Class 10 - 05/09/2023

Nmap Cheat Sheet

comparitech

Different usage options
Port discovery and specification
Host discovery and specification
Vulnerability scanning
Application and service version detection
Software version detection against the ports
Firewall / IDS Spoofing

Port Specification Options

Syntax	Example	Description
-P	nmap -p 23 172.16.1.1	Port scanning port specific port
-P	nmap -p 23-100 172.16.1.1	Port scanning port specific port range
-p	nmap -pU:110,T:23-25,443 172.16.1.1	U-UDP,T-TCP different port types scan
-p-	nmap -p- 172.16.1.1	Port scan for all ports
-p	nmap -smtp,https 172.16.1.1	Port scan from specified protocols
-F	nmap -F 172.16.1.1	Fast port scan for speed up
-P "*"	namp -p "*" ftp 172.16.1.1	Port scan using name
-r	nmap -r 172.16.1.1	Sequential port scan

Scanning Types

Switch/Syntax	Example	Description
-sS	nmap 172.16.1.1 -sS	TCP SYN port scan
-sT	nmap 172.16.1.1 -sT	TCP connect port scan
-sA	nmap 172.16.1.1 -sA	TCP ACK port scan
-sU	nmap 172.16.1.1 -sU	UDP port scan
-Sf	nmap -Sf 172.16.1.1	TCP FIN scan
-sX	nmap -SX 172.16.1.1	XMAS scan
-Sp	nmap -Sp 172.16.1.1	Ping scan
-sU	nmap -Su 172.16.1.1	UDP scan
-sA	nmap -Sa 172.16.1.1	TCP ACK scan
-SL	nmap -Sl 172.16.1.1	list scan

Host /172.16.1.1 Discovery

Switch/Syntax	Example	Description
-sL	nmap 172.16.1.1-5 -sL	List 172.16.1.1 without scanning
-sn	nmap 172.16.1.1/8 -sn	Disable port scanning
-Pn	nmap 172.16.1.1-8 -Pn	Port scans only and no host discovery
-PS	nmap 172.16.1.185 -PS22-25,80	TCP SYN discovery on specified port
-PA	nmap 172.16.1.185 -PA22-25,80	TCP ACK discovery on specified port
-PU	nmap 172.16.1.1-8 -PU53	UDP discovery on specified port
-PR	nmap 172.16.1.1-1/8 -PR	ARP discovery within local network
-n	nmap 172.16.1.1 -n	no DNS resolution

Scanning Command Syntax

nmap [scan types] [options] {172.16.1.1 specification}

Use of Nmap Scripts NSE

nmap --script= test script 172.16.1.0/24	execute thee listed script against target IP address
nmap --script-update-db	adding new scripts
nmap -sV -sC	use of safe default scripts for scan
nmap --script-help="Test Script"	get help for script

Version Detection

Switch/Syntax	Example	Description
-sV	nmap 172.16.1.1 -sV	Try to find the version of the service running on port
-sV --version-intensity	nmap 172.16.1.1 -sV --version-intensity 6	Intensity level range 0 to 9.
-sV --version-all	nmap 172.16.1.1 -sV --version-all	Set intensity level to 9
-sV --version-light	nmap 172.16.1.1 -sV --version-light	Enable light mode
-A	nmap 172.16.1.1 -A	Enables OS detection, version detection, script scanning, and traceroute
-O	nmap 172.16.1.1 -O	Remote OS detection

Nmap output Formats

Default/normal output	nmap -oN scan.txt 172.16.1.1
XML	nmap -oX scanr.xml 172.16.1.1
Grepable format	snmap -oG grep.txt 172.16.1.1
All formats	nmap -oA 172.16.1.1

172.16.1.1 Specification

nmap 172.16.1.1	single IP scan
nmap 172.16.1.1 172.16.100.1	scan specific IPs
nmap 172.16.1.1-254	scan a range of IPs
nmap xyz.org	scan a domain
nmap 10.1.1.0/8	scan using CIDR notation
nmap -iL scan.txt	scan 172.16.1.1s from a file
nmap --exclude 172.16.1.1	specified IP s exclude from scan

Firewall Proofing

nmap -f [172.16.1.1]	scan fragment packets
nmap –mtu [MTU] [172.16.1.1]	specify MTU
nmap -sI [zombie] [172.16.1.1]	scan idle zoombie
nmap –source-port [port] [172.16.1.1]	manual source port - specify
nmap –data-length [size] [172.16.1.1]	randomly append data
nmap –randomize-hosts [172.16.1.1]	172.16.1.1 scan order randomization
nmap –badsum [172.16.1.1]	bad checksum

Miscellaneous Commands

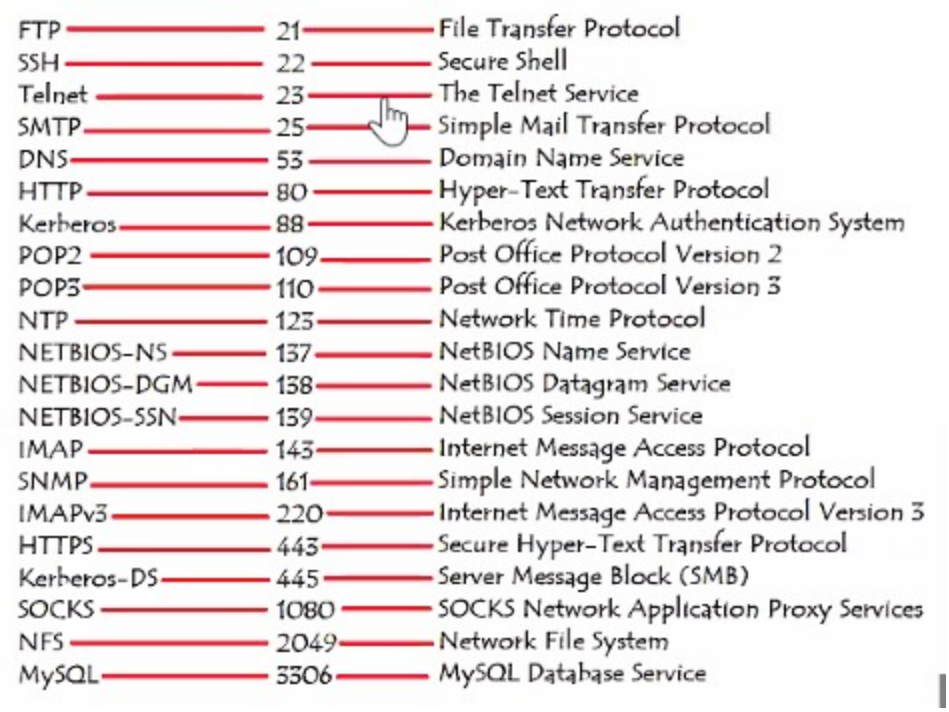
nmap -6	scan IPV6 targets
nmap –proxies proxy 1 URL, proxy 2 URL	Run in targets with proxies
nmap –open	Show open ports only

Nmap Timing Options

Syntax	Description
nmap -T0 172.16.1.1	Slowest scan
nmap -T1 172.16.1.1	Tricky scan to avoid IDS
nmap -T2 172.16.1.1	Timely scan
nmap -T3 172.16.1.1	Default scan timer
nmap -T4 172.16.1.1	Aggressive scan
nmap -T5 172.16.1.1	Very aggressive scan

Scan Options

Syntax	Description
nmap -sP 172.16.1.1	Ping scan only
nmap -PU 172.16.1.1	UDP ping scan
nmap -PE 172.16.1.1	ICMP echo ping
nmap -PO 172.16.1.1	IP protocol ping
nmap -PR 172.16.1.1	ARP ping
nmap -Pn 172.16.1.1	Scan without pinging
nmap –traceroute 172.16.1.1	Traceroute



Task - Performing nmap commands on Metaspoitable

Port Specification Options

1. Scanning specific port

```
┌──(kali㉿kali)-[~]
└─$ nmap -p 443 192.168.1.11
Starting Nmap 7.94 ( https://nmap.org ) at 2023-09-05 21:06 IST
Nmap scan report for 192.168.1.11
Host is up (0.00050s latency).

PORT    STATE  SERVICE
443/tcp closed https

Nmap done: 1 IP address (1 host up) scanned in 0.06 seconds

┌──(kali㉿kali)-[~]
└─$
```

2. Different port type scan

```
┌──(kali㉿kali)-[~]
└─$ nmap -pU:110,T:23-25,443 192.168.1.11
Starting Nmap 7.94 ( https://nmap.org ) at 2023-09-05 21:09 IST
WARNING: Your ports include "U:" but you haven't specified UDP scan with -sU.
Nmap scan report for 192.168.1.11
Host is up (0.00038s latency).

PORT    STATE  SERVICE
23/tcp  open   telnet
24/tcp  closed priv-mail
25/tcp  open   smtp
443/tcp closed https

Nmap done: 1 IP address (1 host up) scanned in 0.06 seconds
```

Scanning Types:

1. Top SYN port scan

```
┌──(kali㉿kali)-[~]
└─$ sudo nmap 192.168.1.11 -sS
[sudo] password for kali:
Starting Nmap 7.94 ( https://nmap.org ) at 2023-09-05 21:13 IST
Nmap scan report for 192.168.1.11
Host is up (0.00012s latency).
Not shown: 977 closed tcp ports (reset)
PORT     STATE SERVICE
21/tcp   open  ftp
22/tcp   open  ssh
23/tcp   open  telnet
25/tcp   open  smtp
53/tcp   open  domain
80/tcp   open  http
111/tcp  open  rpcbind
139/tcp  open  netbios-ssn
445/tcp  open  microsoft-ds
512/tcp  open  exec
513/tcp  open  login
514/tcp  open  shell
1099/tcp open  rmiregistry
1524/tcp open  ingreslock
2049/tcp open  nfs
2121/tcp open  ccproxy-ftp
3306/tcp open  mysql
5432/tcp open  postgresql
5900/tcp open  vnc
6000/tcp open  X11
6667/tcp open  irc
8009/tcp open  ajp13
8180/tcp open  unknown
MAC Address: 08:00:27:50:2E:0E (Oracle VirtualBox virtual NIC)

Nmap done: 1 IP address (1 host up) scanned in 0.32 seconds
```

2. Top ACK port scan

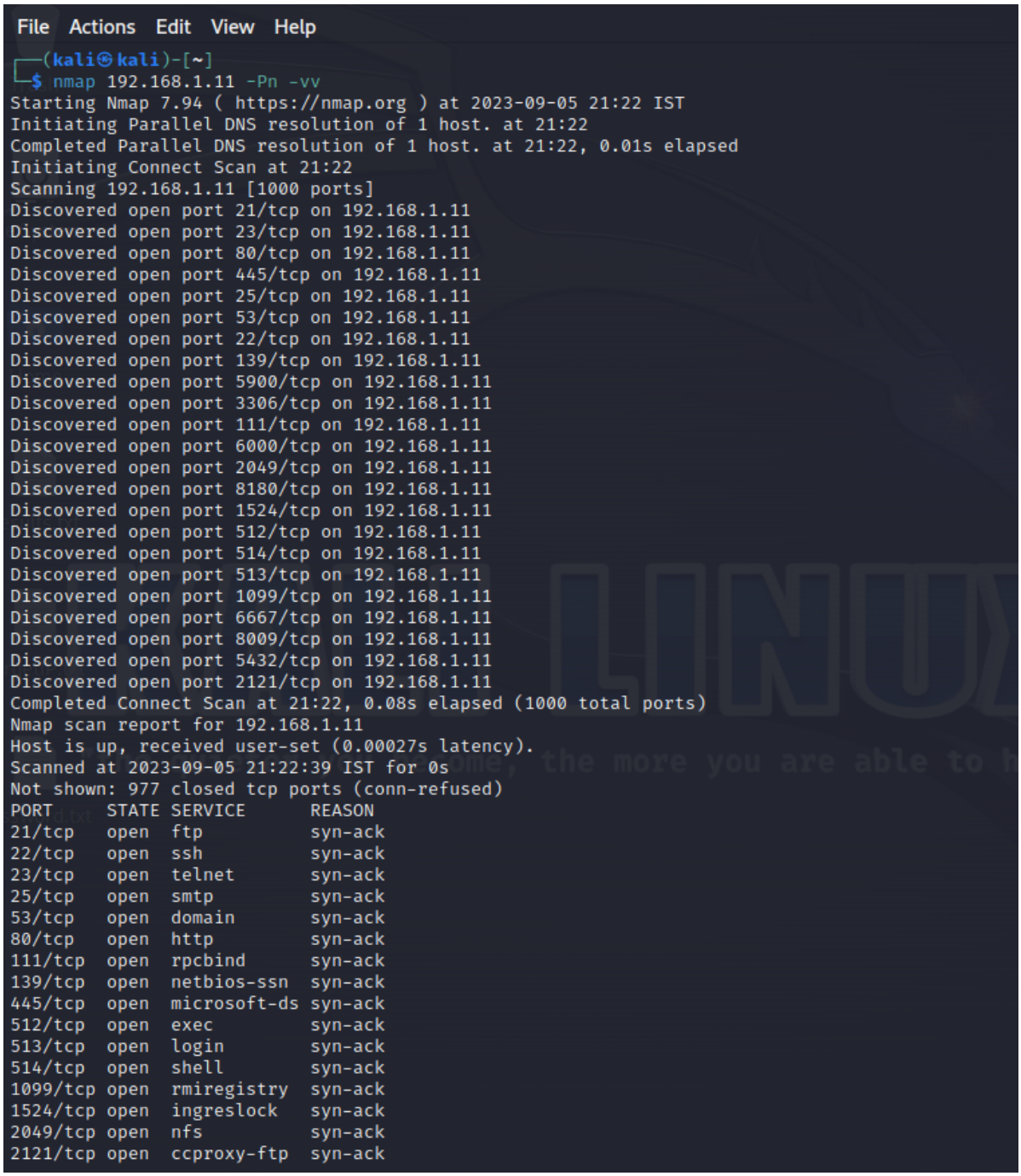
```
┌──(kali㉿kali)-[~]
└─$ sudo nmap 192.168.1.11 -sA
Starting Nmap 7.94 ( https://nmap.org ) at 2023-09-05 21:14 IST
Nmap scan report for 192.168.1.11
Host is up (0.00013s latency).
All 1000 scanned ports on 192.168.1.11 are in ignored states.
Not shown: 1000 unfiltered tcp ports (reset)
MAC Address: 08:00:27:50:2E:0E (Oracle VirtualBox virtual NIC)

Nmap done: 1 IP address (1 host up) scanned in 0.30 seconds
```

3. Ping scan

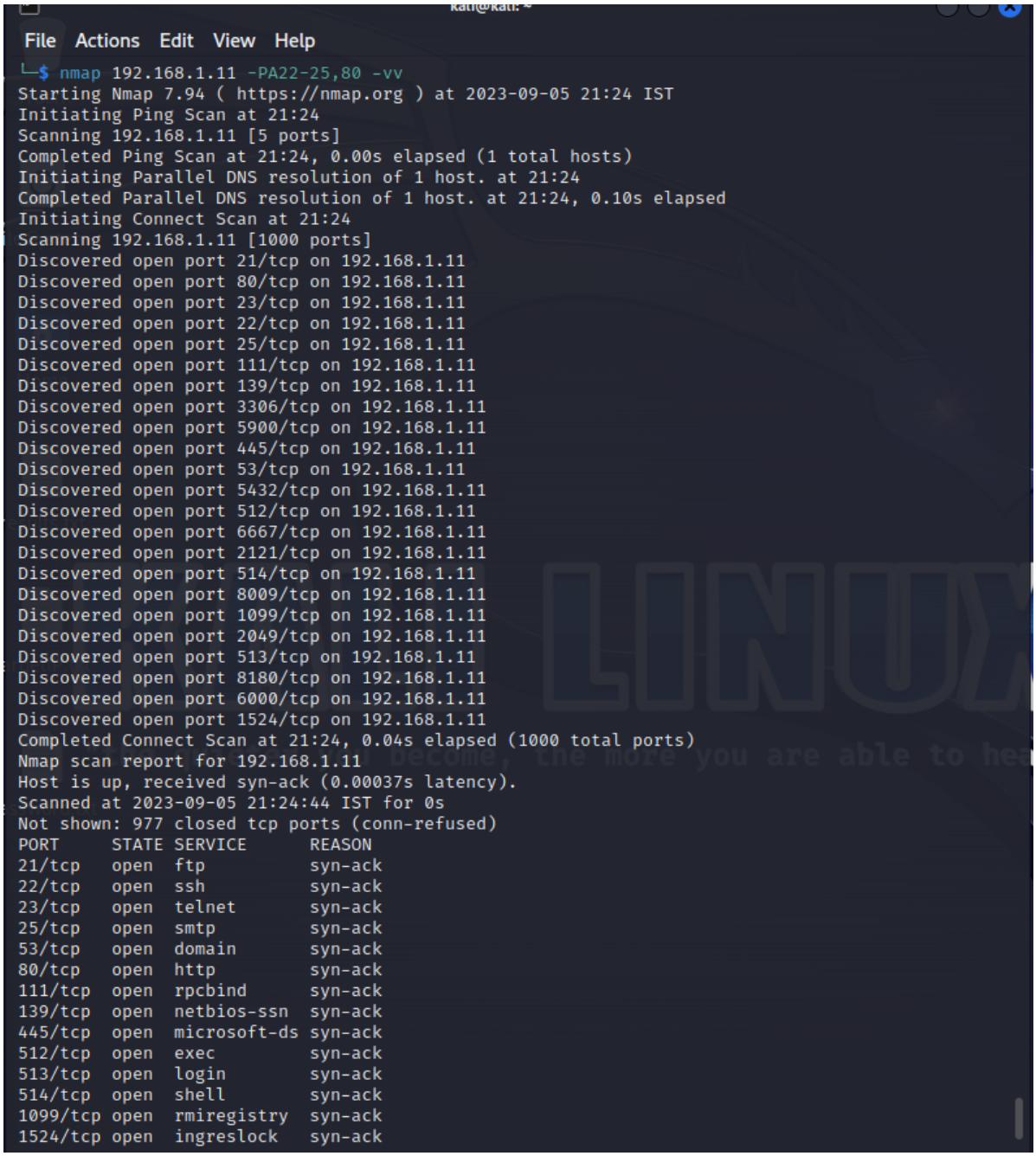
```
┌──(kali㉿kali)-[~]
└─$ nmap -sP 192.168.1.11 -vv
Warning: The -sP option is deprecated. Please use -sn
Starting Nmap 7.94 ( https://nmap.org ) at 2023-09-05 21:19 IST
Initiating Ping Scan at 21:19
Scanning 192.168.1.11 [2 ports]
Completed Ping Scan at 21:19, 0.00s elapsed (1 total hosts)
Initiating Parallel DNS resolution of 1 host. at 21:19
Completed Parallel DNS resolution of 1 host. at 21:19, 0.01s elapsed
Nmap scan report for 192.168.1.11
Host is up, received syn-ack (0.00082s latency).
Nmap done: 1 IP address (1 host up) scanned in 0.01 seconds
```

Host Discovery

1. Port Scans only and no host discovery

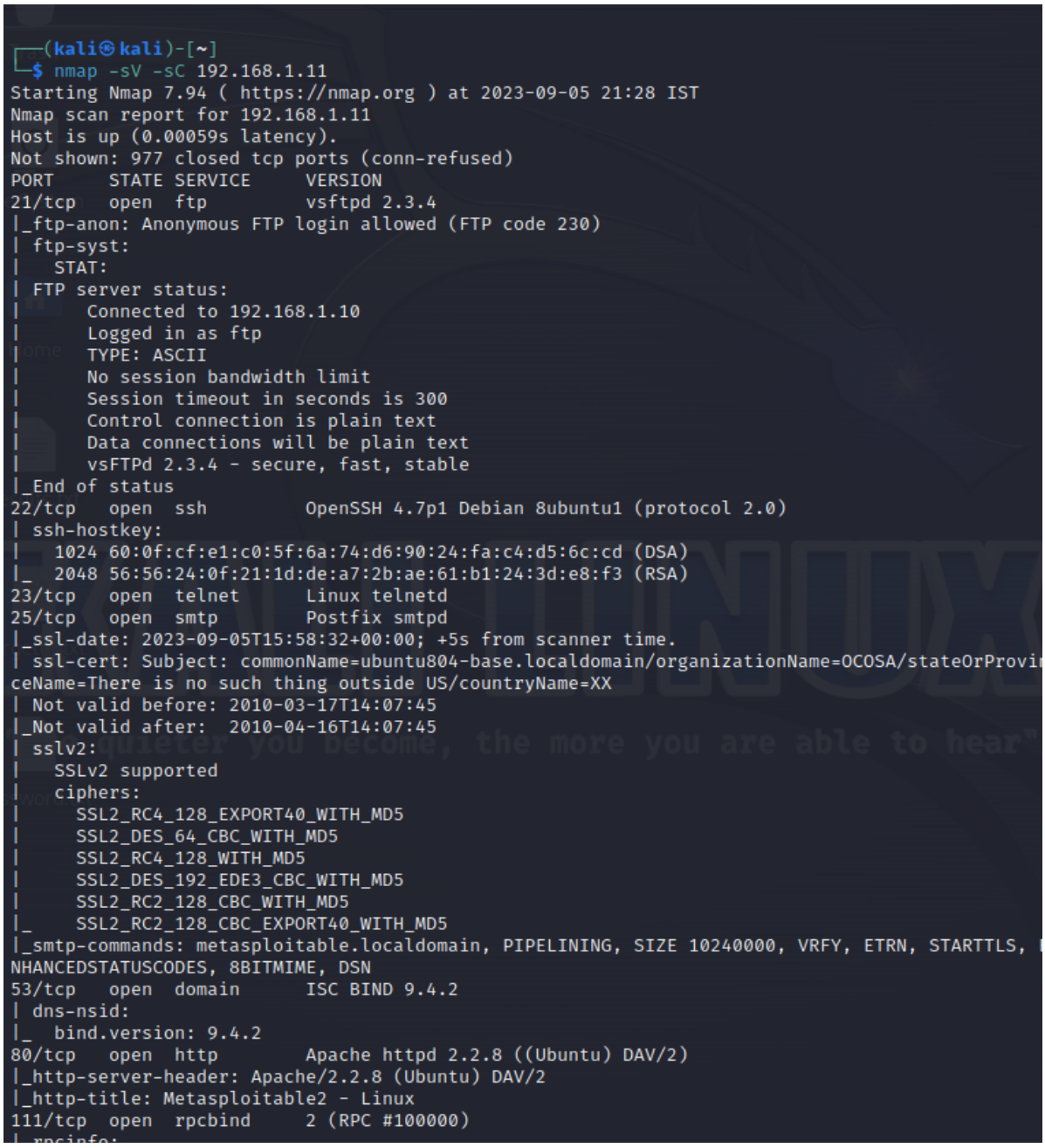


2. TCP Ack discovery on specified port



Use of nmap script scripts NSE

1. Use of safe default scripts



Version Detection

1. Try to find the version of service running on port

```
┌──(kali㉿kali)-[~]
└─$ nmap -sV 192.168.1.11
Starting Nmap 7.94 ( https://nmap.org ) at 2023-09-05 21:30 IST
Nmap scan report for 192.168.1.11
Host is up (0.00034s latency).
Not shown: 977 closed tcp ports (conn-refused)
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  tcpwrapped
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  http        Apache Tomcat/Coyote JSP engine 1.1
Service Info: Hosts:  metasploitable.localdomain, irc.Metasploitable.LAN; OSs: Unix, Linux; CPE
: cpe:/o:linux:linux_kernel

Service detection performed. Please report any incorrect results at https://nmap.org/submit/ .
Nmap done: 1 IP address (1 host up) scanned in 11.68 seconds
```

2. Enable OS Detection, version detection, script scanning and traceroute (Aggressive scanning)

Nmap Output format

1. Grepable format

```
┌──(kali㉿kali)-[~]
└─$ nmap -A 192.168.1.11 -oX grep.txt
Starting Nmap 7.94 ( https://nmap.org ) at 2023-09-05 21:36 IST
Nmap scan report for 192.168.1.11
Host is up (0.00059s latency).
Not shown: 977 closed tcp ports (conn-refused)
PORT     STATE SERVICE     VERSION
21/tcp   open  ftp         vsftpd 2.3.4
|_ftp-anon: Anonymous FTP login allowed (FTP code 230)
| ftp-syst:
|   STAT:
| FTP server status:
|      Connected to 192.168.1.10
|      Logged in as ftp
|      TYPE: ASCII
|      No session bandwidth limit
|      Session timeout in seconds is 300
|      Control connection is plain text
|      Data connections will be plain text
|      vsFTPd 2.3.4 - secure, fast, stable
|_End of status
22/tcp   open  ssh         OpenSSH 4.7p1 Debian 8ubuntu1 (protocol 2.0)
| ssh-hostkey:
|   1024 60:0f:cf:e1:c0:5f:6a:74:d6:90:24:fa:c4:d5:6c:cd (DSA)
|_  2048 56:56:24:0f:21:1d:de:a7:2b:ae:61:b1:24:3d:e8:f3 (RSA)
23/tcp   open  telnet      Linux telnetd
25/tcp   open  smtp        Postfix smtpd
| ssl-cert: Subject: commonName=ubuntu804-base.localdomain/organizationName=OCOSA/stateOrProvin
ceName=There is no such thing outside US/countryName=XX
| Not valid before: 2010-03-17T14:07:45
|_Not valid after:  2010-04-16T14:07:45
| sslv2:
|   SSLv2 supported
|   ciphers:
|     SSL2_DES_192_EDE3_CBC_WITH_MD5
|     SSL2_DES_64_CBC_WITH_MD5
|     SSL2_RC4_128_WITH_MD5
|     SSL2_RC4_128_EXPORT40_WITH_MD5
|     SSL2_RC2_128_CBC_WITH_MD5
|_    SSL2_RC2_128_CBC_EXPORT40_WITH_MD5
|_ssl-date: 2023-09-05T16:06:34+00:00; +5s from scanner time.
|_smtp-commands: metasploitable.localdomain, PIPELINING, SIZE 10240000, VRFY, ETRN, STARTTLS, E
NHANCEDSTATUSCODES, 8BITMIME, DSN
53/tcp   open  domain      ISC BIND 9.4.2
| dns-nsid:
|_  bind.version: 9.4.2
80/tcp   open  http        Apache httpd 2.2.8 ((Ubuntu) DAV/2)
```

2. Normal format

```
┌──(kali㉿kali)-[~]
└─$ nmap -A 192.168.1.11 > scan.txt
```

Firewall Proofing

1. Scan fragments packets

```
┌──(kali㉿kali)-[~]
└─$ sudo nmap -f [192.168.1.11] -vv
[sudo] password for kali:
Starting Nmap 7.94 ( https://nmap.org ) at 2023-09-05 21:40 IST
Failed to resolve "[192.168.1.11]".
Read data files from: /usr/bin/../share/nmap
WARNING: No targets were specified, so 0 hosts scanned.
Nmap done: 0 IP addresses (0 hosts up) scanned in 0.06 seconds
           Raw packets sent: 0 (0B) | Rcvd: 0 (0B)
```

2. Bad checksum

```
┌──(kali㉿kali)-[~]
└─$ sudo nmap -badsum [192.168.1.11] -vv
Starting Nmap 7.94 ( https://nmap.org ) at 2023-09-05 21:41 IST
Failed to resolve "[192.168.1.11]".
Read data files from: /usr/bin/../share/nmap
WARNING: No targets were specified, so 0 hosts scanned.
Nmap done: 0 IP addresses (0 hosts up) scanned in 0.06 seconds
           Raw packets sent: 0 (0B) | Rcvd: 0 (0B)
```

Miscellaneous Commands

1. Show open ports only

```
┌──(kali㉿kali)-[~]
└─$ nmap -open 192.168.1.11
Starting Nmap 7.94 ( https://nmap.org ) at 2023-09-05 21:45 IST
Nmap scan report for 192.168.1.11
Host is up (0.00029s latency).
Not shown: 977 closed tcp ports (conn-refused)
PORT     STATE SERVICE
21/tcp   open  ftp
22/tcp   open  ssh
23/tcp   open  telnet
25/tcp   open  smtp
53/tcp   open  domain
80/tcp   open  http
111/tcp  open  rpcbind
139/tcp  open  netbios-ssn
445/tcp  open  microsoft-ds
512/tcp  open  exec
513/tcp  open  login
514/tcp  open  shell
1099/tcp open  rmiregistry
1524/tcp open  ingreslock
2049/tcp open  nfs
2121/tcp open  ccproxy-ftp
3306/tcp open  mysql
5432/tcp open  postgresql
5900/tcp open  vnc
6000/tcp open  X11
6667/tcp open  irc
8009/tcp open  ajp13
8180/tcp open  unknown

Nmap done: 1 IP address (1 host up) scanned in 0.15 seconds
```

2. Scan IPv6 targets

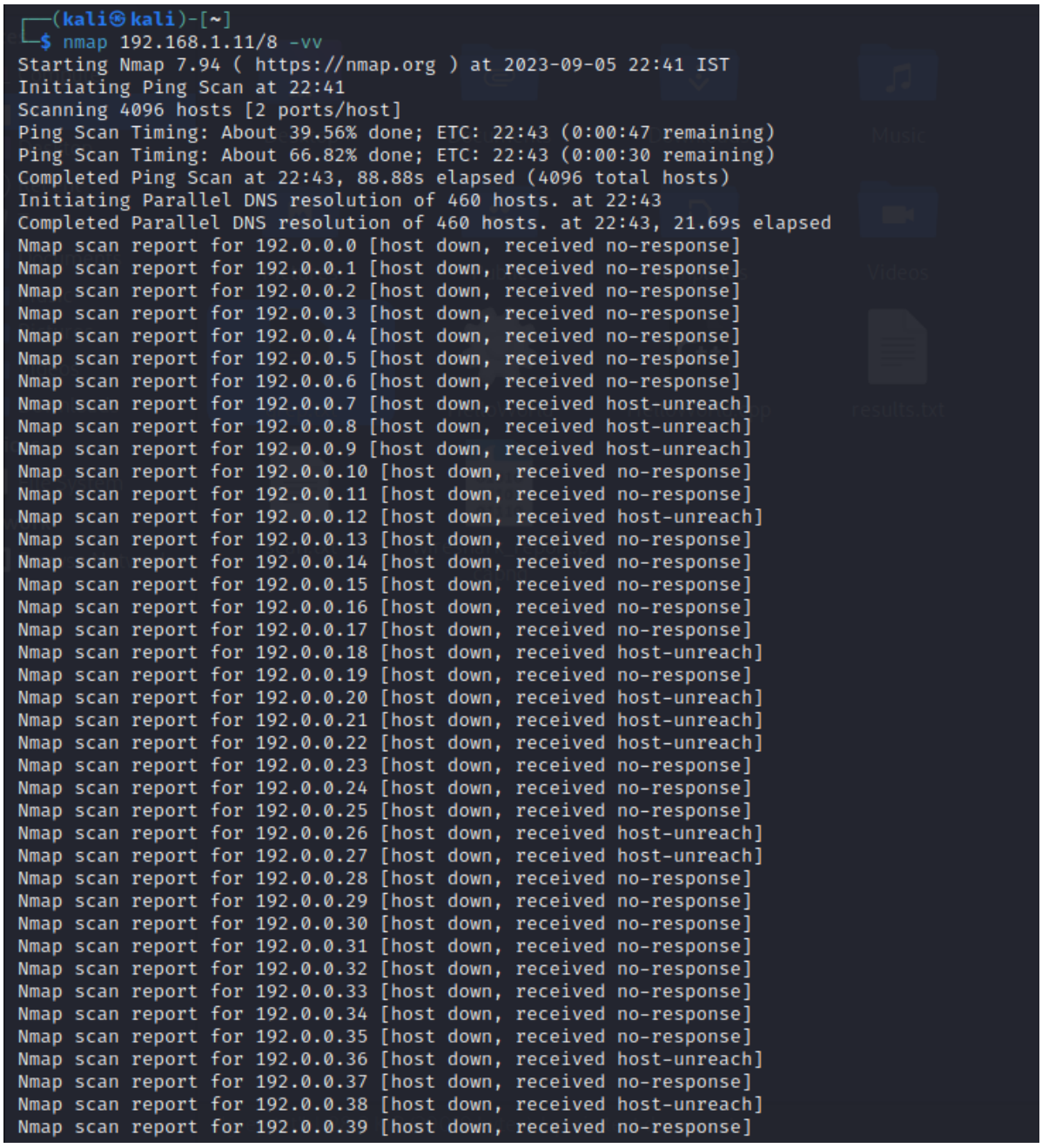
```
┌──(kali㉿kali)-[~]
└─$ nmap -6  ::1/128
Starting Nmap 7.94 ( https://nmap.org ) at 2023-09-05 21:48 IST
Nmap scan report for localhost (::1)
Host is up (0.00013s latency).
Not shown: 999 closed tcp ports (conn-refused)
PORT     STATE SERVICE
5432/tcp open  postgresql

Nmap done: 1 IP address (1 host up) scanned in 0.09 seconds
```

Specification

1. Scan a domain

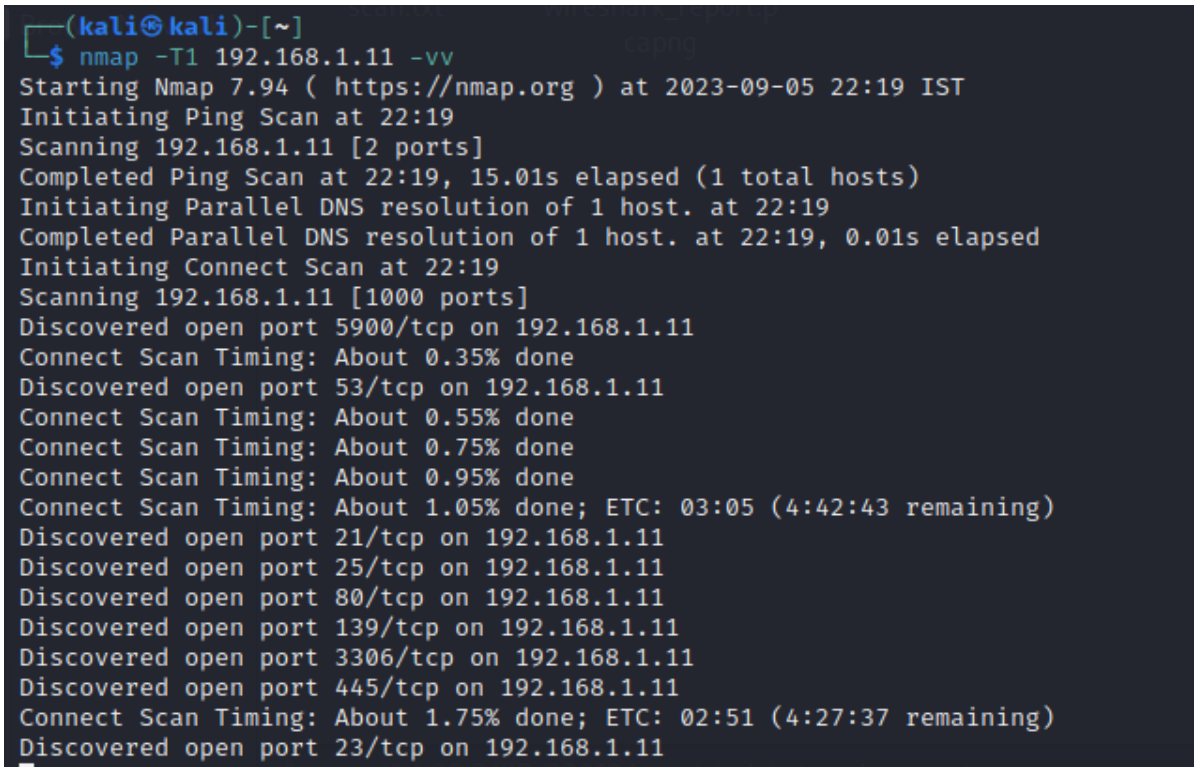
```
┌──(kali㉿kali)-[~]
└─$ nmap www.notion.so
Starting Nmap 7.94 ( https://nmap.org ) at 2023-09-05 21:53 IST
Nmap scan report for www.notion.so (104.18.39.102)
Host is up (0.0061s latency).
Other addresses for www.notion.so (not scanned): 172.64.148.154 2606:4700:4400::6812:2766 2606:
4700:4400::ac40:949a
Not shown: 996 filtered tcp ports (no-response)
PORT     STATE SERVICE
80/tcp   open  http
443/tcp  open  https
8080/tcp open  http-proxy
8443/tcp open  https-alt

Nmap done: 1 IP address (1 host up) scanned in 7.15 seconds
```

2. Scan using CIDR notation

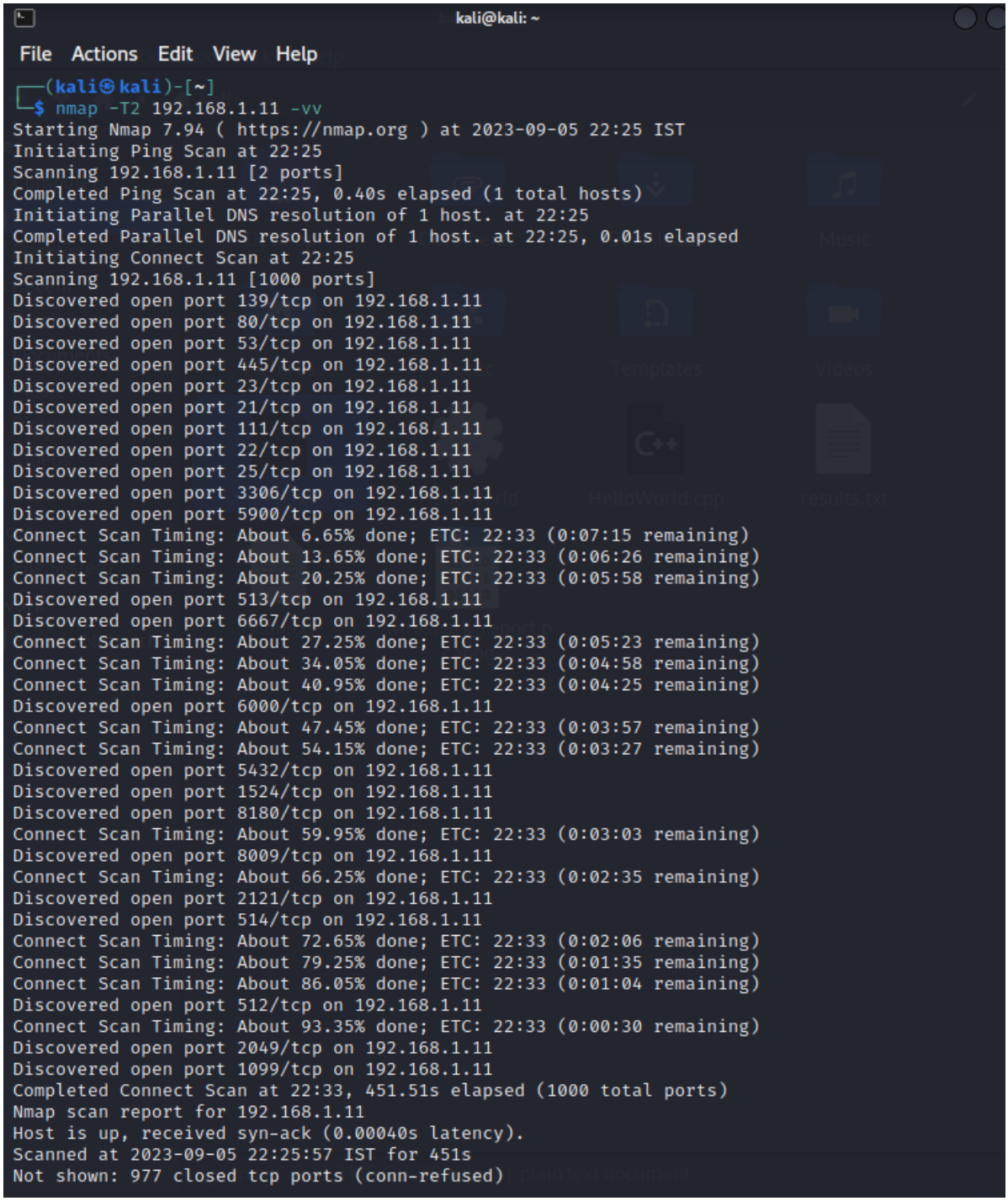


Nmap Timing Options

1. Tricky scan to avoid IDS



2. Timely Scan



Scan Options

1. Scan without ping

```
┌──(kali㉿kali)-[~]
└─$ sudo nmap -Pn 192.168.11.1 -vv
Starting Nmap 7.94 ( https://nmap.org ) at 2023-09-05 22:36 IST
Initiating Parallel DNS resolution of 1 host. at 22:36
Completed Parallel DNS resolution of 1 host. at 22:36, 0.01s elapsed
Initiating SYN Stealth Scan at 22:36
Scanning 192.168.11.1 [1000 ports]
SYN Stealth Scan Timing: About 15.00% done; ETC: 22:40 (0:02:56 remaining)
SYN Stealth Scan Timing: About 30.00% done; ETC: 22:40 (0:02:22 remaining)
SYN Stealth Scan Timing: About 44.50% done; ETC: 22:40 (0:01:53 remaining)
SYN Stealth Scan Timing: About 59.50% done; ETC: 22:40 (0:01:22 remaining)
SYN Stealth Scan Timing: About 74.00% done; ETC: 22:40 (0:00:53 remaining)
Completed SYN Stealth Scan at 22:40, 205.01s elapsed (1000 total ports)
Nmap scan report for 192.168.11.1
Host is up, received user-set.
Scanned at 2023-09-05 22:36:54 IST for 205s
All 1000 scanned ports on 192.168.11.1 are in ignored states.
Not shown: 1000 filtered tcp ports (no-response)

Read data files from: /usr/bin/../share/nmap
Nmap done: 1 IP address (1 host up) scanned in 205.11 seconds
           Raw packets sent: 2000 (88.000KB) | Rcvd: 8 (672B)
```

2. Traceroute

```
┌──(kali㉿kali)-[~]
└─$ sudo nmap -traceroute 192.168.11.1 -vv
Starting Nmap 7.94 ( https://nmap.org ) at 2023-09-05 22:41 IST
Initiating Ping Scan at 22:41
Scanning 192.168.11.1 [4 ports]
Completed Ping Scan at 22:41, 3.03s elapsed (1 total hosts)
Nmap scan report for 192.168.11.1 [host down, received no-response]
Read data files from: /usr/bin/../share/nmap
Note: Host seems down. If it is really up, but blocking our ping probes, try -Pn
Nmap done: 1 IP address (0 hosts up) scanned in 3.11 seconds
           Raw packets sent: 8 (304B) | Rcvd: 0 (0B)
```