CSS Experiment: 1-B

Aim: Analyse the tool nmap and use it with different options to scan open ports, perform OS fingerprinting, do a ping scan, tcp port scan, udp port scan, xmas scan etc.

Nmap

1. Nmap is a network scanner
2. Nmap is used to discover hosts and services on a computer network by sending packets and analysing the responses.
3. Nmap provides a number of features for probing computer networks, including host discovery and service and operating system detection.

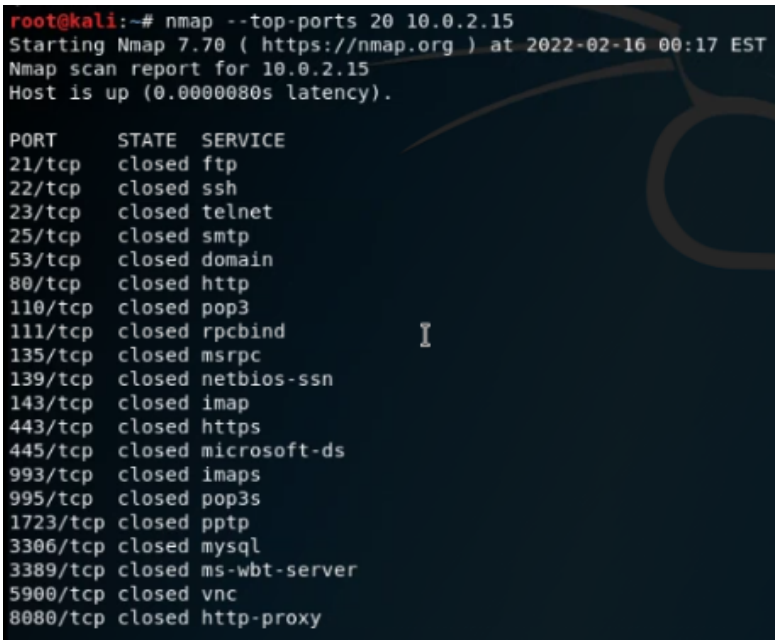
Nmap Commands

1. Port Scanning

It automatically scans a number of the most 'popular' ports for a host. To run the command:

- nmap –top-ports <ip>
- nmap --top-ports 20 <ip>

Replace the "20" with the number of ports to scan, and Nmap quickly scans that many ports. It returns a concise output that details the status of the most common ports, and this lets you quickly see whether you have any unnecessarily open ports.

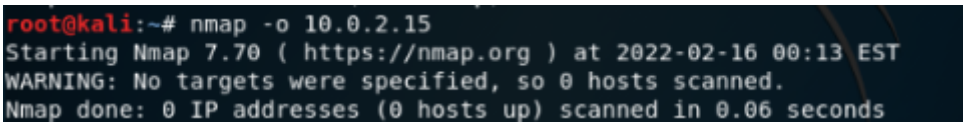


2. *OS Fingerprinting*

OS scanning is one of the most powerful features of Nmap. When using this type of scan, Nmap sends TCP and UDP packets to a particular port, and then analyses its response. It compares this response to a database of 2600 operating systems, and returns information on the OS (and version) of a host.

To run OS scan, type the following command

- nmap -O <target IP>

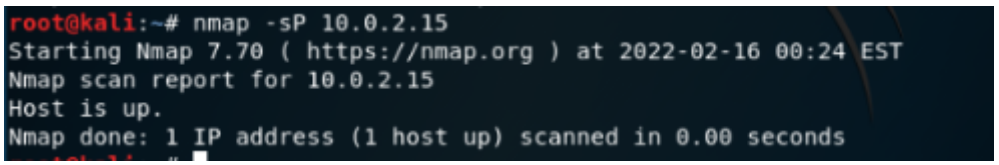


3. *Ping Scan*

A ping scan returns information on every active IP on your network

To run Ping scan, type the following command

- nmap -sP <target IP>

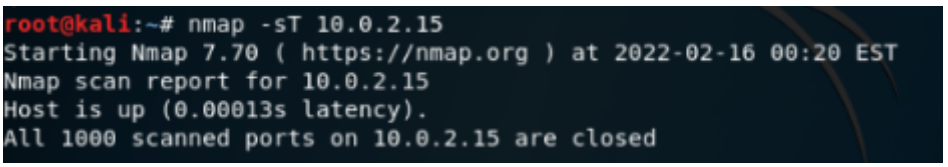


4. *TCP Port Scan*

One of the best things is the Nmap command to check open ports, and the second-best thing about Nmap is its power to work with TCP and UDP without any hiccups. Several services are limited to just TCP, but people understand the advantage of scanning UDP-based services. Here are the examples of both these services that are allowed by Nmap.

To run TCP Port scan, type the following command

- nmap -sT <target IP>



5. *UDP Port Scan*

To run UDP Port scan, type the following command

- nmap -sU localhost

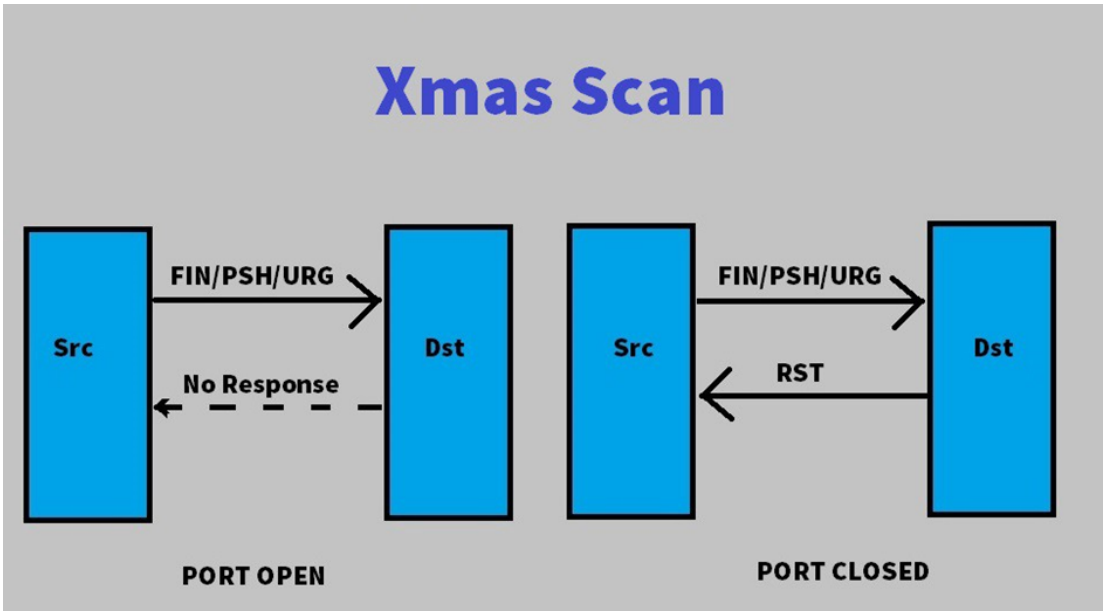
```
root@kali:~# nmap -sU localhost
Starting Nmap 7.70 ( https://nmap.org ) at 2022-02-16 00:21 EST
Nmap scan report for localhost (127.0.0.1)
Host is up (0.000010s latency).
Other addresses for localhost (not scanned): ::1
Not shown: 999 closed ports
PORT    STATE         SERVICE
68/udp open|filtered dhcpc
```

6. *XMAS Scan*

It Sets the FIN, PSH, and URG flags, lighting the packet up like a Christmas tree.

To run XMAS Scan, type the following command

- nmap -sX <target IP>



As we can see in the above picture when we send a packet with FIN/PSH/URG flag to set and send it to destination if we don't get any response from Destination we will know that Port is OPEN. if we get RST in return then we know that the Port is Closed.

```
root@kali:~# nmap -sX 10.0.2.15
Starting Nmap 7.70 ( https://nmap.org ) at 2022-02-16 00:50 EST
Nmap scan report for 10.0.2.15
Host is up (0.0000080s latency).
All 1000 scanned ports on 10.0.2.15 are closed
```

Conclusion: Successfully analysed the tool nmap and used it with various options to scan open ports, perform OS fingerprinting, perform a ping scan, tcp port scan, udp port scan, xmas scan, and so on.

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