LAB 1: Setting up Environment

I. Purpose

Set up the environment for malware testing by using Kali Linux as DNS server, and Windows Server 2008 as victim running on VMware to simulate and observe simulated network traffic using INetSim

II. Target

- Configure Kali (NAT) and INetSim to respond to DNS/HTTP queries from Windows machines
- Set up Window VM to point DNS to Kali and check InetSim page via browser
- Use nmap on Windows to scan fake domain (YOURNAME.com) and record services simulated by INetSim

III. Lab instruction:

1. Set up virtual machine

Firstly, download and unzip the file Window Server 2008

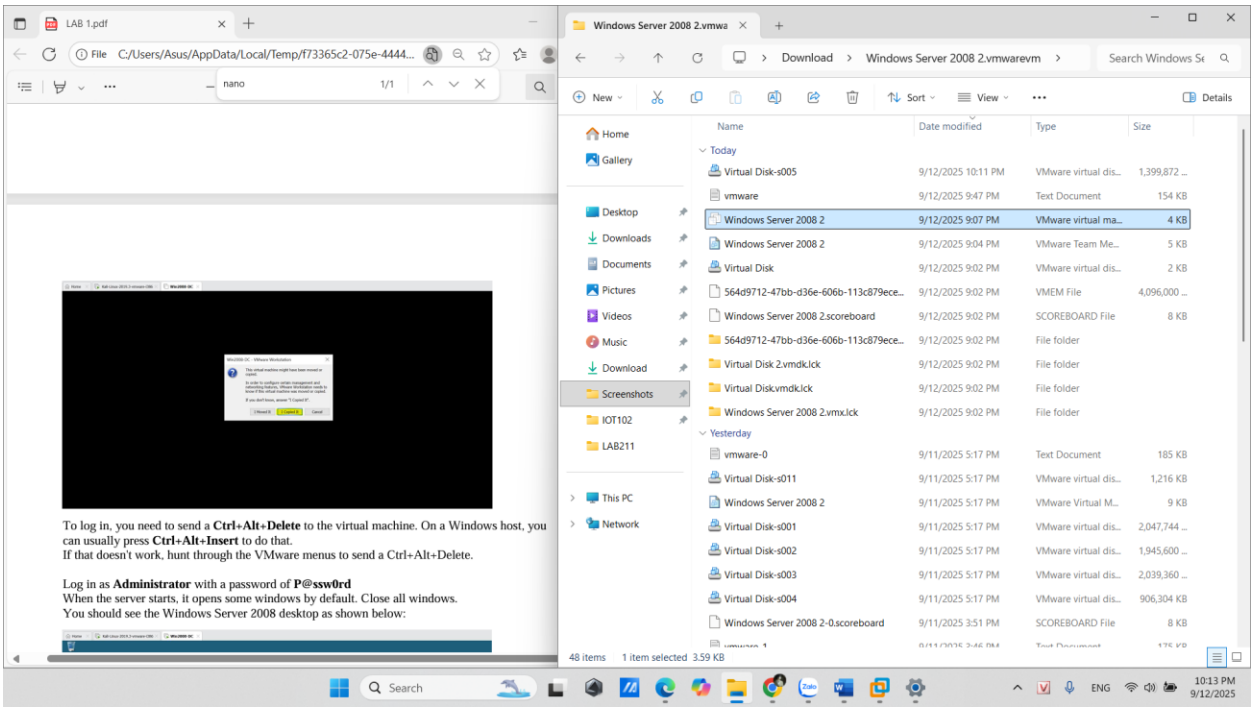


Fig 1.1: Window Server 2008

I also download the .iso file of Kali Linux

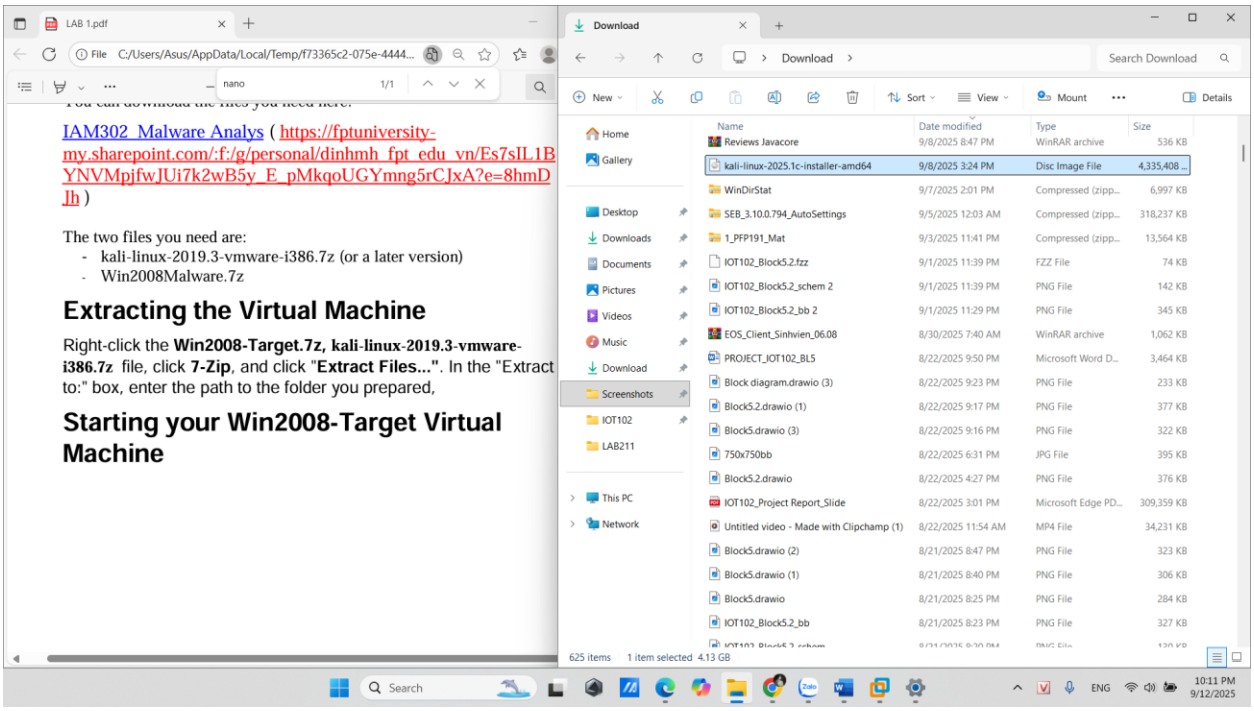
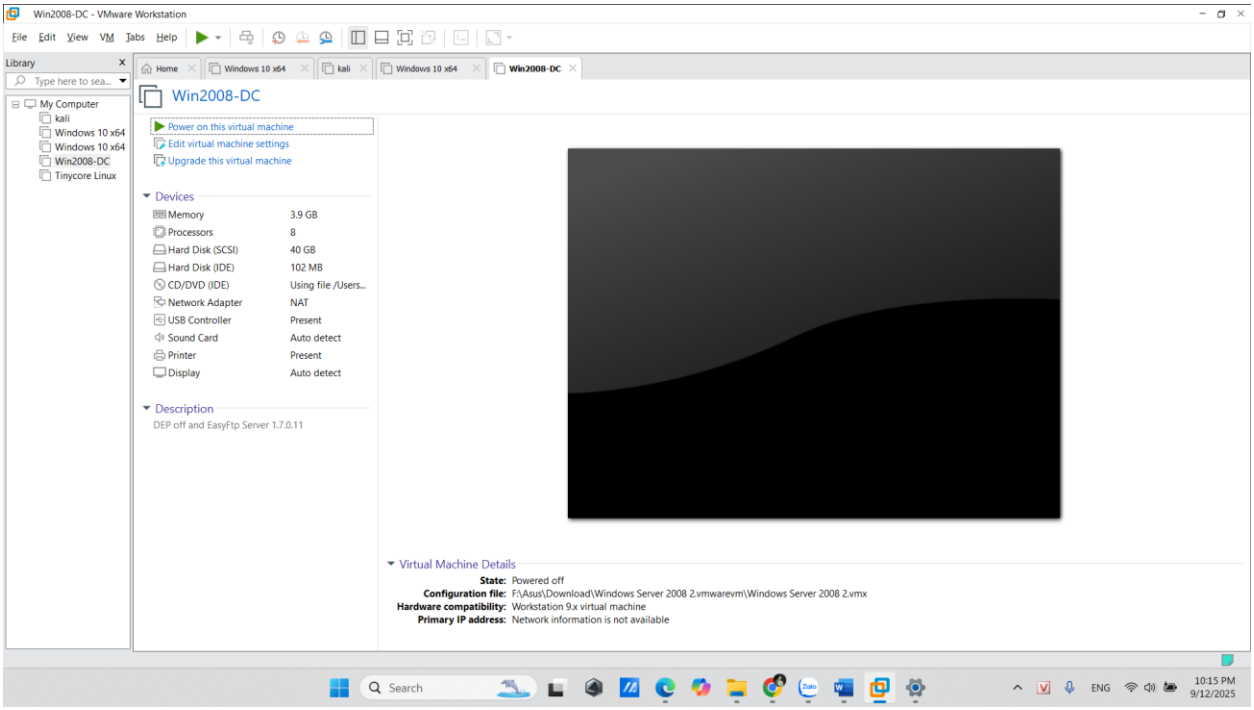


Fig 1.2: Kali Linux

Next, I import two virtual machine into VMware Workstation



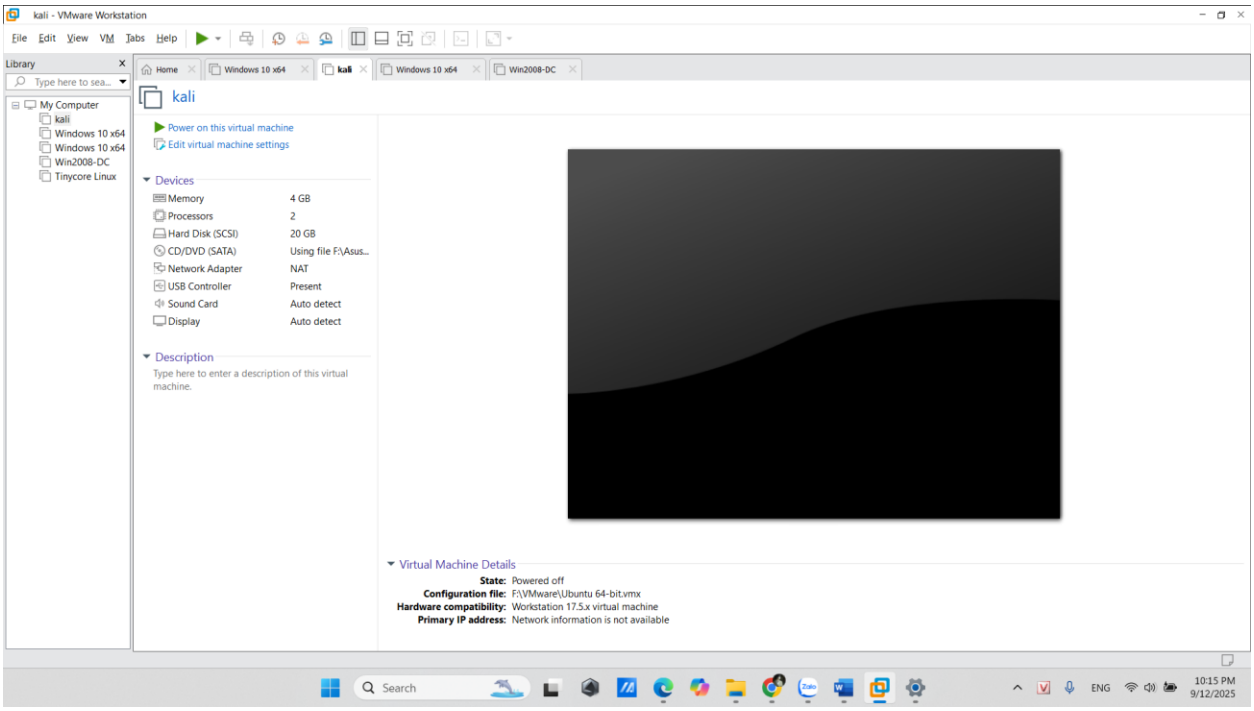


Fig 1.3, 1.4: Setting virtual machine in VMware

Log in Windows Server 2008 (target), log in as **Adminstrator**

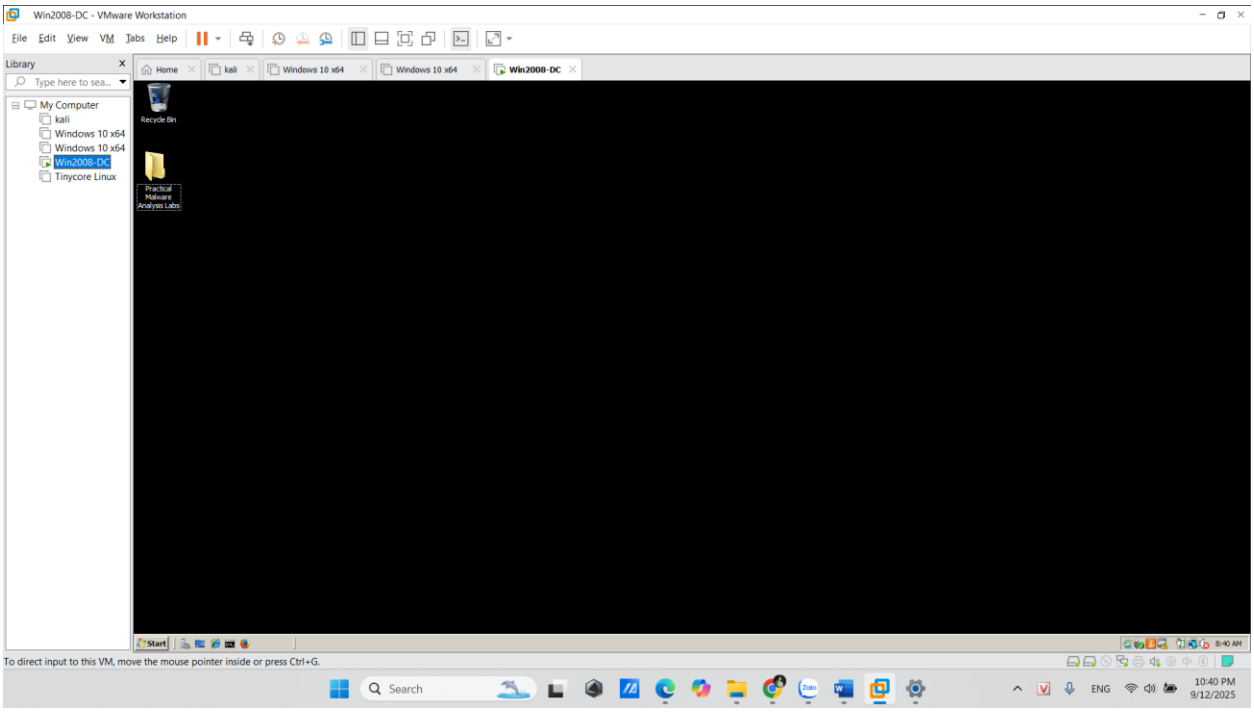


Fig 1.5: Window Server login screen

Log in Kali with the username **root** and a password of **toor**

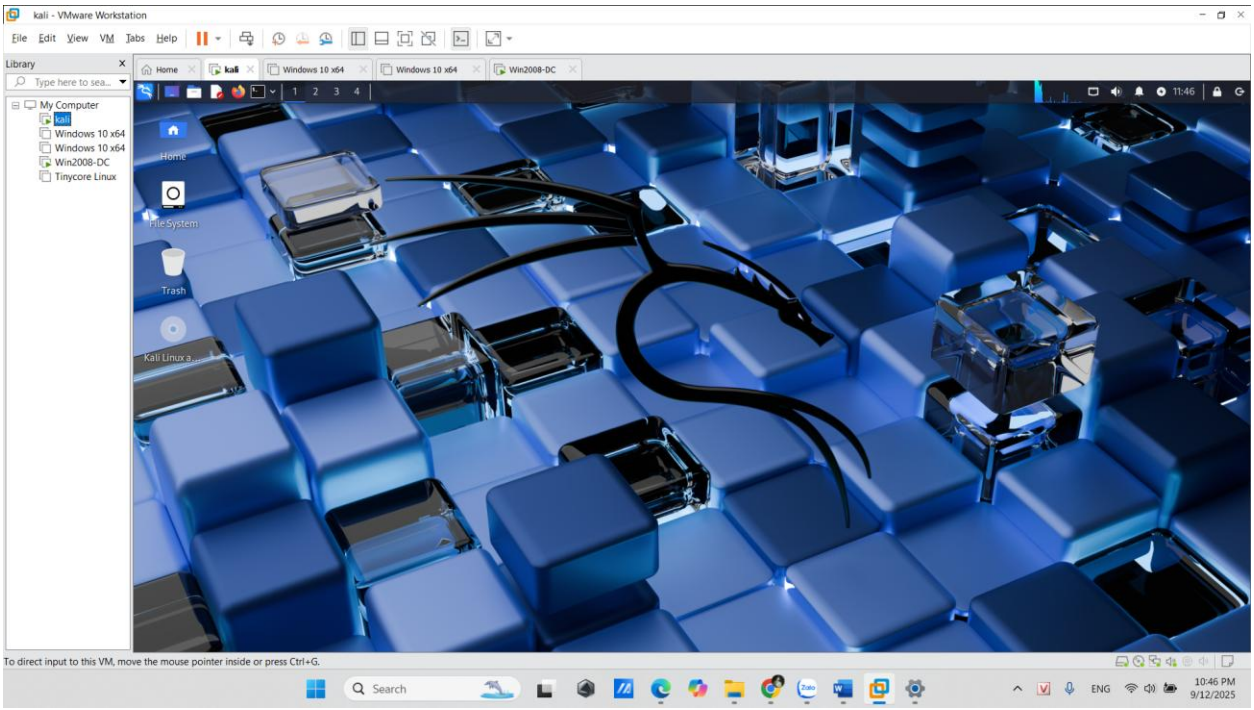


Fig 1.6: Kali Linux login screen

2. Setting the Kali Linux VM to NAT Networking

In the setting, change the **Network Adapter** of Kali into **NAT,** that let the VM can share their own specific IP Address with host machine.

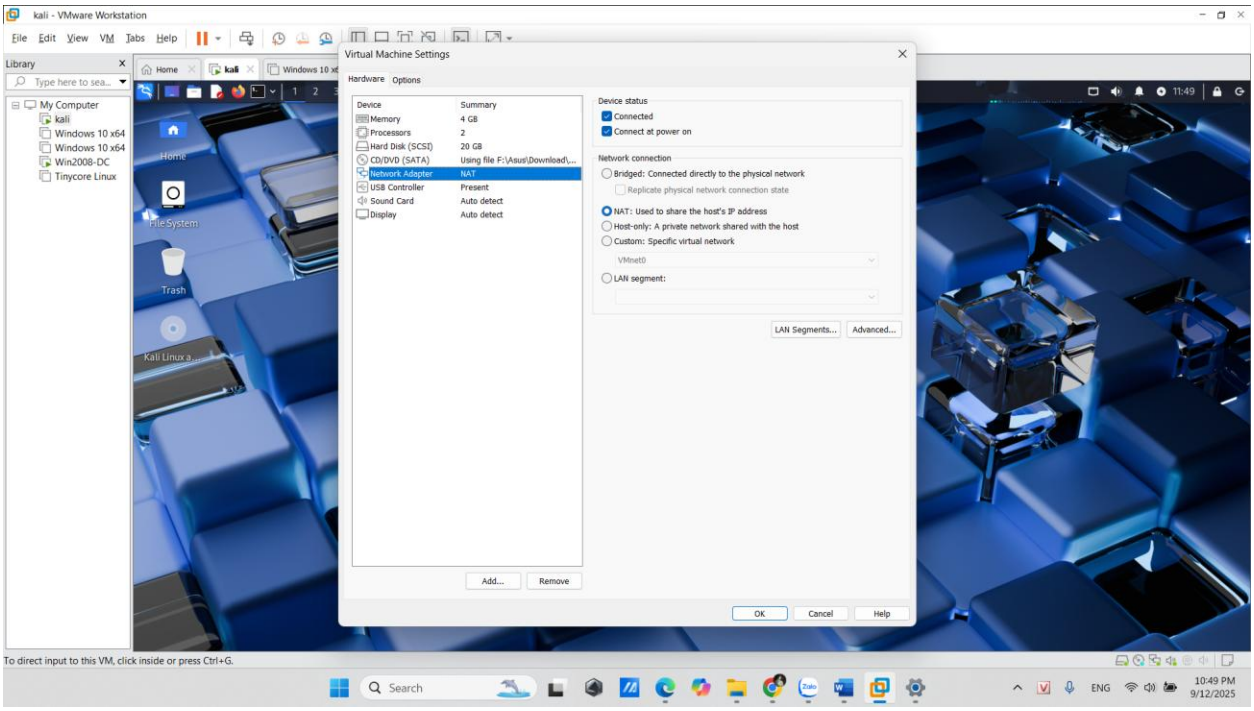


Fig 2.1: Virtual Machine Settings – Network Adapter Tab

3. Finding the Kali Machine's IP Address

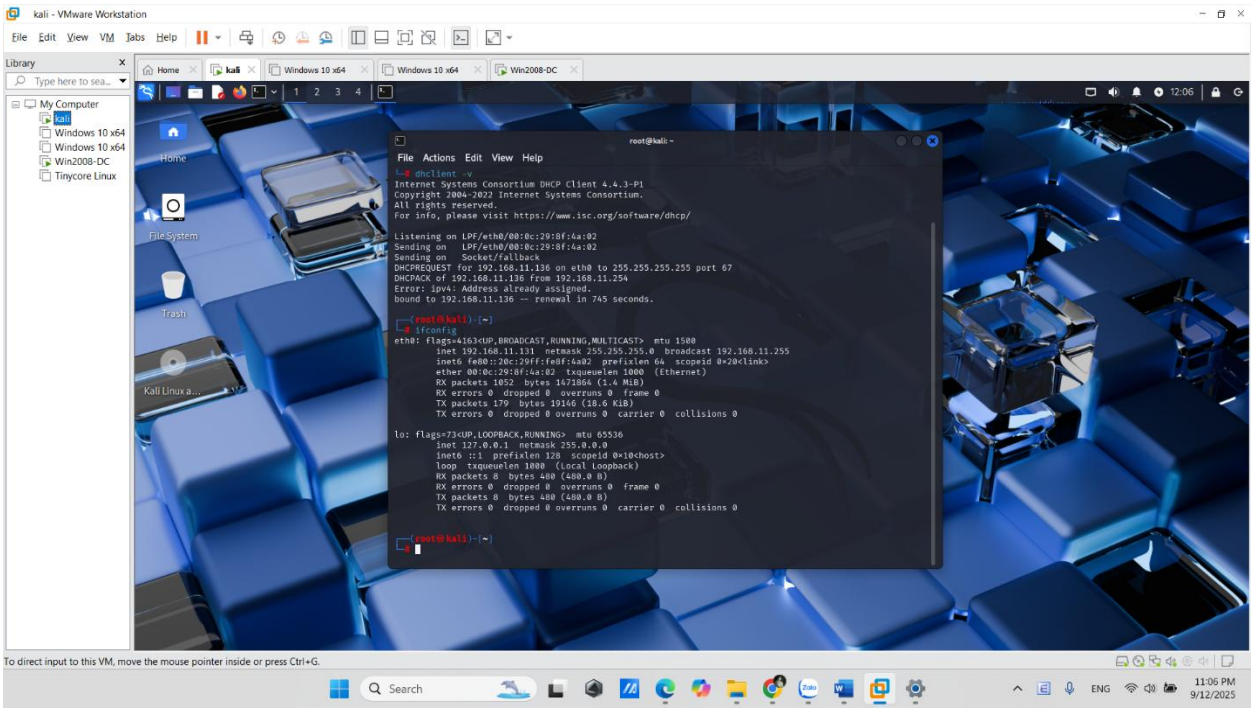


Fig 3.1: Kali Linux run dhcp on each adapter

4. Checking for a Web server and Configuring INetSim

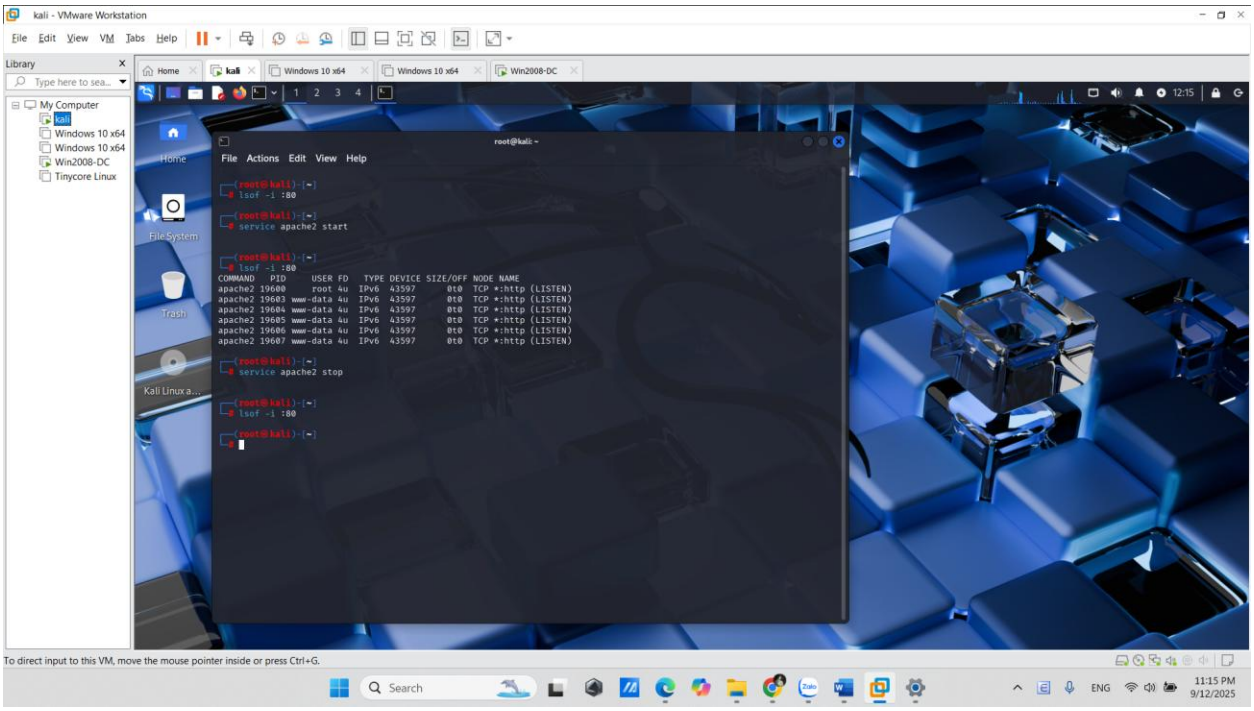


Fig 4.1: List of process that using port 80

After starting apache2 for web server, we stop them and move to next step

First, backup config file: **cp /etc/inetsim/inetsim.conf /etc/inetsim/inetsim.conf.orig**

And then open config: **nano /etc/inetsim/inetsim.conf**

Note: Edit your IP address to your local IP you've got from previous step

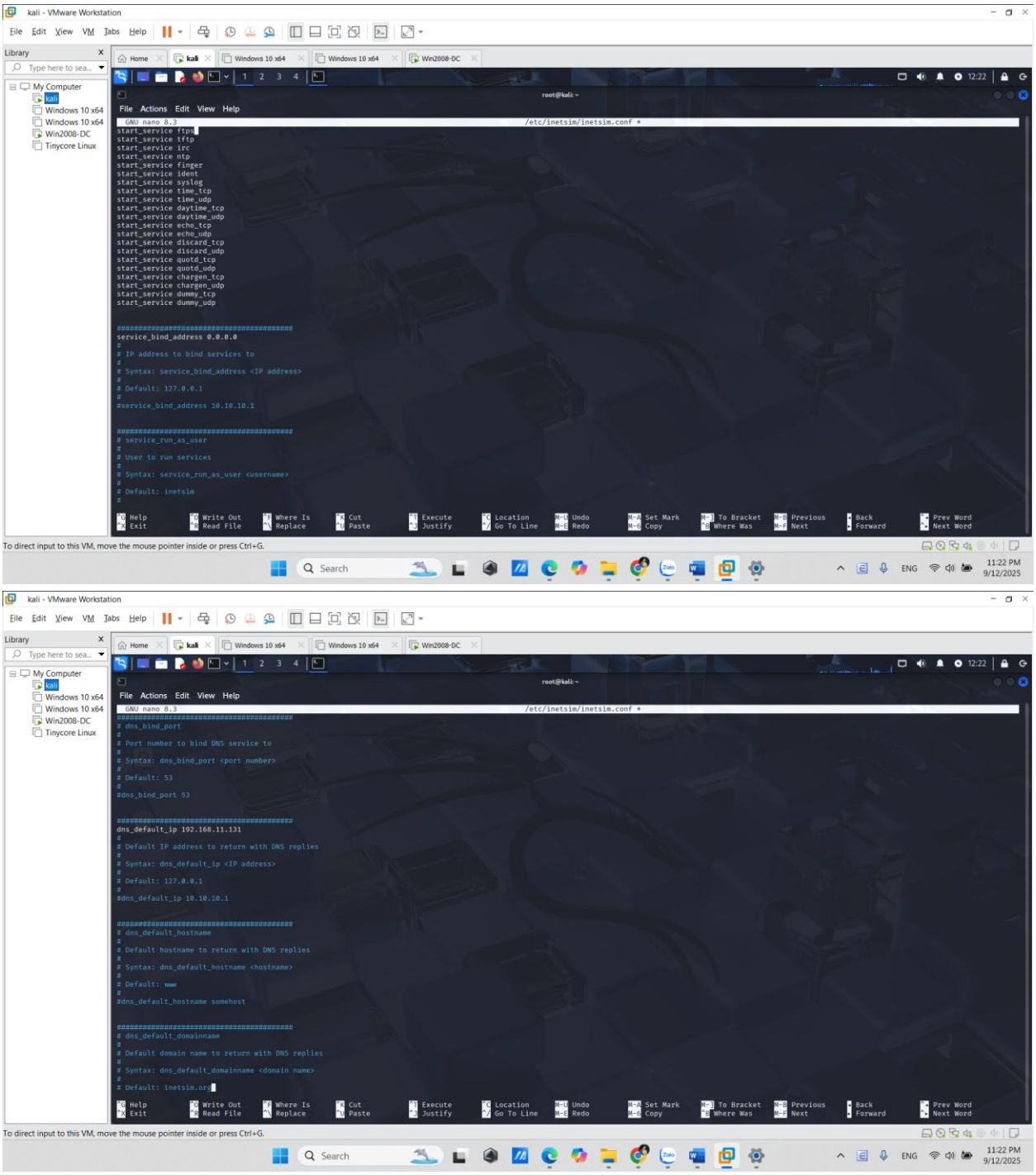


Fig 4.2: inetsim.conf

Safe it and then execute **inetsim**

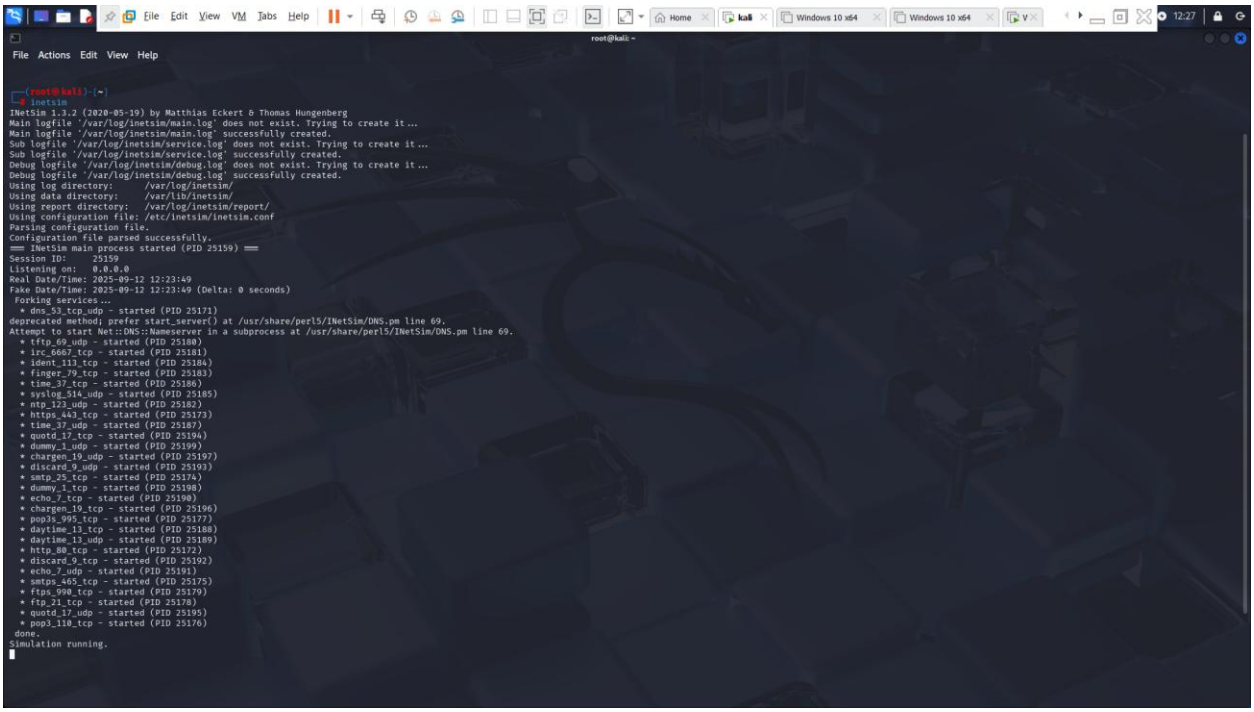
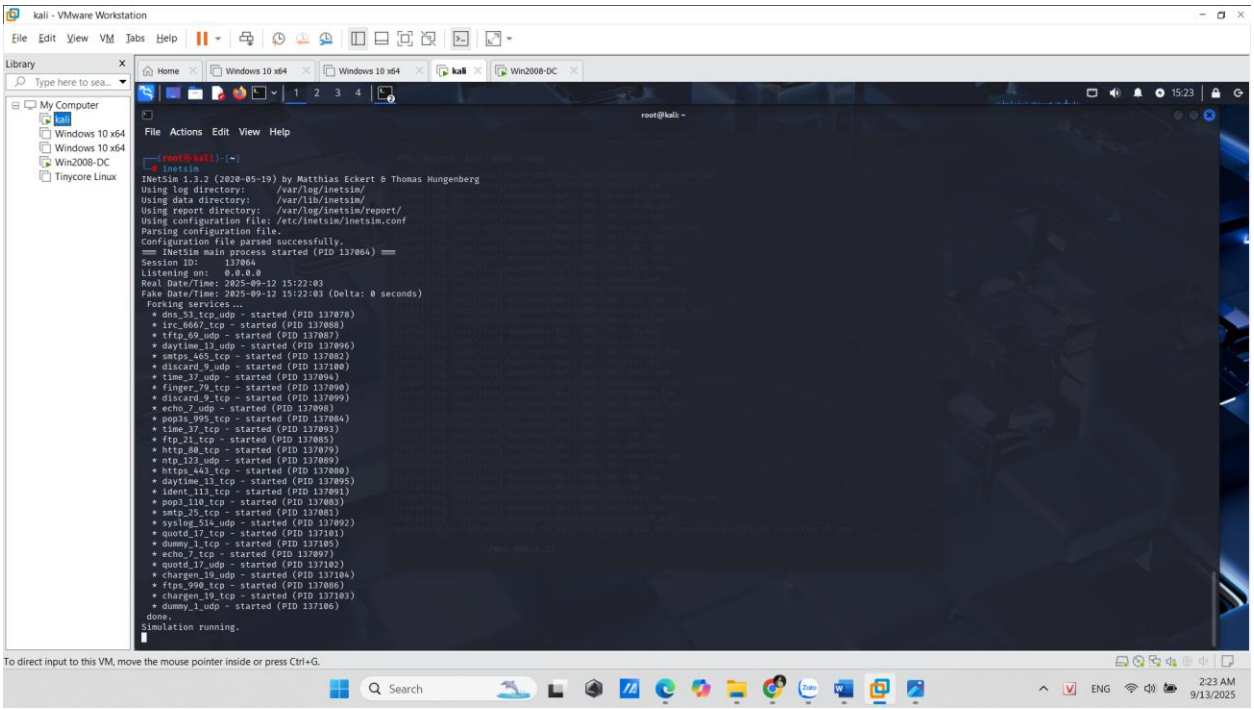


Fig 4.3: inetsim running

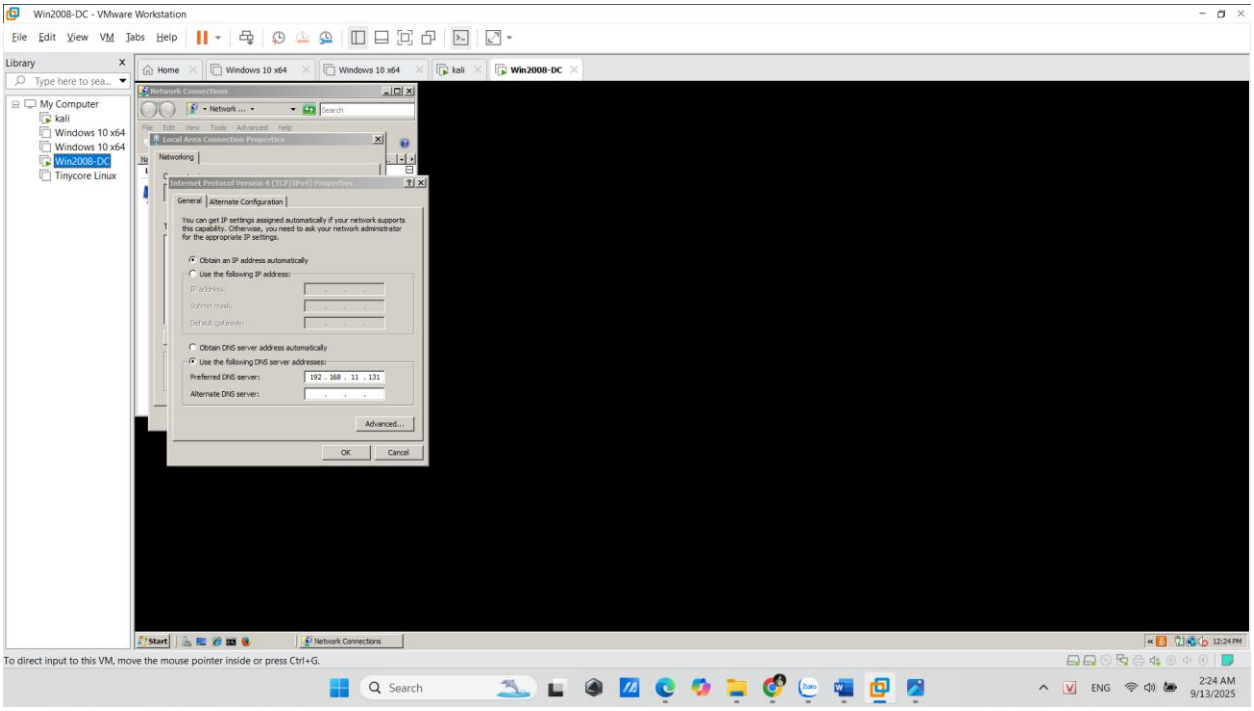
When running INetSim, an error occurred due to a missing or outdated **Net::DNS** Perl module. To fix it, we manually downloaded and installed the correct version using the following commands:

```
curl -LO https://www.net-dns.org/download/Net-DNS-1.22.tar.gz

tar -xvzf Net-DNS-1.22.tar.gz

cd Net-DNS-1.22

perl Makefile.PL

make

sudo make install

perl -MNet::DNS -e 'print "$Net::DNS::VERSION\n"'
```

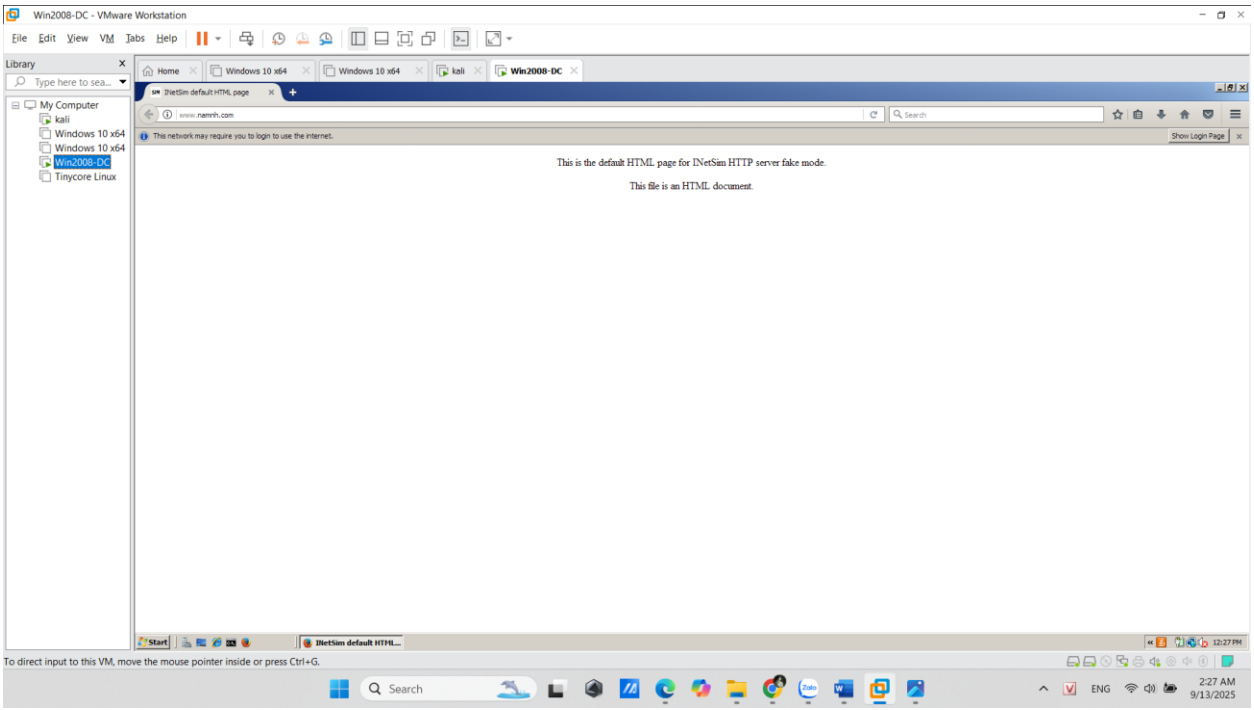


After this, it’s working perfectly, no more error

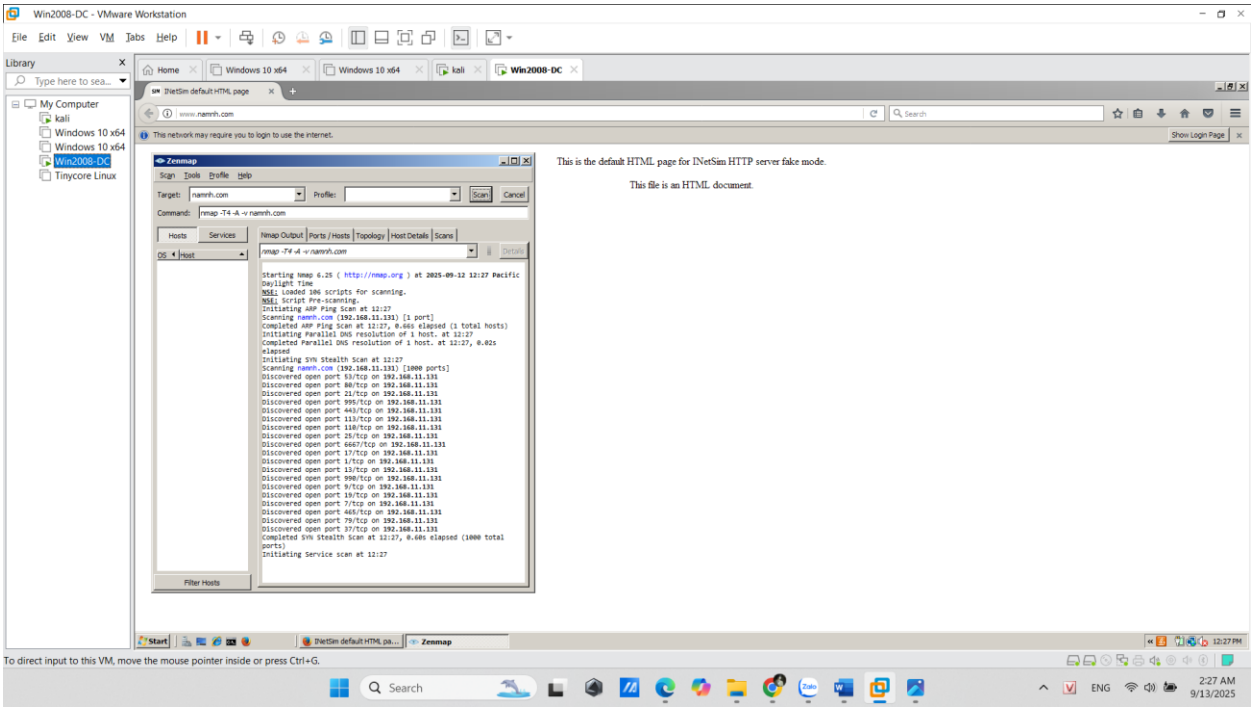
5. Network Configuration for Windows VM (DNS)



Test HTTP on Windows (open YOURNAME.com)



Scanning YOURNAME.com



IV. Summary

- This lab focuses solely on configuring a self-hosted DNS responder on Kali Linux.
- All steps proceeded as expected except **Step 3**: on newer Kali releases you must downgrade/install Net::DNS (use Net-DNS-1.22) to resolve compatibility errors so INetSim runs correctly.

Additional Question

1. PE (Portable Executable) Structure of Windows

- PE is a file format for executable files used in the Windows operating system, based on the COFF (Common Object File Format) file format

- A PE file is a data structure that contains the information needed for the operation system loader to load that executable file into memory and execute it
- **Structure:**
    - **DOS Header:** Every PE file begins with a 64-byte structure, which is what makes the PE file an MS-DOS executable
    - **DOS Stub:** It's a small MS-DOS 2.0, compatible executable that simply print the error message when the program is run in DOS mode
    - **NT Header:** consists of three main part:
        - **PE Signature:** A 4-byte signature that identifies the file as a PE file
        - **File Header:** A Standard COFF. It contains some information about the PE files
        - **Optional Header:** The most important header of the NT Header, because some file like object files do not have this header, however, this header is required for image files. Provide important information to the operating system loader
    - **Section Table:** located right after the Optional Header, is an array of Image Section Header, each section in the PE file has a section header; Each header contains information about the section it references
    - **Sections:** where the actual contents of the file are stored, including things like data and resources that the program uses, as well as the actual code of the program. There are several sections, each with its own purpose.

2. What is the differences between NAT, Host-only and Bridge in VMware Network Adapter?

- **NAT (Network Address Translation):**
    - Connect VM to Internet via host, more secure, not directly accessed
    - Used for personal lab
- **Bridged:**
    - VM as a device on LAN
    - Used when needing to access/be accessed from real network
- **Host-only**
    - Isolate VM from host or between VMs
    - Used for malware analysis without allowing access to the Internet