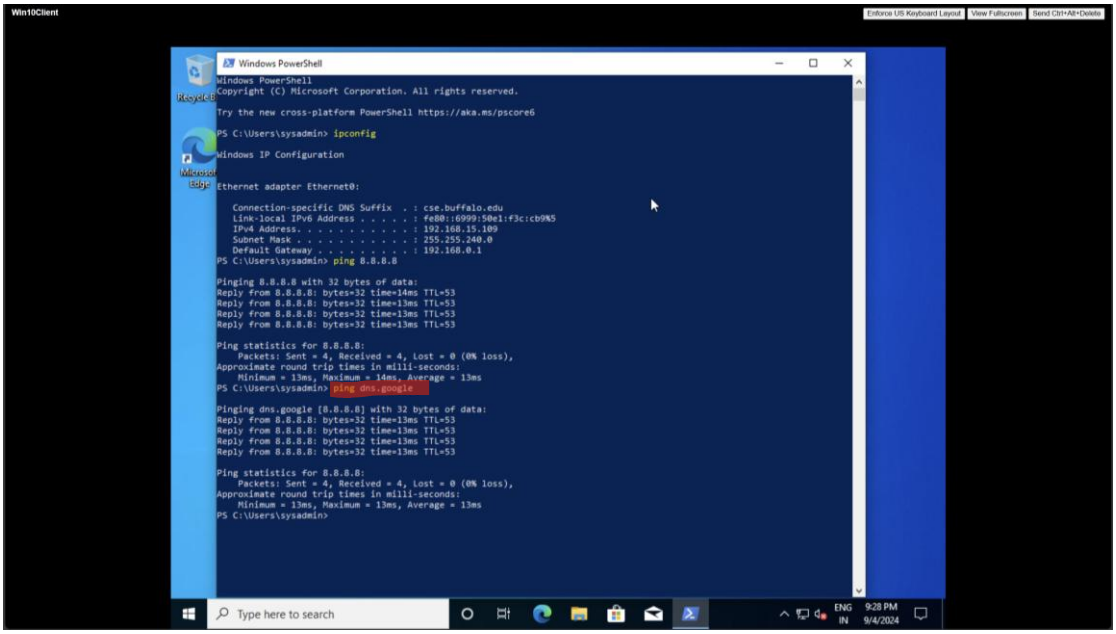

Figure 9: Screenshot of Pinging Google DNS on Windows

- Now we write ping **dns.google** which also have same use as of above command line (ping 8.8.8.8) to test connectivity test between our device and Google DNS server.

- For Linux OS:

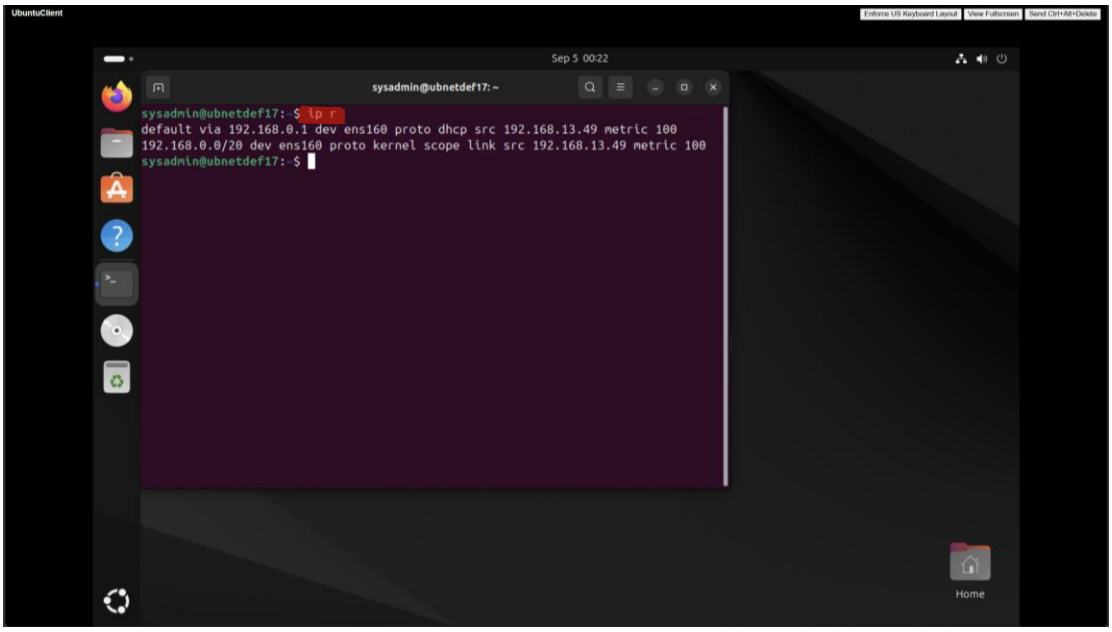

Figure 10: Screenshot of “ip r”

- The first command we wrote is – **ip r** (as highlighted above) which means ip route. It is a table about the paths which network packets takes to reach its destination. So this helps us to find best paths and any blocked network paths.

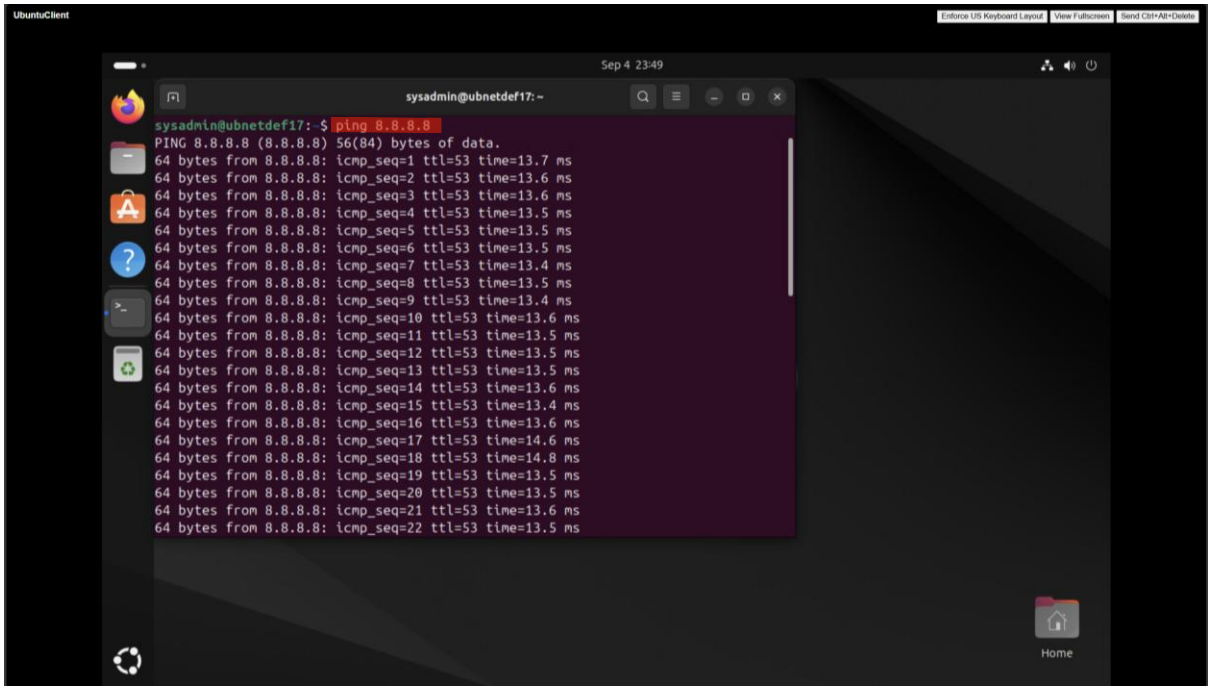

Figure 11: Screenshot of Pinging Google IP on Linux

- After that, we wrote command ping **8.8.8.8** which is the ping destination of our network connectivity to the Google DNS Server. By the help of ping, we get an idea of our connectivity, latency and any network issues.
- The ping command (like above) sends packets continuously until you stop it manually. This is why the output keeps on going. The continuous output allows you to monitor ongoing network performance and detect any issues. We can terminate the continuous output by pressing “ctrl + c”.

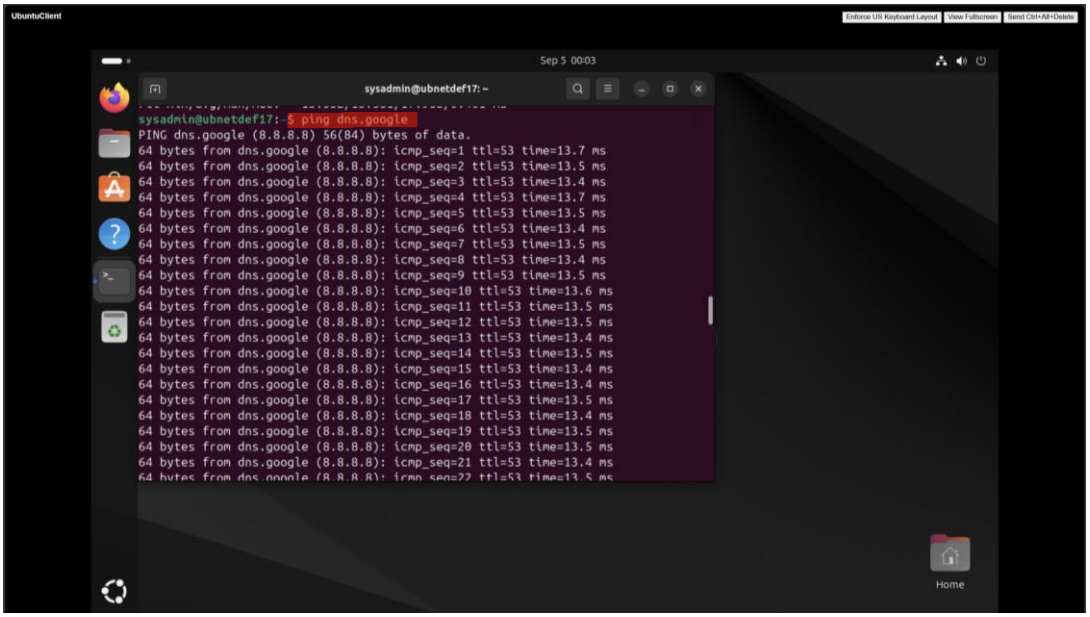

Figure 12: Screenshot of Pinging Google DNS on Linux

- Now we write ping **dns.google** which also have same use as of above command line (ping 8.8.8.8) to test connectivity test between our device and Google DNS server.

Appendix A: Showcasing a Topology

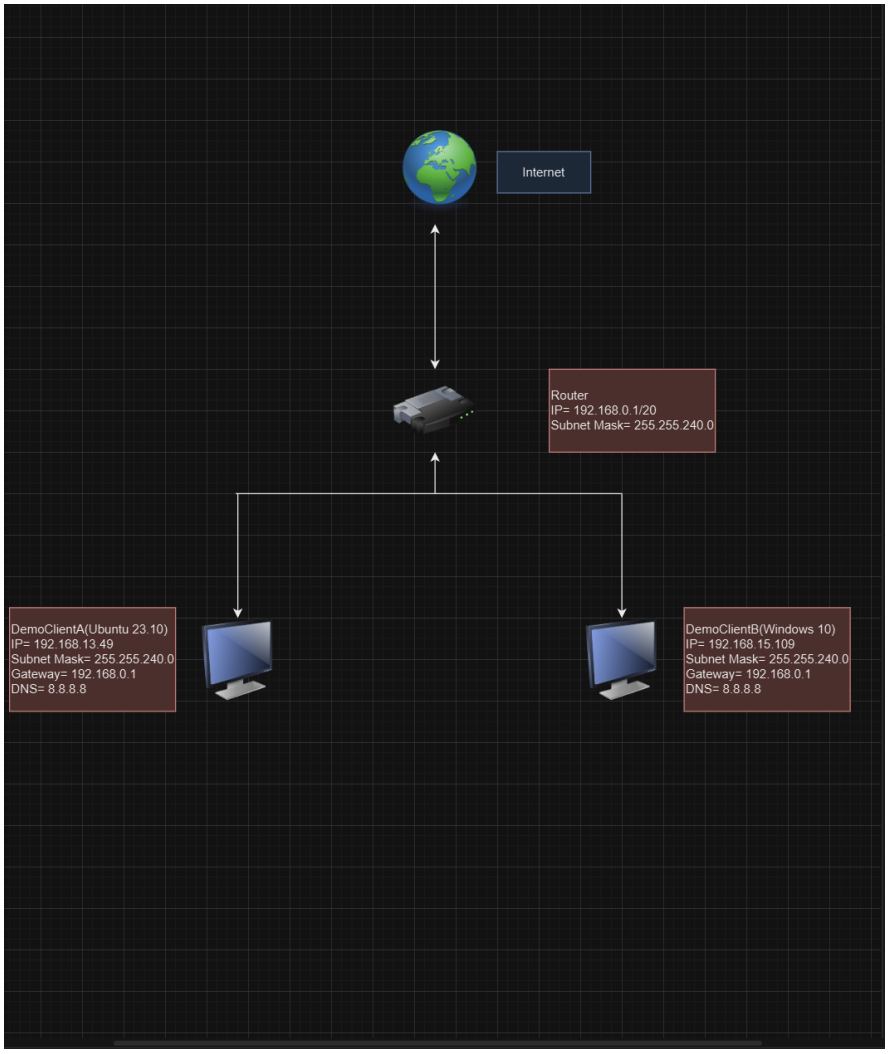

Figure 13: Screenshot of Topology

➢ In the above Topography, there are three different functions in this Topology :-

- Internet Connectivity- The Main Router (black box in the centre) is connected to the internet (globe) to making external network access.
- Router- It acts as a central hub, facilitating connections between internal devices (Client Devices) and the external Internet (IP of router is **192.168.0.1/20** where /20 is netmask).
- Client Devices A&B- Two client A&B are using there devices which connect monitors to the router which makes it connected to the internet these making internal to external connection (IP **192.168.13.49** for Ubuntu client and IP **192.168.15.109** for Windows client).