

## Ethical hacking of a CTF-VM

Laboratory protocol Exercise 7: Ethical hacking of a CTF-VM



Figure 1: Grouplogo

Subject: ITSI Class: 3AHITN

Name: Stefan Fürst, Justin Tremurici Groupname/number Name here/12

Supervisor: SPAC, ZIVK

Exercise dates: Submission date:



## Contents

| 1 | Task definition  | 3   |
|---|--|---|
| 2 | Summary  | 3   |
| 3 | Complete network topology of the exercise  | 4   |
| 4 | Exercise Execution 4.1 Setting up the virtual machines. 4.2 Reconnaissance: Scanning the Network 4.3 exploring the websites 4.4 breaking the http authtication 4.5 sshing into the server 4.6 exploring the system 4.7 proces flag 4.8 comment flag 4.9 sudo flag 4.10 history flag 4.11 tmp flag 4.12 it's over but actually not 4.13 trying to escalate privaledgs 4.13.1 smart enumeration 4.13.2 trying a kernel level exploit 4.13.3 checking suid binarys 4.13.4 checking root proceses 4.13.5 trying metasploit 4.13.6 trying other common ctf priv escalation ways 4.14 reseting the root password and exploring the vm 4.15 7 flags | 77<br>88<br>88<br>88<br>88<br>88<br>88<br>88<br>88<br>88<br>88<br>88<br>88<br>8 |
|   | 4.16 talking abt the setup etc or sum idk :shruge:   |   |
| 5 | References   | 9   |
| 6 | List of figures  | 10  |

htl donaustadt Donaustadtstraße 45 1220 Wien

Abteilung: Informationstechnologie Schwerpunkt: Netzwerktechnik



## 1 Task definition

2 Summary



# 3 Complete network topology of the exercise

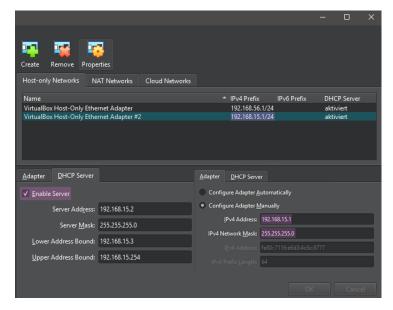


Figure 2: Complete network topology of the exercise



#### 4 Exercise Execution

#### 4.1 Setting up the virtual machines.

To get started with this CTF, make sure that VirtualBox version 7.1.4 is used. The VM to attack must be imported by double-clicking the provided .ova file. After the import is complete, the network settings must be changed to use Host-only Adapter mode. Since using the default Host-only network did not work, we had to create a new Host-only network. To do this, either press <C-h> or click on File > Tools > Network Manager, as shown in Figure 3.

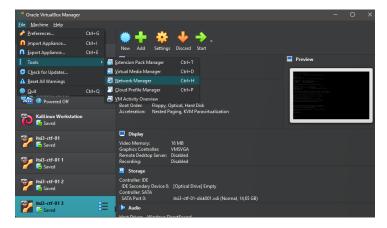


Figure 3: Opening VirtualBox Network Manager settings

In this menu, click on Create, then check the Enable Server box to enable the DHCP server so the target VM will receive an IP address. Then, click on Adapter to view the IP range of the network, which in our case is 192.168.15.0/24, which can be seen in Figure 4.

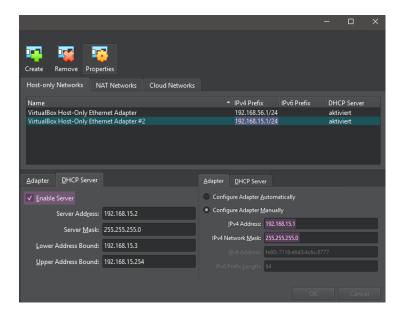


Figure 4: Showing the IP settings for the new Host-only network

Next, open the virtual machine settings by selecting the VM in the list and pressing <C-s>. Under the Network section, change the network adapter to use the Host-only Adapter and select the VirtualBox Host-only Ethernet Adapter #2, which was just created. Perform this step for both the target VM and the Kali VM, as detailed in Figure 5.



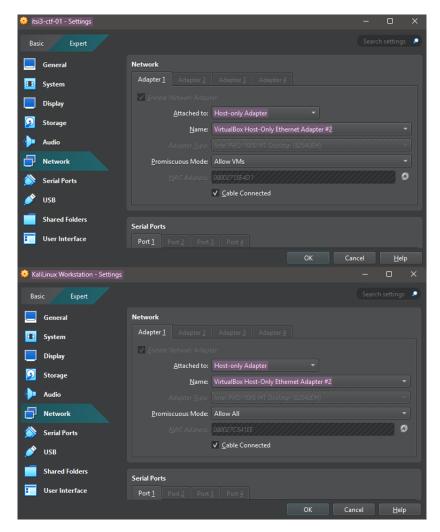


Figure 5: Showing the network configuration of the virtual machines



#### 4.2 Reconnaissance: Scanning the Network

Any attack starts with reconnaissance, which in this case means scanning the network with nmap. Since we don't know the IP address of the target server yet, we need to scan the network to find it. For this, the command nmap 192.168.15.0/24 is used to scan the entire network for open ports, as illustrated in Figure 6.

```
Starting Nmap 7.91 (https://mmap.org ) at 2025-01-17 17:56 CET mass_dns: warning: Unable to determine any DNS servers. Reverse DNS is disa bled. Try using —system-dns or specify valid servers with —dns-servers Nmap scan report for 192.168.15.1
Host is up (0.0010s latency).
All 1000 scanned ports on 192.168.15.1 are filtered MAC Address: 0A:00:27:00:00:2F (Unknown)

Nmap scan report for 192.168.15.2
Host is up (0.00025s latency).
All 1000 scanned ports on 192.168.15.2 are filtered MAC Address: 08:00:27:9D:4C:27 (Oracle VirtualBox virtual NIC)

Nmap scan report for 192.168.15.3
Host is up (0.00049s latency).
Not shown: 998 closed ports
PORT STATE SERVICE 22/tcp open socks
NAC Address: 08:00:27:15:E4:D1 (Oracle VirtualBox virtual NIC)
Nmap scan report for 192.168.15.4
Host is up (0.000020s latency).
Not shown: 999 closed ports
PORT STATE SERVICE 111/tcp open rpcbind
Nmap done: 256 IP addresses (4 hosts up) scanned in 5.92 seconds
```

Figure 6: Results of the nmap scan

We can determine that the target has the IP address 192.168.15.3, since, as seen in Figure 4, .1 is the network address, .2 is the DHCP server, and .4 is the IP address of the Kali VM. This can be verified by running ip a or by scanning the open ports, since ssh is not exposed. Now we can run another nmap scan to get fruther information abt the running servives and their version by using the sV flag and use the T4 flag which sets the timing to agressive with the value 4 and the p falg with - value to scan all ports. [?]



- 4.3 exploring the websites
- 4.4 breaking the http authtication
- 4.5 sshing into the server
- 4.6 exploring the system
- 4.7 process flag
- 4.8 comment flag
- 4.9 sudo flag
- 4.10 history flag
- 4.11 tmp flag
- 4.12 it's over but actually not
- 4.13 trying to escalate privaledgs
- 4.13.1 smart enumeration
- 4.13.2 trying a kernel level exploit
- 4.13.3 checking suid binarys
- 4.13.4 checking root process
- 4.13.5 trying metasploit
- 4.13.6 trying other common ctf priv escalation ways
- 4.14 reseting the root password and exploring the vm
- 4.15 7 flags
- 4.16 talking abt the setup etc or sum idk :shruge:



## 5 References

## References



# 6 List of figures

# List of Figures

| 1 | Grouplogo   | 1 |
|---|---|---|
| 2 | Complete network topology of the exercise                 | 4 |
| 3 | Opening VirtualBox Network Manager settings               | 5 |
| 4 | Showing the IP settings for the new Host-only network     | 5 |
| 5 | Showing the network configuration of the virtual machines | 6 |
| 6 | Results of the nmap scan                                  | 7 |