Lab Environment setup

6COSC019W

University Of Westminster

PLEASE READ THIS SECTION CAREFULLY

- **On your own device**: You will need to complete this lab only once.
- **In class (Lab devices)**: Check the weekly lab to decide which VMs you need
- In **some labs**, you need your Kali Linux VM to be connected to the **Internet**.
- **The only machine that you possibly need to connect to the Internet is Kali machine, to install some applications or to update your machine.**
  1. **KALI LINUX**
  2. **OWASP VULNERABLE MACHINE**
  3. **WINDOWS Machine**
- **If you are having a problem, check the last section of this document (Problems you can face). If this is still not working, please check with your lab instructor.**

Lab environment

How to download

1. For this course we will be using three different virtual machines.
   (1) The **first** VM will be the attacher machine that contains. This will be a "Kali Linux machine".
   (2) The **second** VM will be the vulnerable machine that contains all the different services (Apache, databases,web apps, etc..).
   (3) The **third** VM will be the victim machine. This is a windows 7 virtual machine.. **Download IE8 on Win7**. The platform depends on which Virtual machine software you are using.
- To download them, please choose from below:
2. **If you are working from home:**
   - **Access from the ECS download page**
     – https://download.ecs.westminster.ac.uk/VirtualMachines/
3. **If you are using a university machine in the lab:**

- Open the web browser, navigate to the address relevant to your class location:
  - **For CLG.43**
    http://192.168.143.203/download
  - **For CLG.45**
    http://192.168.145.206/download
  - **internal, eduroam or CLG.42**
    http://10.20.144.78/download/VMs/SecurityVMs/
- **If you are your own machine and**
  - **You are connected to Eduroam:**
    http://10.20.144.78/download/VMs/SecurityVMs/
- Download the relevant VMs by right clicking save as and place in C\:VirtualMachines
- Check in C:\:VirtualMachines for the downloads, they may already be there. Kali should be in the folder on all the CLG.42 PCs (except PC7 that's broken)

- You will also need a virtual machines manager application. There are many choices of Virtualization software you can use.
- For this module we will be using Oracle Virtual box. You can download Oracle Virtual box from this link.
  - You can also download VirtualBox from the university ECS support page
    https://support.ecs.westminster.ac.uk/w/index.php/Software:_VirtualBox
  - You need to make sure you are downloading the correct version - **depending on your host Operating system**
  - Once the download is finished, you should install it.
- Now we have VirtualBox up and we also have all our VMs will then need to import the three VMs you have downloaded. You can import in Virtual box by either double clicking on your downloaded file directly and following instructions or by clicking on import to locate the file and import to virtual box.
- Now that you have all the machines needed, you need to create them. When you create the VM, create it in C:\:VirtualMachines. To do this, click the location and set Other on the Import menu as shown in Fig.2 below.

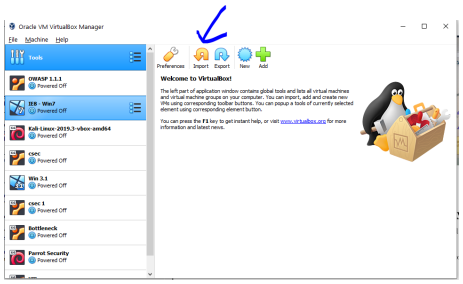

Figure 1: Import VMs into virtualbox

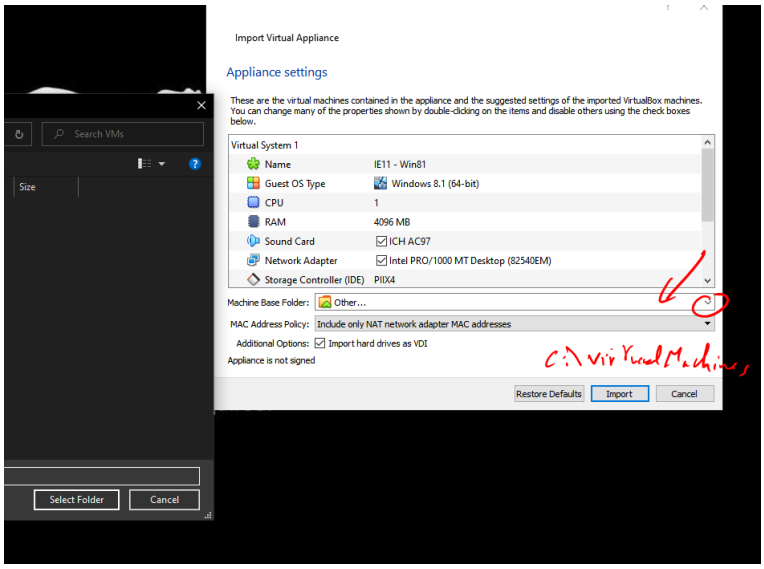

Figure 2: Save as and place in C:\:VirtualMachines

Virtual machines setup

1. Kali Linux (Kali-linux-2022.3-UoW-vitualbox-amd64)
    - username: kali
    - password: kali
2. Owaspbwa linux (OWASP Broken Web Apps VM 1.2)
    - username: root
    - password: owaspbwa
3. Windows 7 (When needed - IE8-Win7)
    - username: admin
    - password: Passw0rd!

Network Setup

Internet Connected VM

Internet Connected Network

- In some times, you need your Kali Linux VM to be connected to the Internet.
- You never need to connect the Win7 machine or the OWASP machine to the Internet

The steps below will be the same for any VMs that you want it to be connected to the Internet (to the network your host machine is connected to)

- Select the VM you need to change settings for and click on Settings. (Fig.3)
- Select Network (Fig4)
- Choose in the drop down menu of **Attached to** the option NAT. This is network Address Translation. This will give your virtual machine access to the network resources of your host machine. It will use the same IP address of your host machine to connect to the Internet. (Fig4)

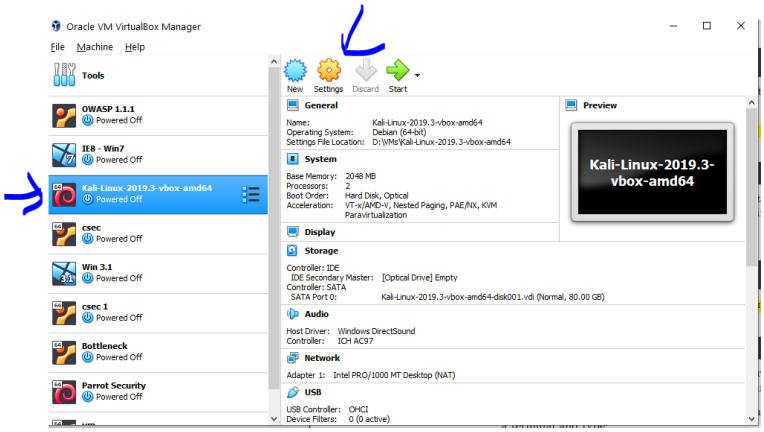

Figure 3: Choose Settings

Isolated Network

Internet Connected Network

- Most of the labs will need this network setup unless the lab specifies otherwise

- There are two methods to configure your lab network environment. We will look at both and how you can set up your network to use any of them.
- For both you will need to first create a Virtual network by following the steps below.
  - Click on File on the Virtual box program and select **Host Network Manager** Fig.5
  - Click on Create Fig.6

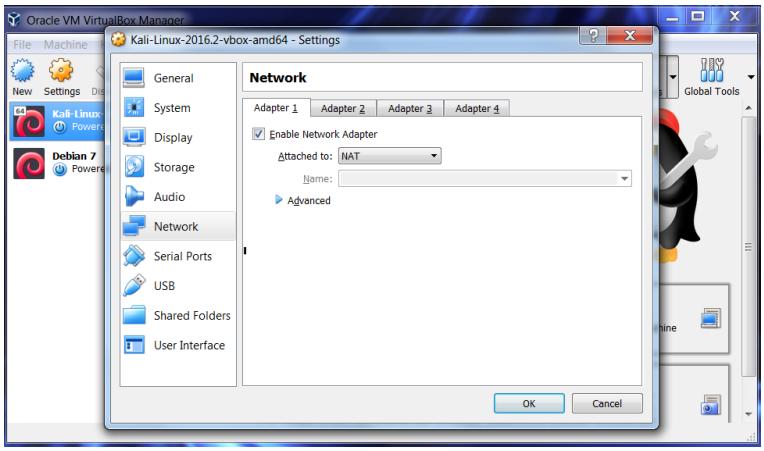

Figure 4: Choose NAT

1. If you want to setup your network IP addresses manually for each machine then make sure DHCP is not enabled as in Fig.6

- Now you need to make sure that your VM network settings uses the virtual Network you created.
  - Click on Settings as in Fig.5
  - Click on Create network as in Fig.6
  - Click on properties after enabling DHCP and select DHCP server. The settings in n (Fig.8) is what I am using for the labs. This will give the first IP 101 to KAli.
  - click on Network as in (Fig.9) and choose **Host Only Adapter**. You should see the Network Name as **Virtual Box host-only adapter.**

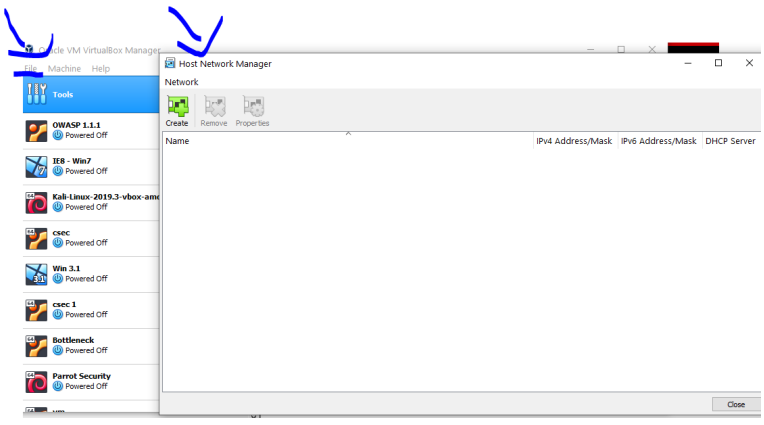

Figure 5: Enter into Host Network manager Setup window

- To check your ip address, in any of those virtual machine devices you open a terminal and type:
  - **ifconfig**
- In Windows you can open a command line Interface by clicking on start and typing cmd.
  - **ipconfig**
- **The step shown in Fig.9 needs to be repeated for all the VMs to ensure that all of them are on the same network.**

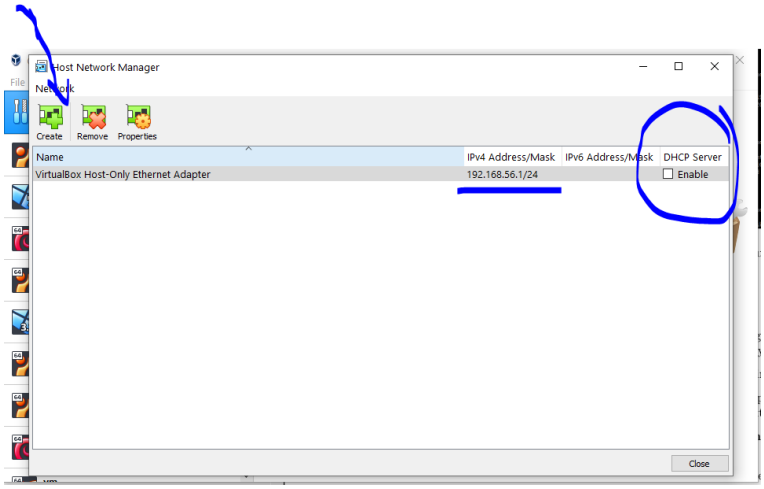

Figure 6: Create Network

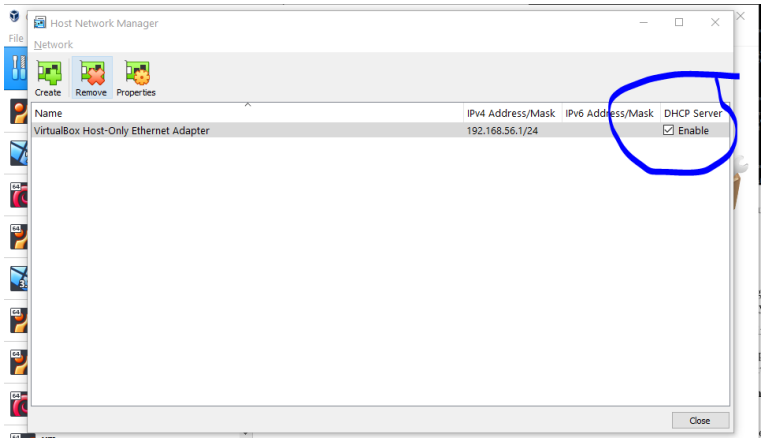

Figure 7: Enable DHCP

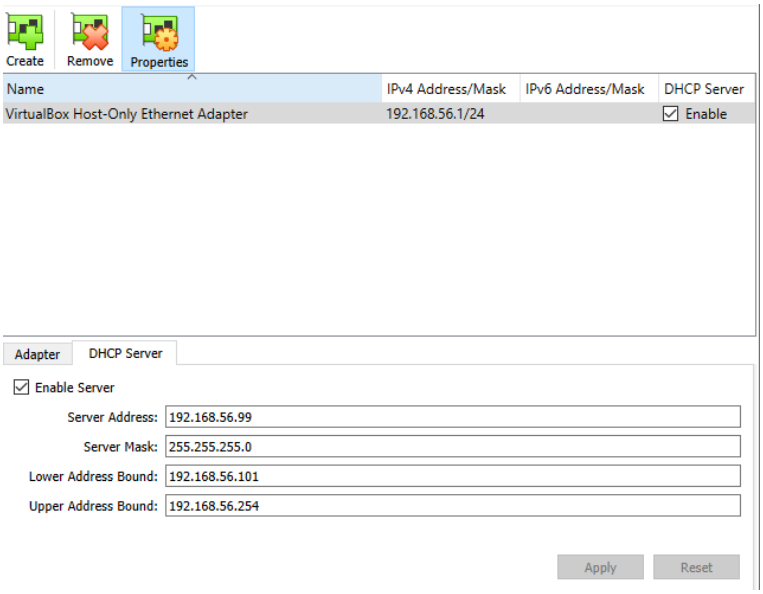

Figure 8: DHCP settings

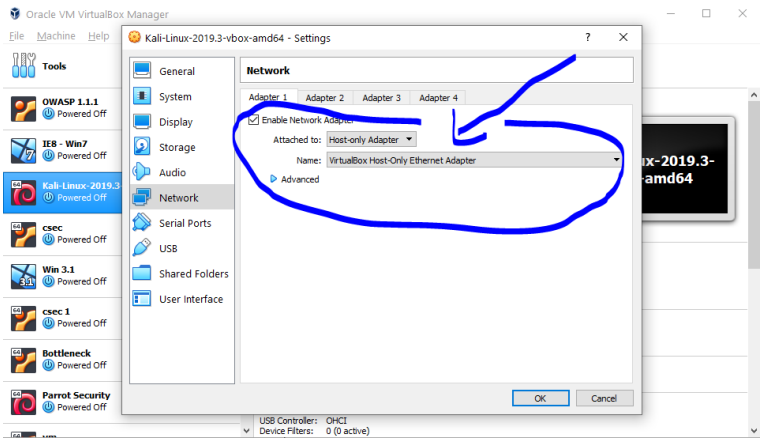

Figure 9: Host Only Adapter Settings

1 Test connectivity

- You can test connectivity between machines on the terminal by using **ping** command.
- **Note:** You will need to check your IP addresses before you do this step. Your VMs IP addresses might be different then the one in the examples below.
- To identify your IP address on a:
  1. **Linux machine:** open a terminal and type **ifconfig** or type **ip address**
  2. **Windows machine:** open the command line and type **ipconfig**
- To check connectivity between devices:
  - To ping the vulnerable machine from kali **ping 192.168.56.102**
  - To ping the kali machine from the vulnerable machine **ping 192.168.56.101**
  - To ping the windows machine from the kali machine **ping 192.168.56.103**
    - If the ping to windows does not work, disable the firewall on windows control panel.
- when we selected host only network we created a private network between our VMs that is completely isolated from the external world.
- Your host machine also have a virtual Box interface that connects your device to the private network.

Update Kali Linux

For our labs, we will need a browser attachment called **owasp mantra**

- Kali linux needs to be on the internet (NAT). Check (Fig4). You will only need to connect KALI VM to the internet.
- THE OTHER MACHINES SHOULD NOT BE CONNECTED TO THE INTERNET
- **Update repositories for Linux** by typing
  - sudo apt-get update

Problems that you can possibly face

We faced some problems in the class. I want to avoid having those problems every week as it will take away from our lab time.

1. on Vbox, you need to create a virtual box network interface first
2. On Kali Linux, changes you made in your network interface were not taking effects until the network manager service was restarted by using **sudo service network-manager restart**
3. In some machines, you need to change the USB setting for the VM to USB 1.1 as shown in fig below. This applies for any machines that throw the USB error.

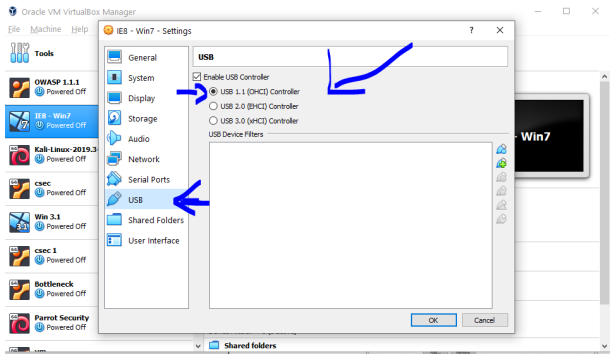

Figure 10: USB error

DHCP not assigning a Host Only adapter

- Sometimes, you create a Host only adapter network and DHCP is enabled and you notice your VM machines are not getting an IP address in the host only adapter network
- This is more relevant to CLG.45 lab.
- If this happens, on the Windows machine, go to "control panel" and choose Network sharing and Center as shown in Fig.11
- Choose "Change adapter Settings" as shown in Fig.12
- Find the Network interface labelled "Virtual Box"
- Right click on it and disable it.
- Right click on it and enable it again.

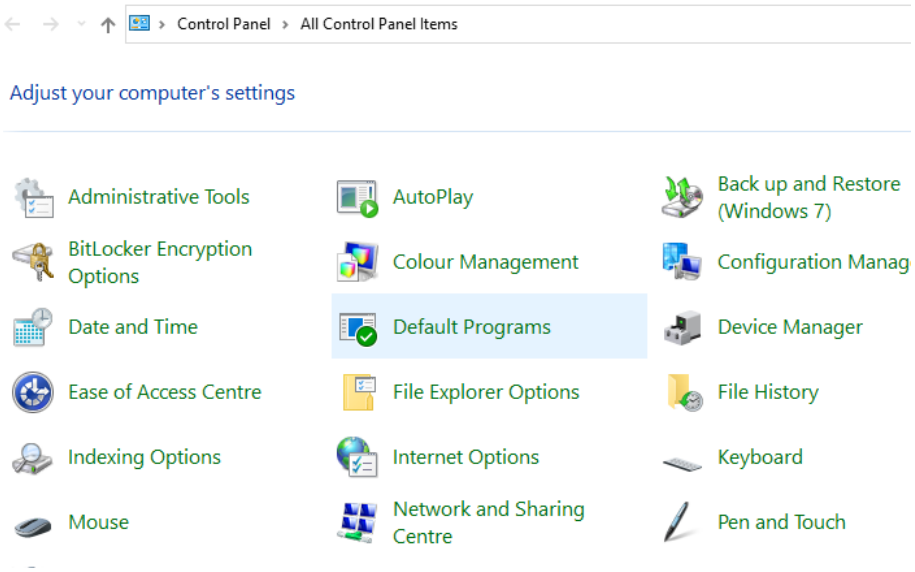

Figure 11: control panel

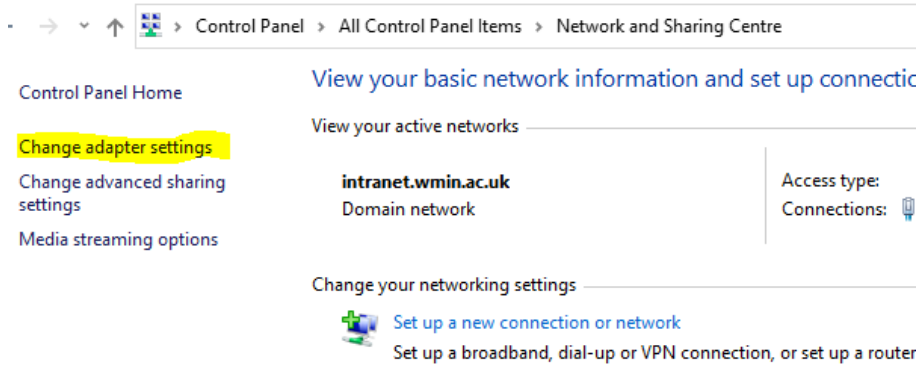

Figure 12: Change adapter Settings