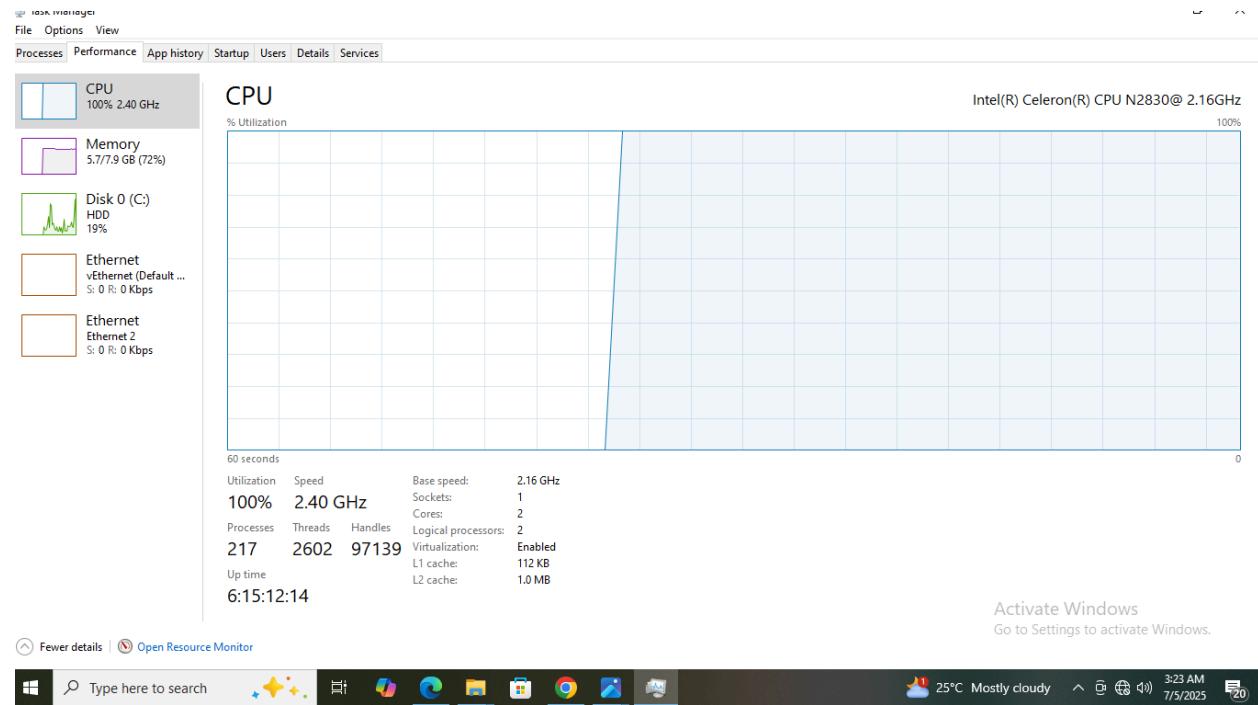


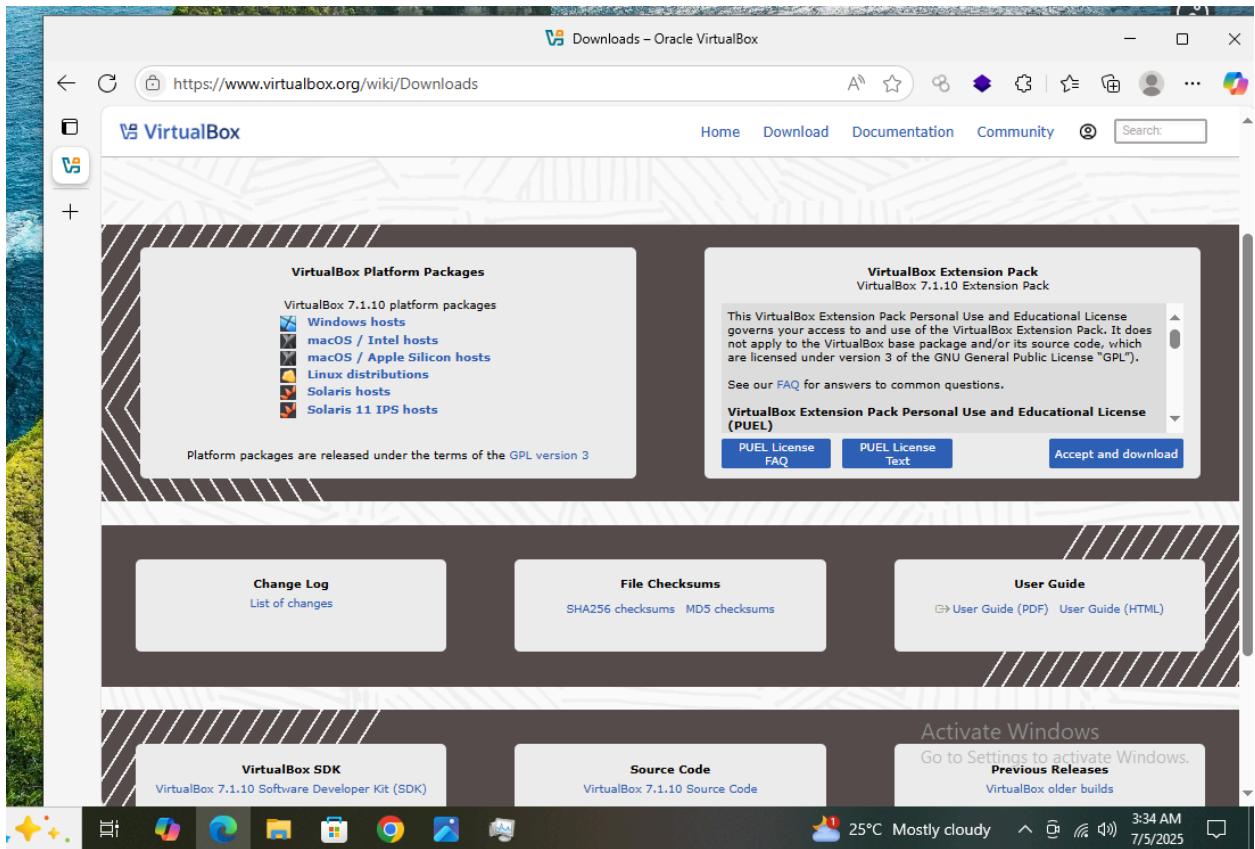
VIRTUAL CYBERSECURITY LAB SETUP

Setting up a cybersecurity lab is an interesting but difficult task to carry out.

First, I downloaded an hypervisor known as virtualbox. A virtual environment where the virtual machines can coexist. But before this, I made sure i enabled my virtualization from task manager in the host machine.



From here I went straight to download the hypervisor(virtualbox) and the virtualbox extension pack as shown in the screenshot below:



I downloaded the hypervisor and installed the hypervisor first because the extension pack will be installed in the virtualbox.



ORACLE

Press F12 to select boot device.



ORACLE

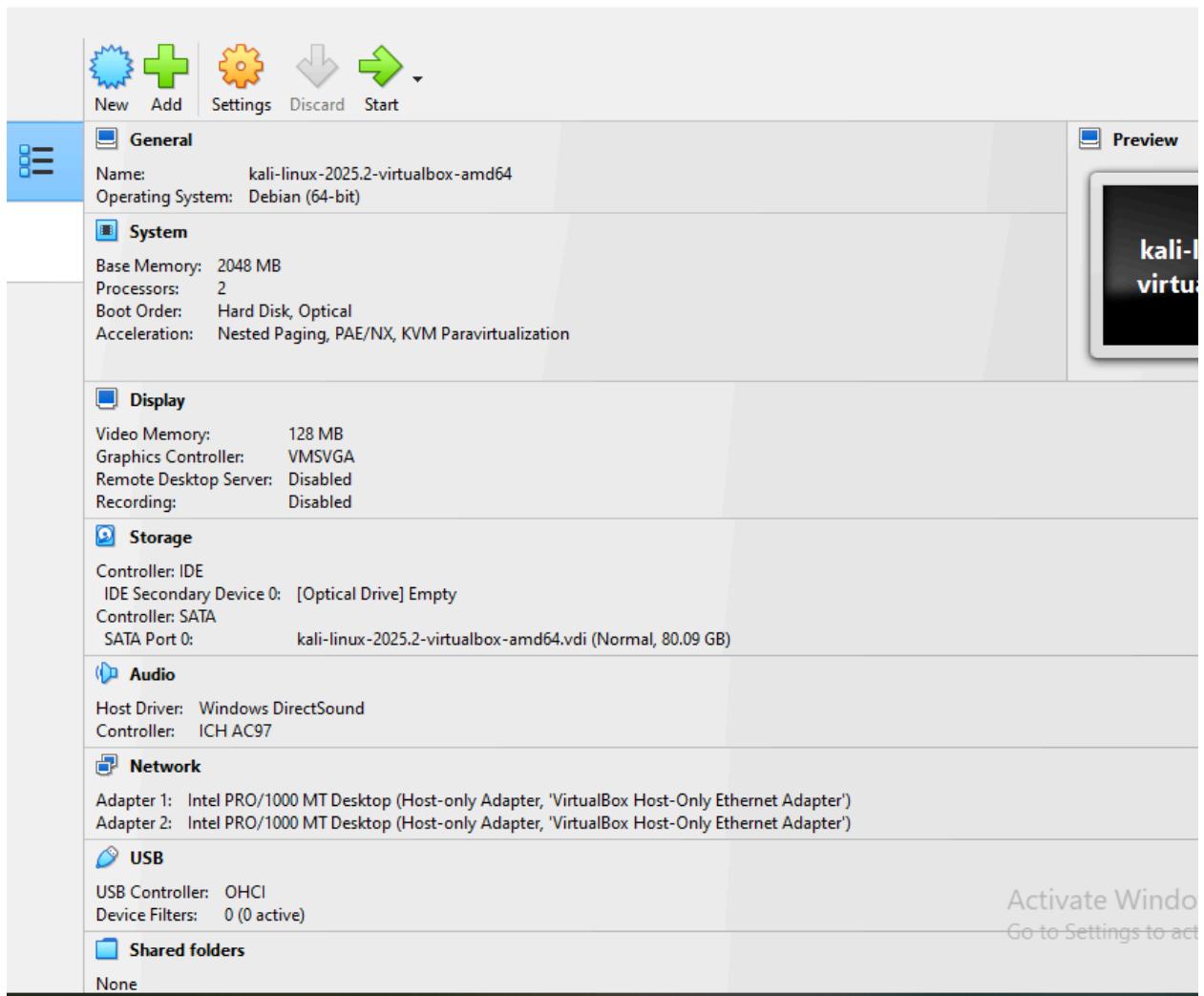
Press F12 to select boot device.

Then i proceeded to downloading the virtual machines, Kali Linux and Window 7 ISO Image that will coexist inside the virtualbox

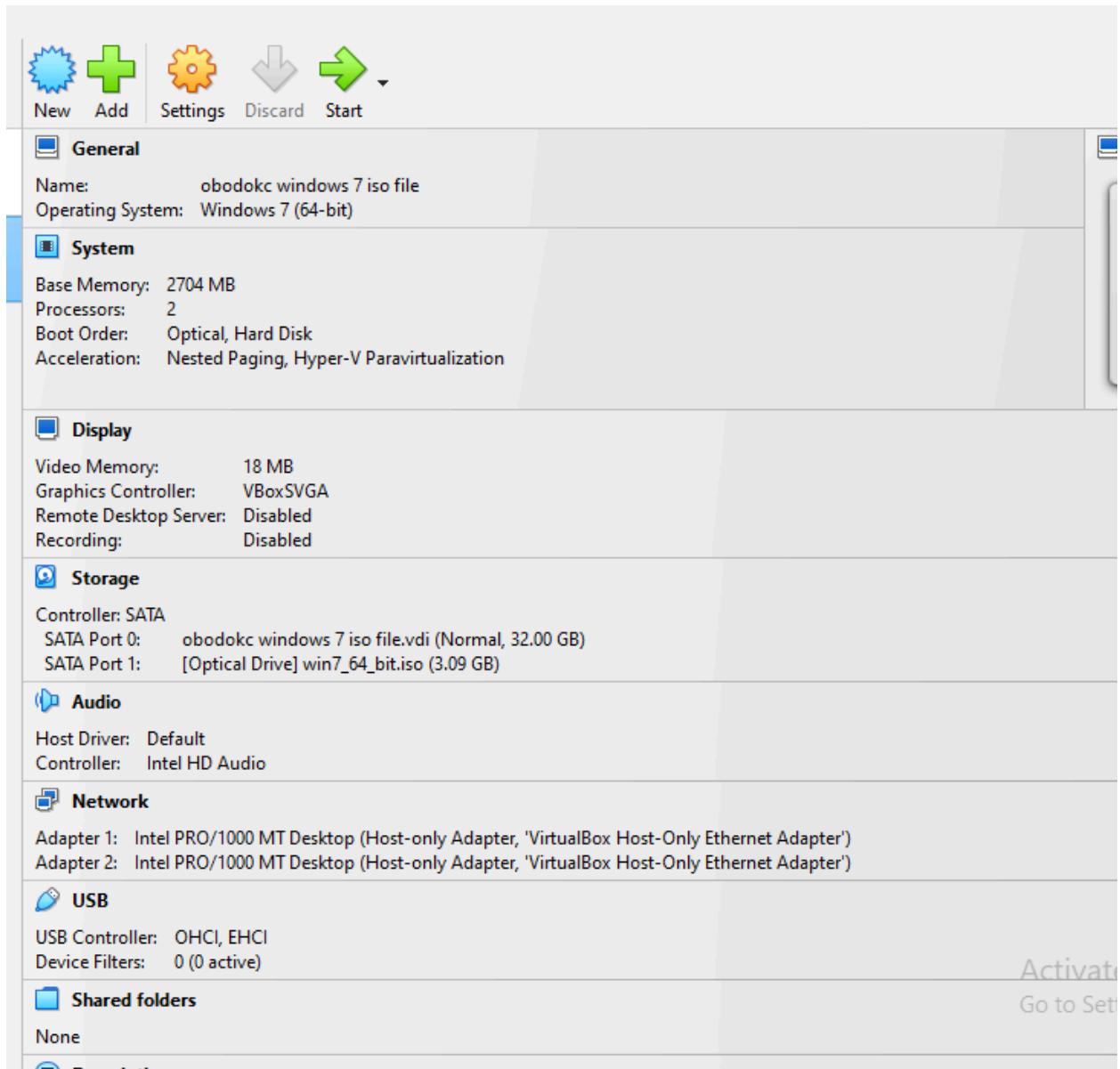
The screenshot shows a Windows File Explorer window with the following details:

- File Explorer Navigation:** Home, Share, View, Compressed Folder Tools.
- Current Location:** This PC > Downloads >
- File List Headers:** Name, Date modified, Type, Size.
- Items in Downloads:**
 - Yesterday (1):** bec_-hushpuppi_complaint.pdf (PDF File, 573 KB)
 - Last week (8):**
 - win7_64_bit.iso (Disc Image File, 3,243,070 KB)
 - MediaCreationTool_22H2.exe (Application, 19,008 KB)
 - kali-linux-2025.2-virtualbox-amd64.7z (WinRAR archive, 3,469,151 KB)
 - Unconfirmed 59984.crdownload (CRDOWNLOAD File, 3,469,151 KB)
 - VirtualBox-7.1.10-169112-Win.exe (Application, 121,530 KB)
 - Unconfirmed 219620.crdownload (CRDOWNLOAD File, 11,385 KB)
 - Oracle_VirtualBox_Extension_Pack-7.1.10... (VirtualBox Extension Pack, 22,434 KB)
 - kali-linux-2025.2-virtualbox-amd64 (File folder)
 - Last month (3):**
 - splunk-9.4.3-237ebbd22314-windows-x6... (Windows Installer File, 816,712 KB)
 - Unconfirmed 970072.crdownload (CRDOWNLOAD File, 816,712 KB)
 - New folder (File folder)
 - Earlier this year (6):**
 - Wireshark-4.4.6-x64.exe (Application, 85,284 KB)
 - android_image.tar (WinRAR archive, 695,376 KB)
 - android_image.tar.gz (WinRAR archive, 386,559 KB)
 - 7z2409-x64.exe (Application, 1,599 KB)
 - autopsy-4.22.1-64bit.msi (Windows Installer File, 1,235,982 KB)
 - nmap-7.97-setup.exe (Application, 34,911 KB)
 - A long time ago (1):** data (File folder)
- Bottom Status Bar:** 11 items, 1 item selected, 377 MB.
- Right Side Buttons:** Activate WiFi, Go to Settings t

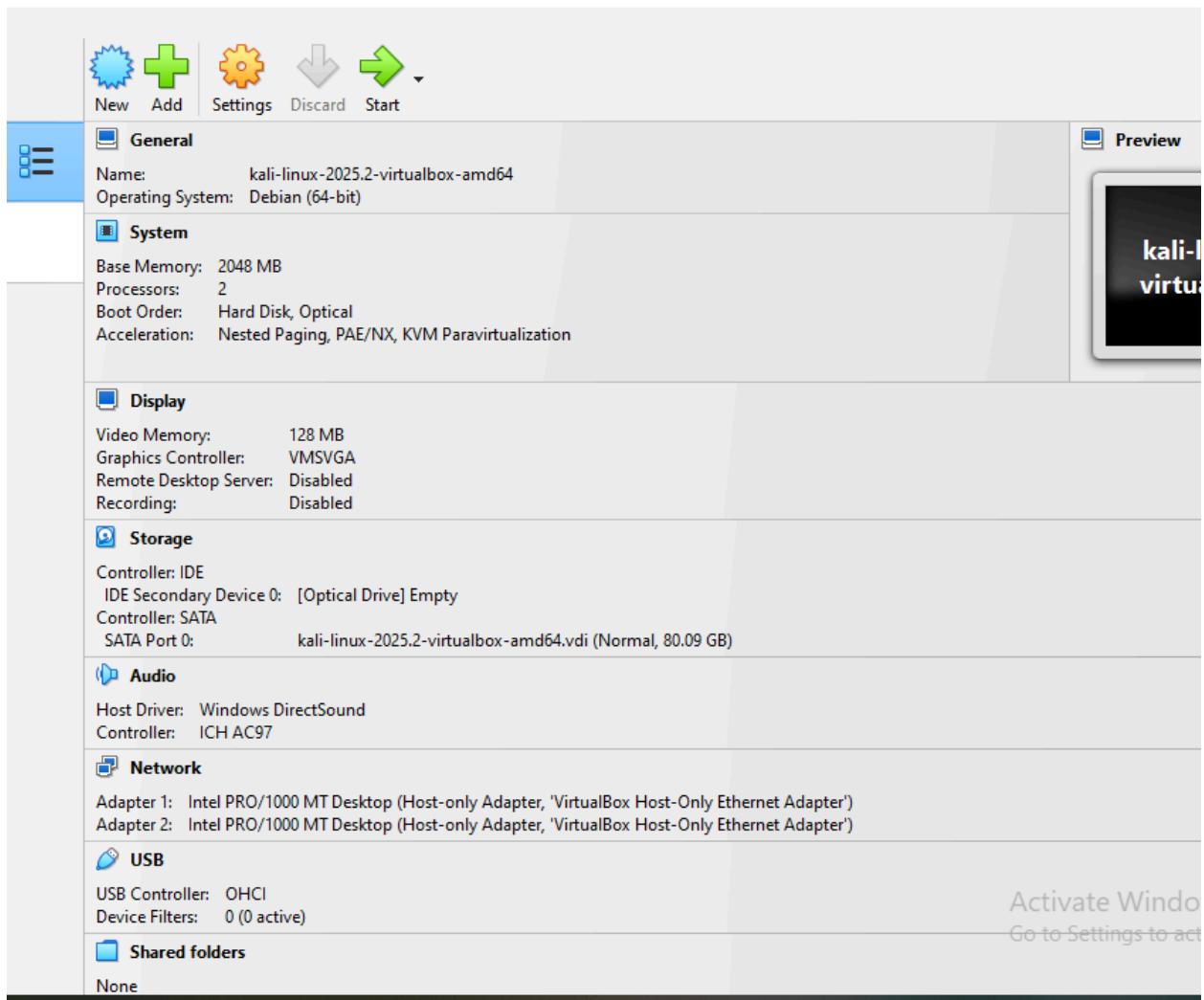
The above is where my two virtual machines are sitting on the host system.



The two virtual machines were extracted or imported into the hypervisor using the 'New' icon on the virtualbox(Kali Linux and Windows 7 ISO). When you hit the new icon it asks you to allocate a name to the machine and then it takes you to the window host where the downloaded VMs are sitting. After then was asked to allocate storage space to the two virtual machines.



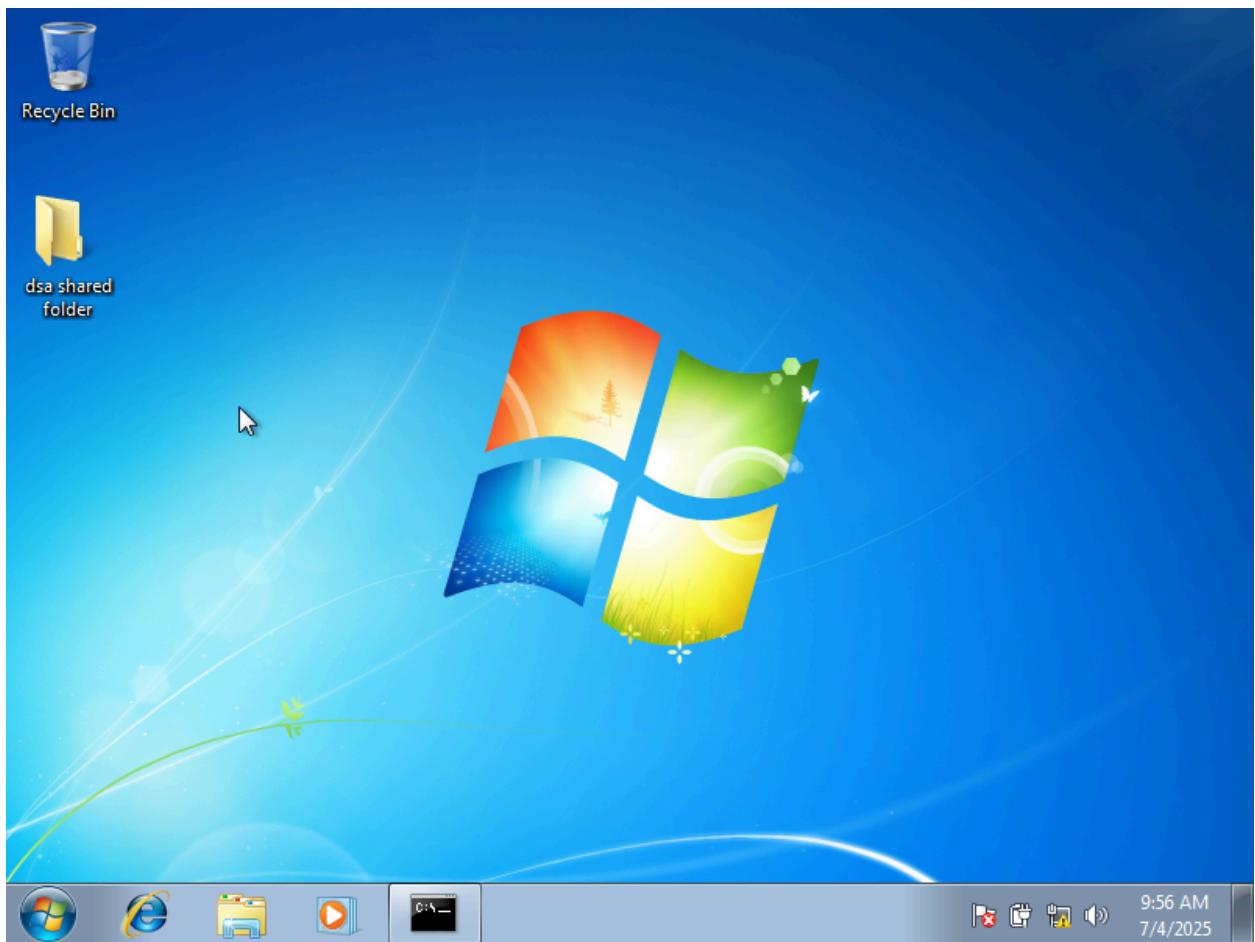
The above shows the storage settings I did for windows iso image while importing from the host system. I also named my windows 7 iso image 'obodokc windows 7 iso file'.



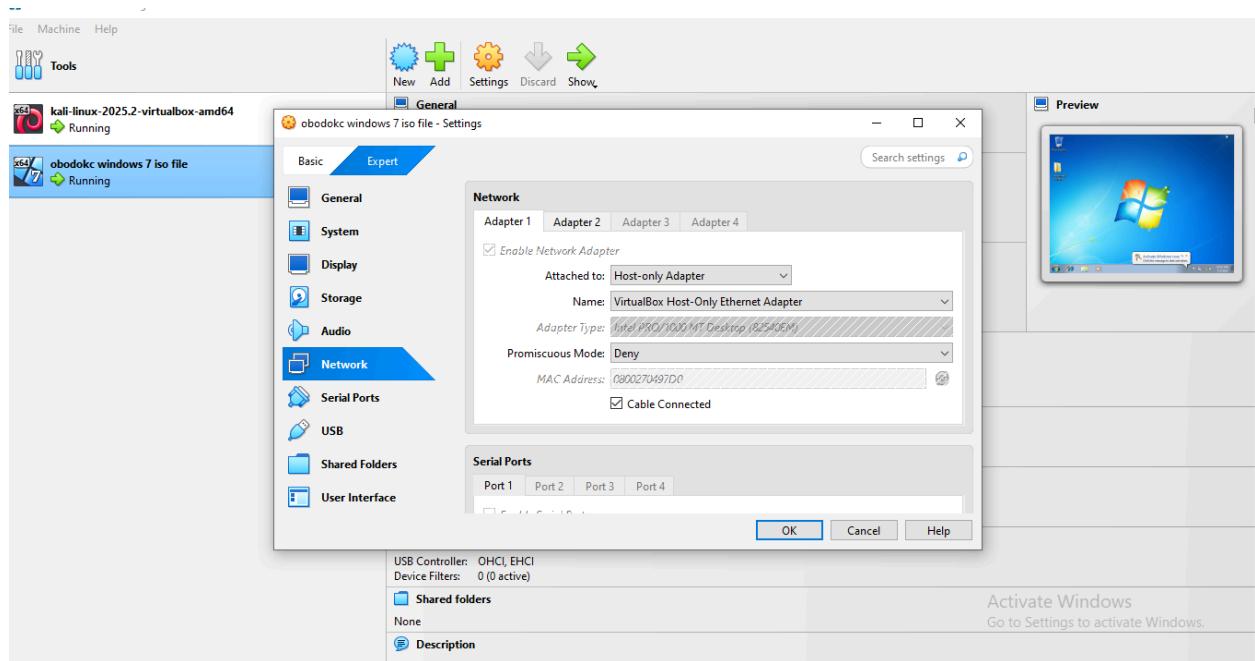
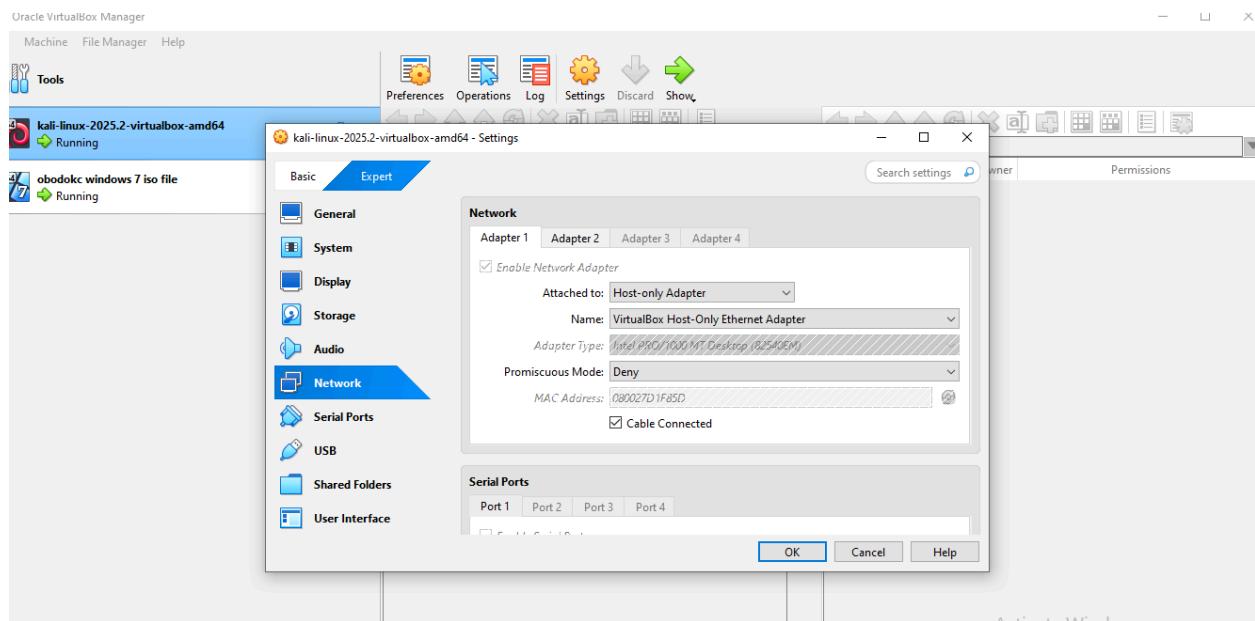
The above is the storage settings I allocated to Kali Linux. Then the installation of the two virtual machines started. When the installation finished the two virtual machines appeared thus:



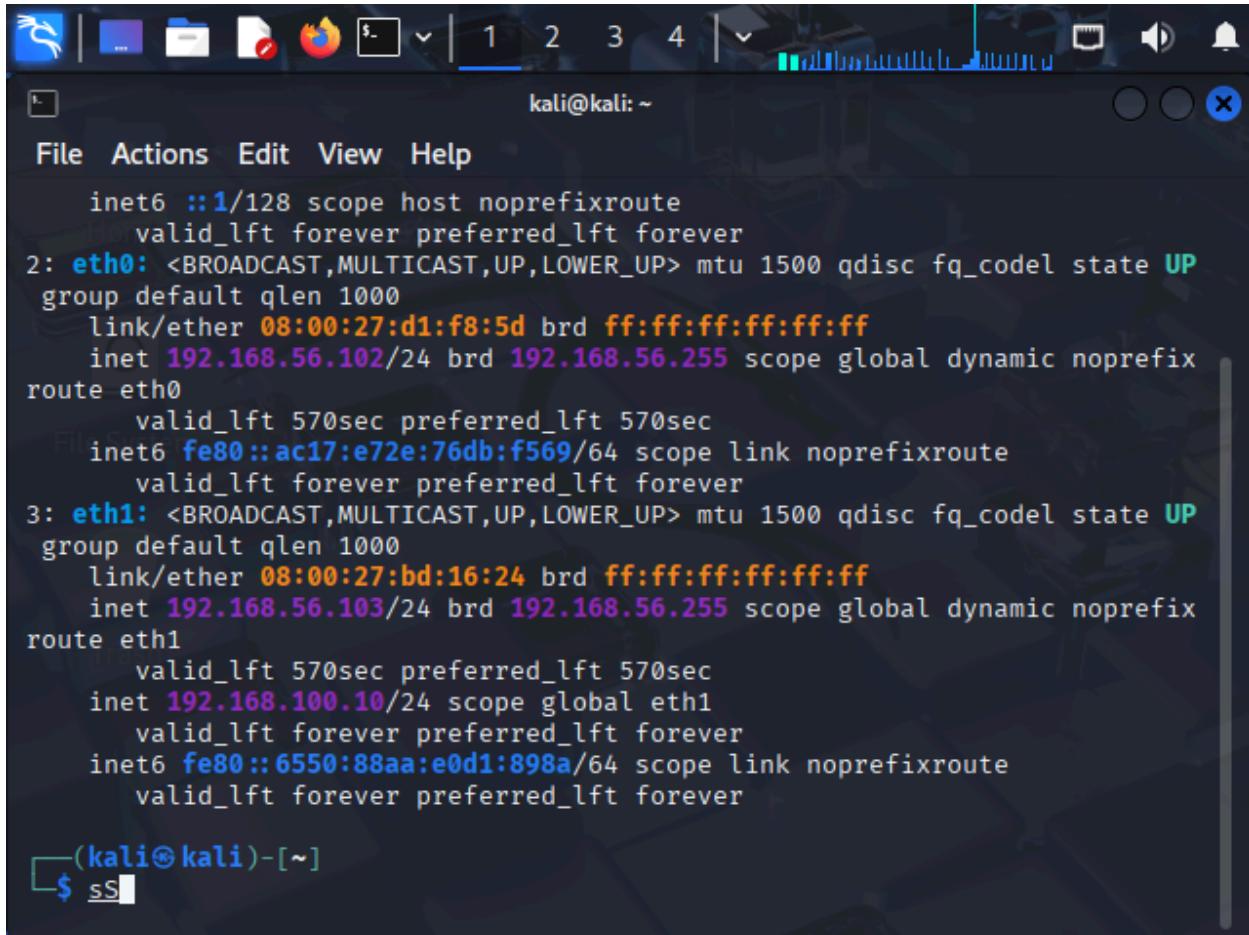
This is Kali Linux installed on the virtualbox



The above screenshot is the Window 7 ISO image. As we can see from the above screenshot, it looks the same as the window 7 that some of us use on our host system. Now for both virtual machines to start communicating with each other. I proceeded to the network settings on the virtualbox. I used host only network adapter for the two Vms.



From virtualbox, I selected the windows 7 iso then I clicked on settings then to network and then to the adapter. I put the adapter 1 and 2 for the two vms on host only adapter. I also did some IP Address settings. I first powered the two vms off before the adapter setting. After the settings, I powered them on again. When the vms came up, i went straight to the windows vm,went to the control panel and then to network sharing center where I assigned IP address, 192.168.100.20(eth2). And then to the Kali Linux virtual machine interface I did sudo ip addr add 192.168.100.10/24 dev eth1, it asked for my Kali password and i entered it, then my Kali Lnx ip address was set. I tested it with ip a' and the information containing the ip address emerged.



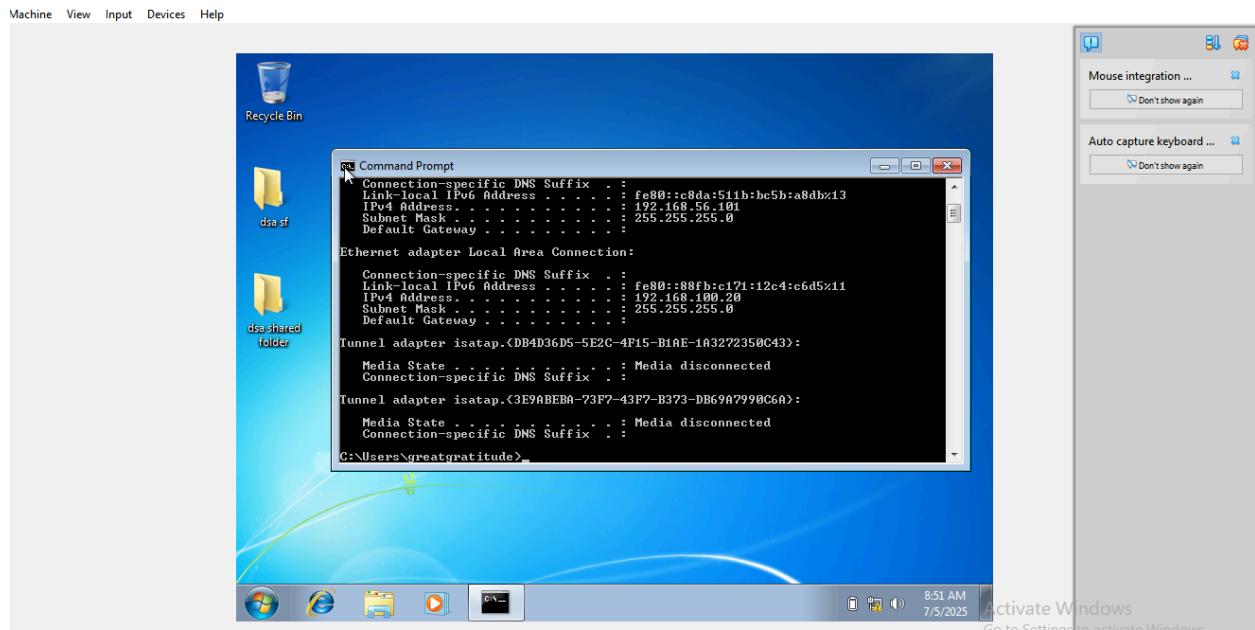
The screenshot shows a terminal window on a Kali Linux desktop environment. The terminal title is "kali@kali: ~". The window contains the output of the command "ip a". The output shows two network interfaces: eth0 and eth1. Interface eth0 is connected to a Windows 7 VM with IP 192.168.56.102. Interface eth1 is connected to the host with IP 192.168.100.10. The terminal prompt at the bottom is "\$ ss".

```
inet6 ::1/128 scope host noprefixroute
      valid_lft forever preferred_lft forever
2: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP
    group default qlen 1000
        link/ether 08:00:27:d1:f8:5d brd ff:ff:ff:ff:ff:ff
        inet 192.168.56.102/24 brd 192.168.56.255 scope global dynamic noprefix
route eth0
    valid_lft 570sec preferred_lft 570sec
    inet6 fe80::ac17:e72e:76db:f569/64 scope link noprefixroute
        valid_lft forever preferred_lft forever
3: eth1: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP
    group default qlen 1000
        link/ether 08:00:27:bd:16:24 brd ff:ff:ff:ff:ff:ff
        inet 192.168.56.103/24 brd 192.168.56.255 scope global dynamic noprefix
route eth1
    valid_lft 570sec preferred_lft 570sec
    inet6 fe80::6550:88aa:e0d1:898a/64 scope link noprefixroute
        valid_lft forever preferred_lft forever

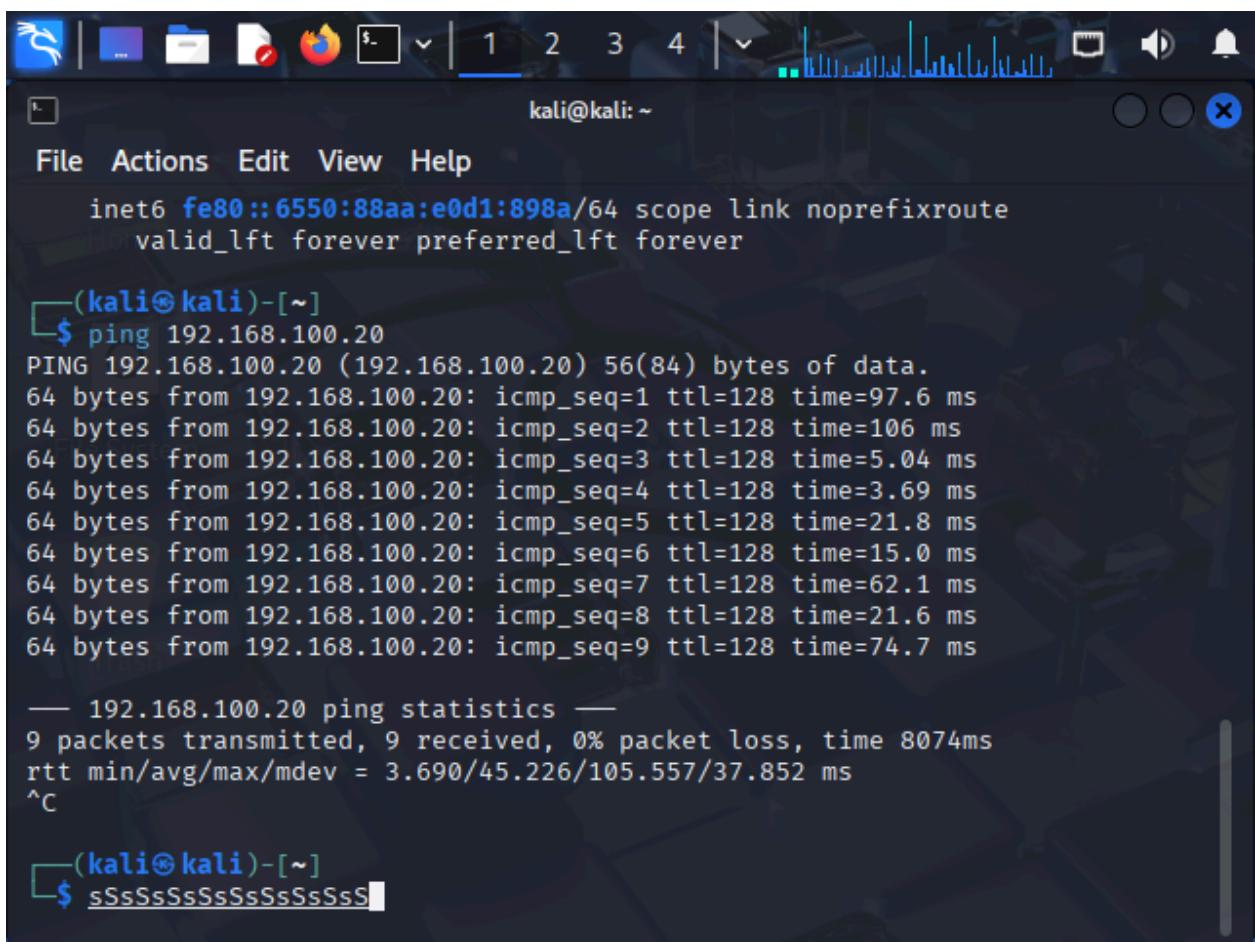
└─(kali㉿kali)-[~]
$ ss
```

The screenshot below explains further:

I also tested the windows 7 iso through the command prompt using the command 'ipconfig' and I saw the ip address I assigned to the windows 7 iso(192.168.100.20).



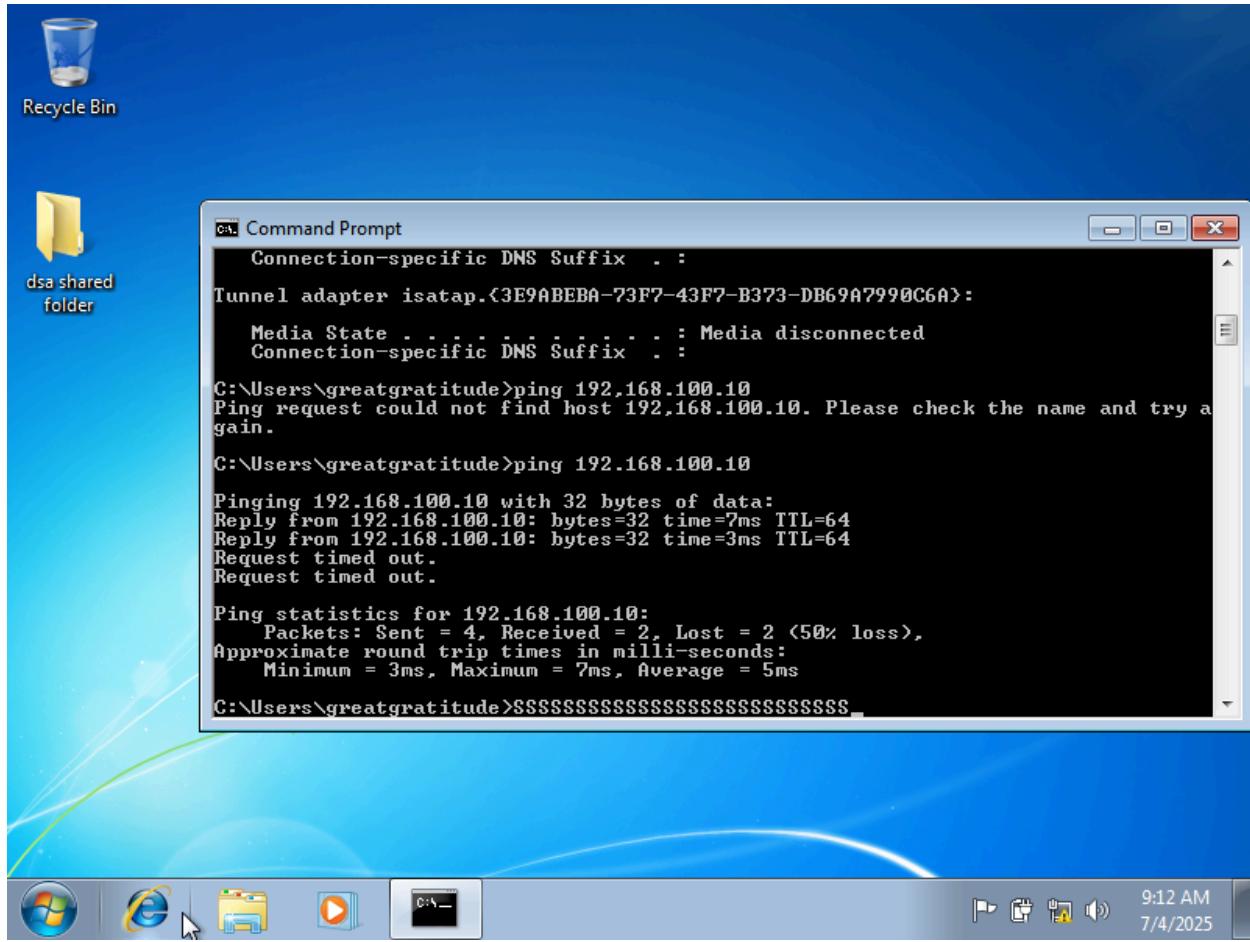
Then I started the ping communication to be sure they are communicating. I did ping 192.168.100.20 on the kali interface and it did communicate well with the windows 7 iso.



The screenshot shows a terminal window in Kali Linux. The terminal title is "kali@kali: ~". The window contains the following text:

```
inet6 fe80::6550:88aa:e0d1:898a/64 scope link noprefixroute  
valid_lft forever preferred_lft forever  
  
└─(kali㉿kali)-[~]  
└─$ ping 192.168.100.20  
PING 192.168.100.20 (192.168.100.20) 56(84) bytes of data.  
64 bytes from 192.168.100.20: icmp_seq=1 ttl=128 time=97.6 ms  
64 bytes from 192.168.100.20: icmp_seq=2 ttl=128 time=106 ms  
64 bytes from 192.168.100.20: icmp_seq=3 ttl=128 time=5.04 ms  
64 bytes from 192.168.100.20: icmp_seq=4 ttl=128 time=3.69 ms  
64 bytes from 192.168.100.20: icmp_seq=5 ttl=128 time=21.8 ms  
64 bytes from 192.168.100.20: icmp_seq=6 ttl=128 time=15.0 ms  
64 bytes from 192.168.100.20: icmp_seq=7 ttl=128 time=62.1 ms  
64 bytes from 192.168.100.20: icmp_seq=8 ttl=128 time=21.6 ms  
64 bytes from 192.168.100.20: icmp_seq=9 ttl=128 time=74.7 ms  
  
— 192.168.100.20 ping statistics —  
9 packets transmitted, 9 received, 0% packet loss, time 8074ms  
rtt min/avg/max/mdev = 3.690/45.226/105.557/37.852 ms  
^C  
  
└─(kali㉿kali)-[~]  
└─$ sSsSsSsSsSsSsSsSsSs
```

That was kali linux communicating with windows 7 iso. With 9 packets being transmitted.

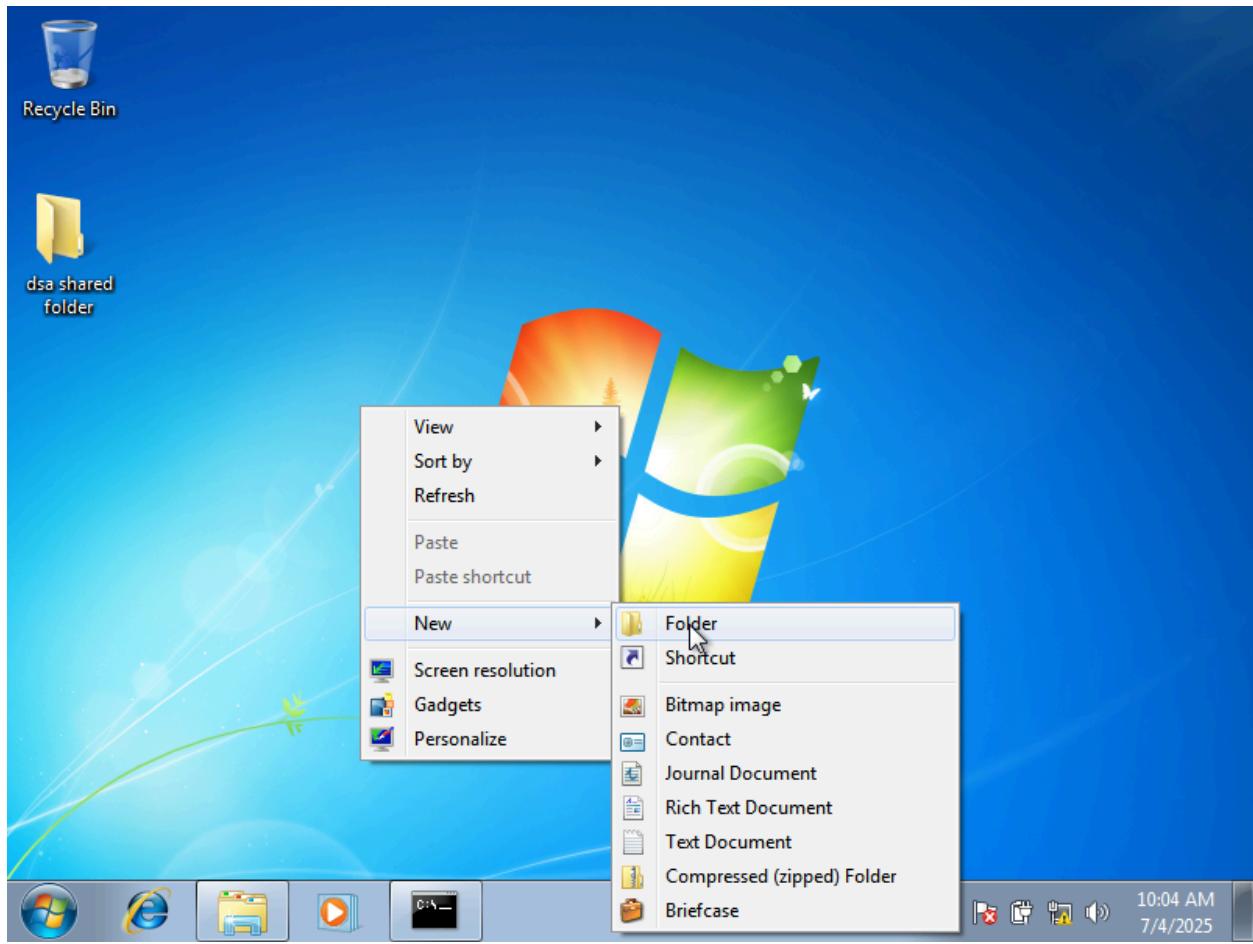


The above was window 7 virtual machine communicating with kali linux through the ping service command, ping 192.168.100.10.

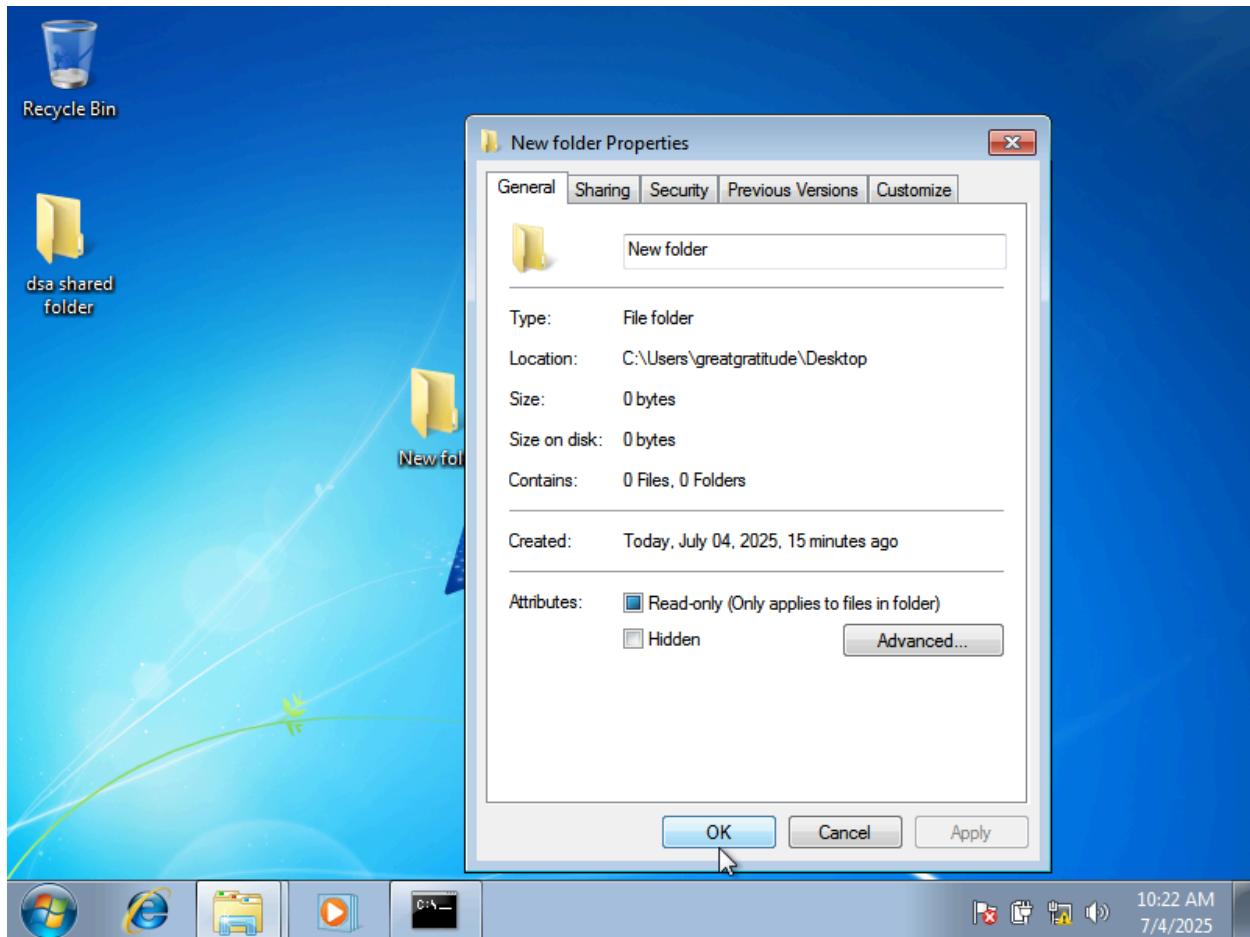
Then I did service enumeration using nmap command on the kali linux interface and it responded well. I scanned the window 7 iso ip address on kali linus interface using nmap command.

From the above screenshot I scanned the ip address of the window 7 vm with, nmap -sS 192.168.100.20 and i discovered that port 139, 2869 and 5357 of the window 7 vm are open with some services running on them.

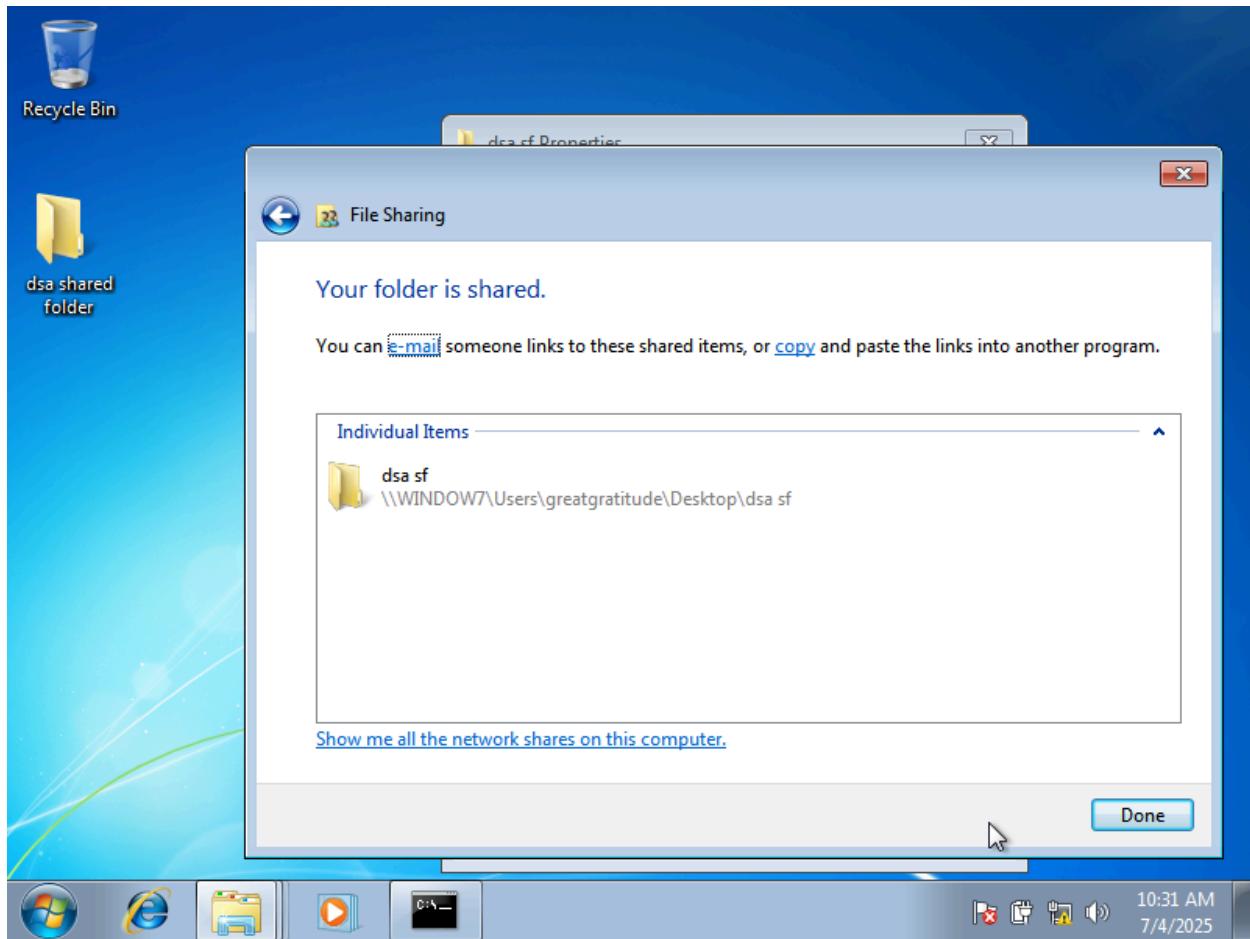
To establish a shared directory between the two virtual machines, I opened a new folder on my window 7 virtual machine, after then i right clicked the file and clicked on properties. And then i navigated to file sharing and granted permission for the sharing.



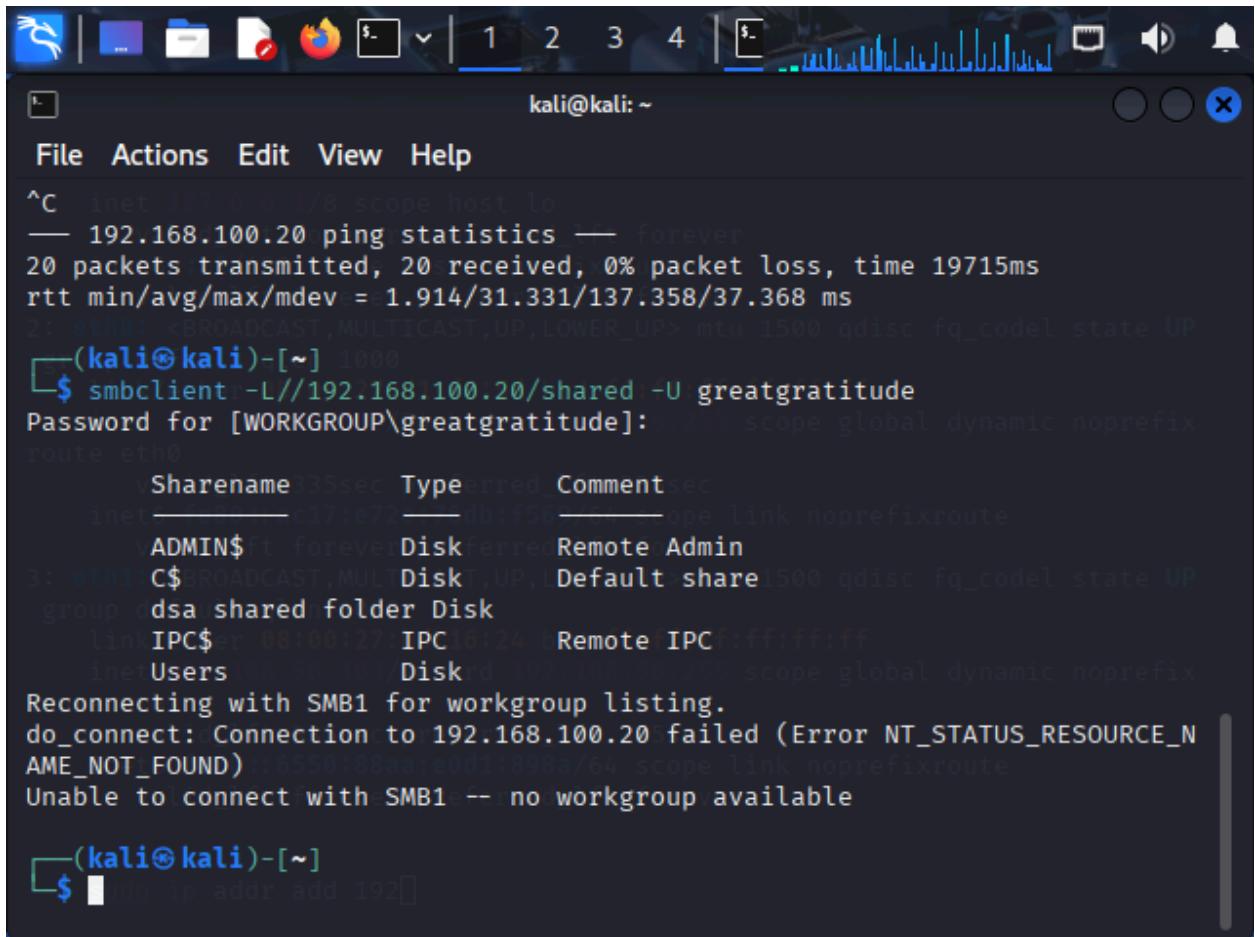
The screenshot below explains further:



Here, after selecting file sharing, i selected everyone in the box and clicked on add. After that everyone appeared in the permission box and a clicked on share and that was all.



Then I went straight to kali linux interface and typed smbclient -L//192.168.100.20/shared -U greatgratitude and i hit enter. It requested for my window 7 vm password, as i entered it, the result came out.



A screenshot of a Kali Linux terminal window. The terminal shows the output of an SMB client command. The user has connected to a share named 'greatgratitude' located at '192.168.100.20/shared'. They are prompted for a password, which they enter. The terminal then lists available shares on the remote machine, including 'ADMIN\$', 'C\$', and 'IPC\$'. It also shows network interface information and a warning about reconnecting with SMB1. Finally, the user runs the command 'ip addr add 192'.

```
kali@kali: ~
File Actions Edit View Help
^C  inet 192.168.100.20/8 scope host lo
    -- 192.168.100.20 ping statistics 16 forever
    20 packets transmitted, 20 received, 0% packet loss, time 19715ms
    rtt min/avg/max/mdev = 1.914/31.331/137.358/37.368 ms
3: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP
    (kali㉿kali)-[~] 1000
    $ smbclient -L//192.168.100.20/shared -Ugreatgratitude
    Password for [WORKGROUP\greatgratitude]: 
    Sharename 335sec Type Comment sec
    inet 192.168.100.20/24 brd 192.168.100.255 scope link noprefixroute
        ADMIN$ ft forever Disk Ferred Remote Admin
3: eth1: C$ <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP
    group dsa shared folder Disk
    link IPC$ brd 08:00:27:16:24:b Remote IPCffff:ff
    inet Users 192.168.100.20/24 brd 192.168.100.255 scope global dynamic noprefixroute
    Reconnecting with SMB1 for workgroup listing.
do_connect: Connection to 192.168.100.20 failed (Error NT_STATUS_RESOURCE_NAME_NOT_FOUND) 16550188aa:0e0d11898a/64 scope link noprefixroute
Unable to connect with SMB1 -- no workgroup available

    (kali㉿kali)-[~]
    $ ip addr add 192
```

From the above screenshot, the name of the folder I created(dsa shared folder) appeared in the result. This shows that we can conveniently move our folder or file from any of the virtual machine to the other.