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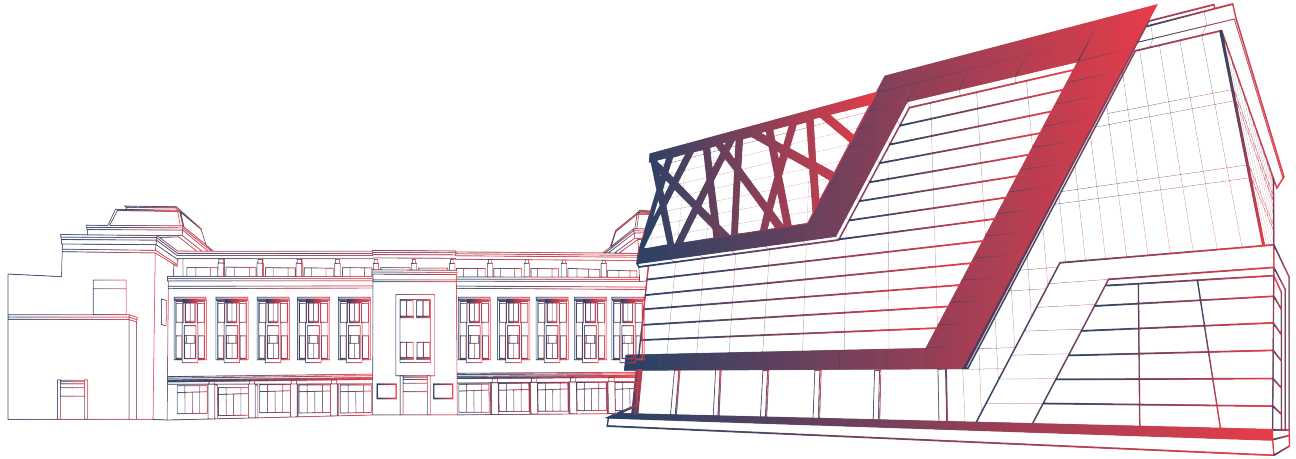
Types of Scan

NMAP



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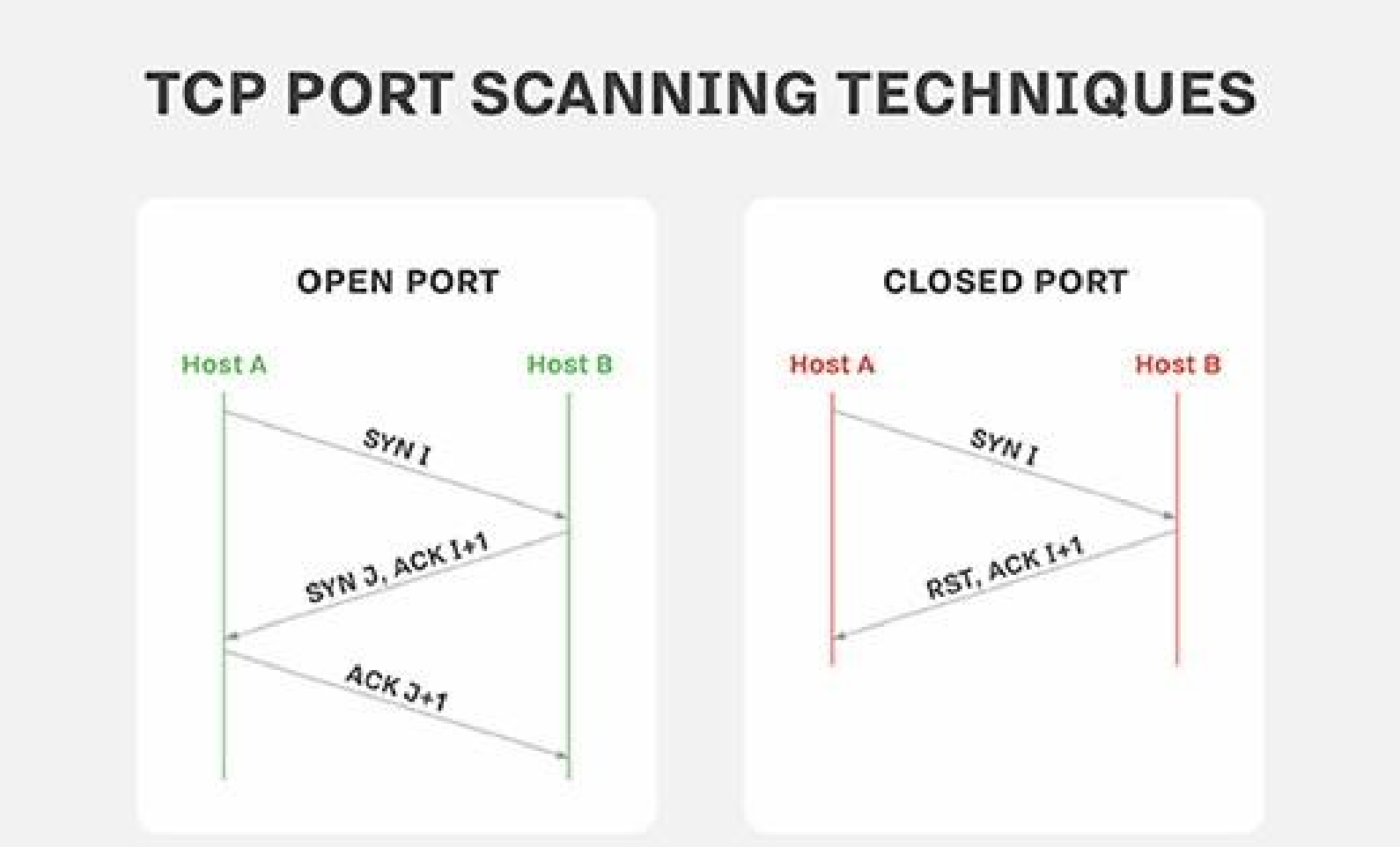
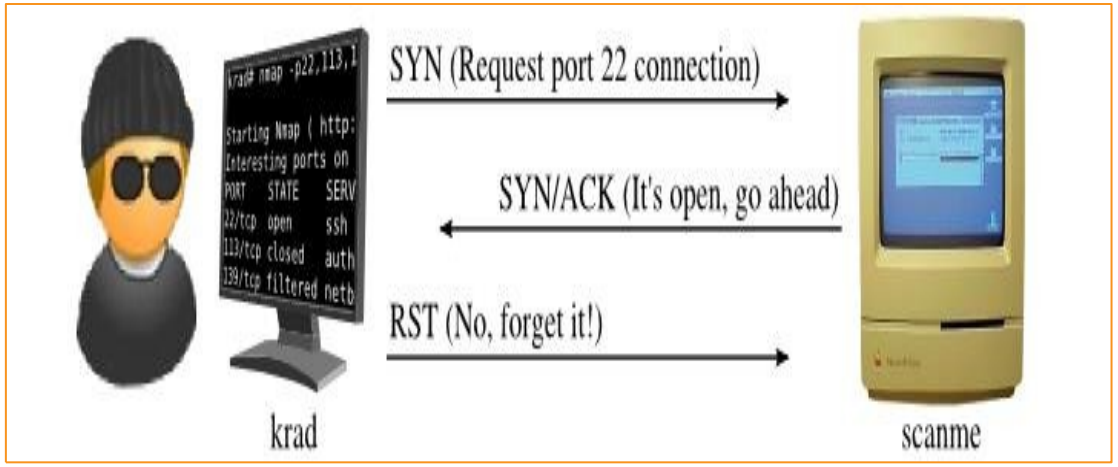
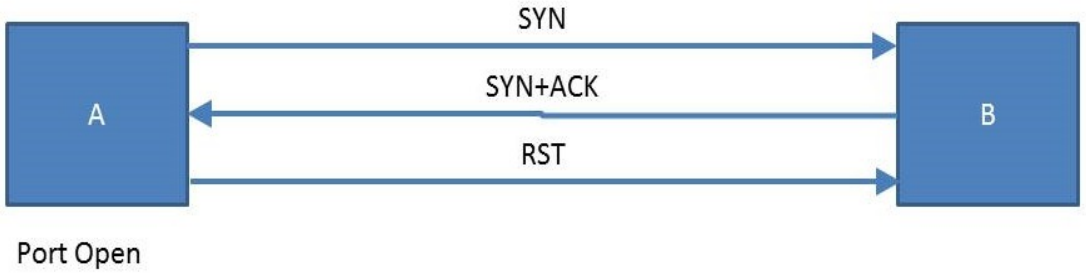
TCP/Connect/Regular Scan (Nmap -sT)



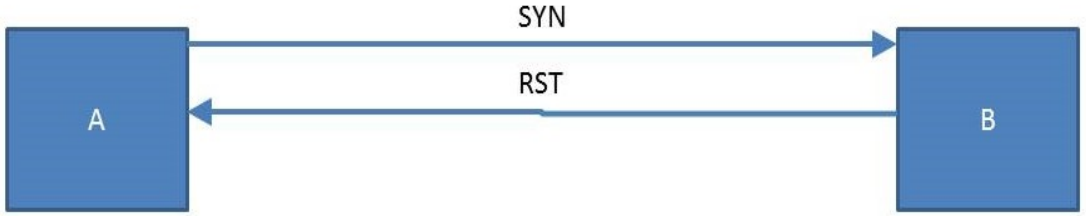
TCP Syn/Stealth scan (Nmap -sS)



Port is open



Port Open



Port Closed

Nmap features

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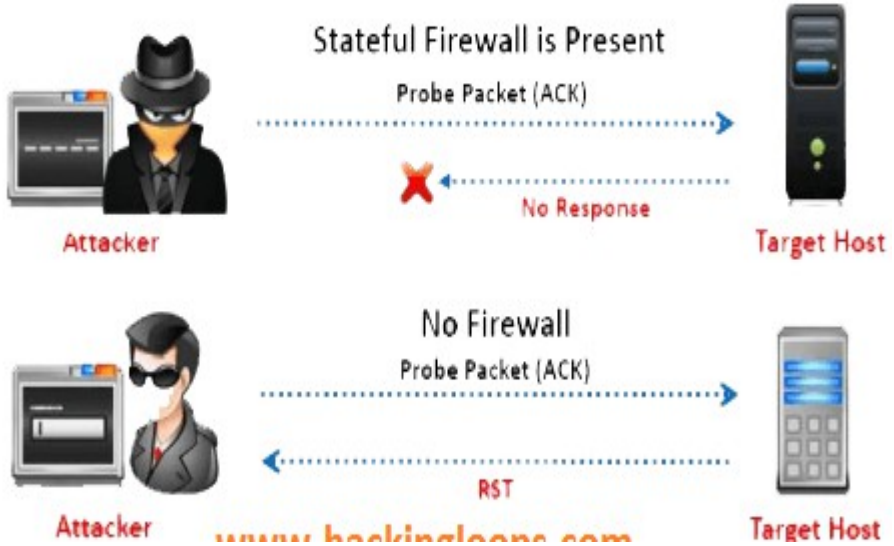
Regular Scan

- Attempt **full connection** with port
- Scanned system **knows scan is occurring**
- SYN, ACK+SYN, **ACK**
- **Can identify scanner**

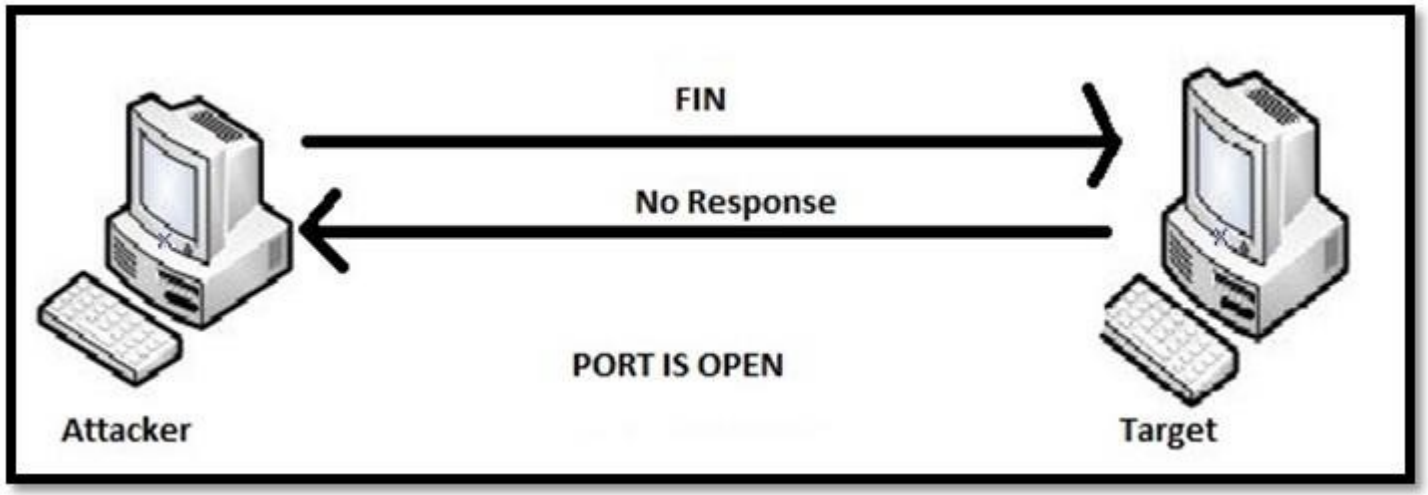
Stealth Scanning

- Attempt **partial connection** with port
- System **may not know scan is occurring**
- SYN, ACK+SYN
- May **not be able to identify scanner**

ACK Scan (Nmap -sA)



FIN Scan (Nmap –sF)



Port Open	Port Closed
1 FIN →	1 FIN → ← RST 2

Basic scanning with Nmap

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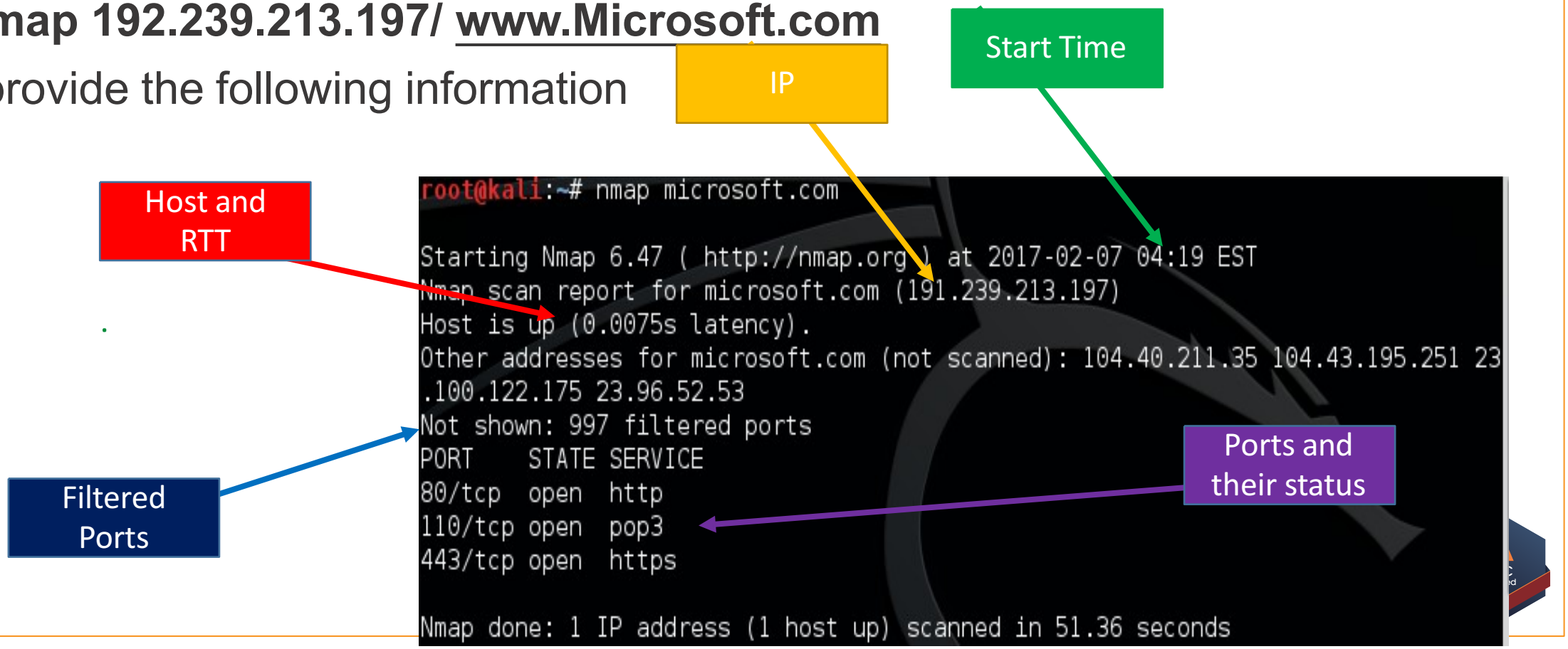
1. **nmap <*target*>** IP or Domain name
   - scans 1,000 TCP ports on the host <*target*>.
- e.g. **nmap 192.239.213.197/ www.Microsoft.com**
- It will provide the following information



Nmap commands

- **How will you identify is this machine-linux/windows?**
  - In windows, 3 ports will always be open
  - 135 - msrp
  - 139 - netbios-ssn
  - 445 – Microsoft-ds

- Try on Linux machine- Take IP address of Linux- all these 3 ports are closed
  - Start SMBD service
    - Service smbd start
  - Scan all ports again in Linux
  - Check for all ports
  - It will show 2 ports open

Nmap scan commands

Nmap Examples

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2. Scan multiple IP address or subnet (IPv4)

Nmap 192.168.195.1-255 (check for whole range of IP from 1 to 255)

Nmap 192.168.195.1/16

- It will check for 254 hosts (16 network and 16 host) Nmap 192.168.1.*

```
nmap 192.168.1.1 192.168.1.2 192.168.1.3

## works with same subnet i.e. 192.168.1.0/24
nmap 192.168.1.1,2,3

## You can scan a range of IP address too:
nmap 192.168.1.1-20

## You can scan a range of IP address using a wildcard:
nmap 192.168.1.*

## Finally, you scan an entire subnet:
nmap 192.168.1.0/24
```

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Nmap commands

3. Nmap –p 25 192.168.195.249
    - Port is closed

Check specific range

3a. Nmap –p 1000-1200 192.168.195.249
    - Scans from 1000-1200
    - Fast because less scan

Nmap -p 80,443 192.168.1.1

Nmap --top-ports 5 192.168.1.1

Scan top ports i.e. scan $number most common ports

Nmap --top-ports 10 192.168.1.1

Scan on Specific port

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```
root@kali:~# nmap -p 20-25,80,443 microsoft.com

Starting Nmap 6.47 ( http://nmap.org ) at 2017-02-07 05:06 EST
Nmap scan report for microsoft.com (104.40.211.35)
Host is up (0.0032s latency).
Other addresses for microsoft.com (not scanned): 104.43.195.251 23.100.122.175 2
3.96.52.53 191.239.213.197
PORT    STATE    SERVICE
20/tcp  filtered ftp-data
21/tcp  filtered ftp
22/tcp  filtered ssh
23/tcp  filtered telnet
24/tcp  filtered priv-mail
25/tcp  filtered smtp
80/tcp  open     http
443/tcp open     https
```

```
root@kali:~# nmap -p http,mysql microsoft.com

Starting Nmap 6.47 ( http://nmap.org ) at 2017-02-07 05:08 EST
Nmap scan report for microsoft.com (104.43.195.251)
Host is up (0.00080s latency).
Other addresses for microsoft.com (not scanned): 23.100.122.175 23.96.52.53 191.
239.213.197 104.40.211.35
PORT     STATE    SERVICE
80/tcp   open     http
3306/tcp filtered mysql
8008/tcp filtered http
```

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Nmap Examples

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Check all port range open/closed

Nmap –p 0-65535 192.168.195.249

Nmap –p- 192.168.195.249

Nmap –p “*” 192.168.195.249

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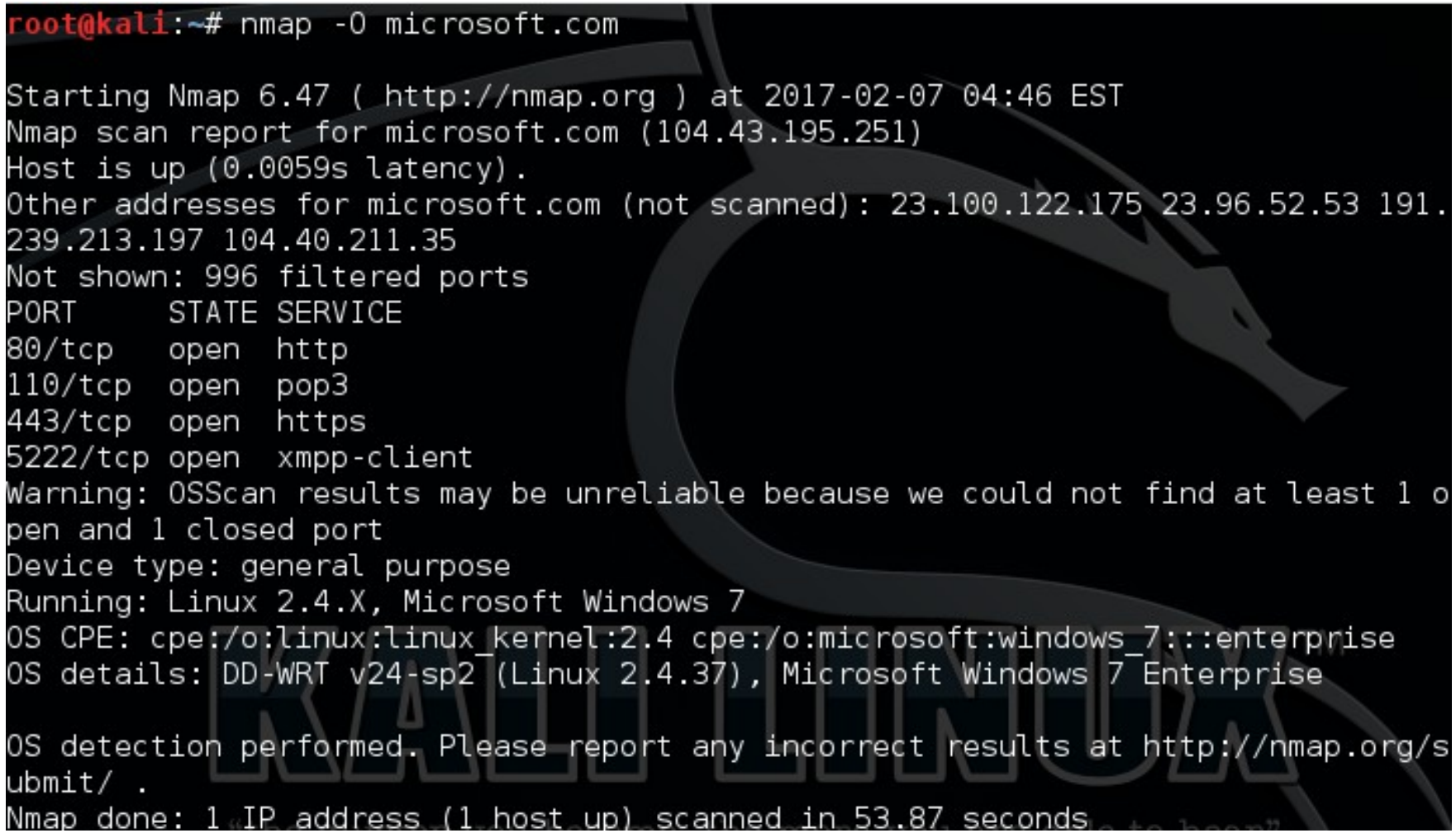
Scan on all port

Nmap commands

Find OS

4. Nmap –O 192.168.195.249
    - It requires root privilege, enter command sudo su
    - Device type: general purpose
        - If android- smartphone
        - If IOS- Iphone
    - OS details: it tells on the basis of services

Remote Host OS Detection



Nmap commands

For Fast scan

5a. Nmap -F 192.168.195.249

- F means that we going to scan 100 most popular ports (this option also required for quick scans)

5b. Nmap –T4 192.168.195.249

- T1- 1 packet in 1 sec
- T4- 4 packets in 1 sec - more power scan/fast
- T5 is the maximum, most aggressive scan)

Nmap commands/Scripts

6. **Stealthy scan**

nmap -sS 192.168.1.1

usr/share/nmap /scripts

TCP ports using **TCP connect scan** (warning: no stealth scan)- **OS Fingerprinting**

nmap -sT 192.168.1.1

Find out the most commonly used TCP ports using **TCP ACK scan**

nmap -sA 192.168.1.1

Find out the most commonly used TCP ports using **TCP Window scan**

nmap -sW 192.168.1.1

Nmap Examples

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Find out the most commonly used TCP ports using TCP SYN Scan

```
### Stealthy scan ###
nmap -sS 192.168.1.1

### Find out the most commonly used TCP ports using  TCP connect scan (warning: no stealth scan)
###  OS Fingerprinting ###
nmap -sT 192.168.1.1

### Find out the most commonly used TCP ports using TCP ACK scan
nmap -sA 192.168.1.1

### Find out the most commonly used TCP ports using TCP Window scan
nmap -sW 192.168.1.1
```

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Nmap Examples

6. Detect remote services (server / daemon) version numbers:

- Nmap –sV 192.168.195.249
  - -s script /--script
  - V Verbose

7. Nmap –sS –sV 192.168.195.249
  - -s script /--script
  - S sync
  - V Verbose-> bring data from/of header

Nmap commands

There are total 602 NSE scripts

- Cd path usr/share/nmap/scripts
- Now run the next command (9, 10)

- **You can also explicitly use a script**

8. Nmap --script=dhcp-discover google.com

Aggressive Scan/ Intense Scan

9. Nmap –A –T4 192.168.195.249

- A-Aggressive
- T4 increase power of nmap
- Gives service
- OS

Aggressive Scan-OS & Service Detection

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```
root@kali:~# nmap -A microsoft.com

Starting Nmap 6.47 ( http://nmap.org ) at 2017-02-07 04:21 EST
Nmap scan report for microsoft.com (104.40.211.35)
Host is up (0.0026s latency).
Other addresses for microsoft.com (not scanned): 104.43.195.251 23.100.122.175 2
3.96.52.53 191.239.213.197
Not shown: 997 filtered ports
PORT    STATE SERVICE VERSION
80/tcp  open  http?
110/tcp open  pop3?
443/tcp open  https?
Warning: OSScan results may be unreliable because we could not find at least 1 o
pen and 1 closed port
Device type: general purpose
Running: Linux 2.4.X, Microsoft Windows 7|XP
OS CPE: cpe:/o:linux:linux_kernel:2.4 cpe:/o:microsoft:windows_7:::enterprise cp
e:/o:microsoft:windows_xp::sp3
OS details: DD-WRT v24-sp2 (Linux 2.4.37), Microsoft Windows 7 Enterprise, Micro
soft Windows XP SP3
Network Distance: 2 hops
```

```
TRACEROUTE (using port 80/tcp)
HOP RTT     ADDRESS
1   0.09 ms 192.168.134.2
2   0.12 ms 104.40.211.35

OS and Service detection performed. Please report any incorrect results at http:
//nmap.org/submit/ .
Nmap done: 1 IP address (1 host up) scanned in 145.49 seconds
```

Nmap Examples

10. Only show open (or possibly open) ports

```
nmap --open 192.168.1.1
nmap --open exmple.com
```

11. Show host interfaces an

This is useful for debugging

Nmap --iflist