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What is Nmap?

Nmap is an open-source utility for network discovery. Network Mapper is a security auditing and network scanning independent tool developed by **Gordon Lyon**. It is used by network administrators to detect the devices currently running on the system and the port number by which the devices are connected.

Many systems and network administrators are used for managing **network inventory, service upgrade schedules, monitoring hosts** and **service uptime**.

Nmap Definition

At the top-level, Nmap is defined as a tool that can detect or diagnose services that are running on an **Internet-connected system** by a network administrator in their networked system used to identify potential security flaws. It is used to automate redundant tasks, such as monitoring the service.

Working of Nmap

Nmap is convenient during penetration testing of networked systems. Nmap provides the network details, and also helps to determine the security flaws present in the system. Nmap is **platform-independent** and runs on popular **operating systems** such as **Linux, Windows** and **Mac**.

Advantages of Nmap

Nmap has a lot of advantages that make it different from other network scanning tools. Nmap is open-source and **free** to use.

Some other advantages are listed below.

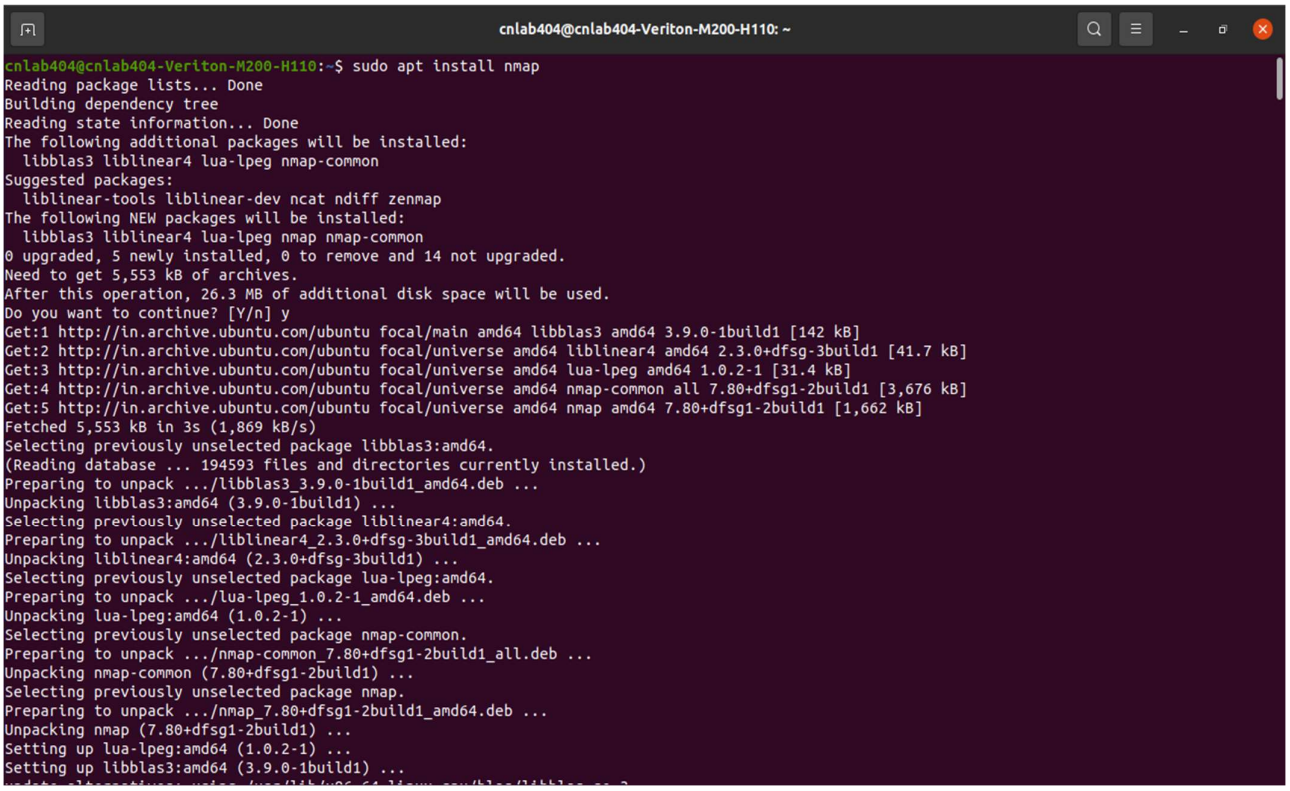
- It is used for auditing network systems as it can detect new servers.
- It will search for **subdomain** and Domain Name System
- With the help of Nmap Scripting Engine (**NSE**), interaction can be made with the target host.

- It determines the nature of the service in the host and performs whether the host is a mail service or a web server.

How to install Nmap Command

Before exploring with Nmap commands, the Nmap scanner tool must have installed on your system. So, if it is not downloaded yet, get it by opening up the terminal and executing the following command:

sudo apt install nmap



sudo

How to scan hostname using Nmap command

To perform a scan using hostname and IP address is the best way to run Nmap commands. For example, I set the hostname as “linuxhint.com

nmap linuxhint.com

```
cnlab404@cnlab404-Veriton-M200-H110:~$ nmap linuxhint.com
Starting Nmap 7.80 ( https://nmap.org ) at 2023-03-10 09:41 IST
Nmap scan report for linuxhint.com (104.18.7.55)
Host is up (0.0038s latency).
Other addresses for linuxhint.com (not scanned): 104.18.6.55 2606:4700::6812:637 2606:4700::6812:737
Not shown: 996 filtered ports
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 4.97 seconds
```

```
cnlab404@cnlab404-Veriton-M200-H110:~$ sudo nmap 10.0.2.15
Starting Nmap 7.80 ( https://nmap.org ) at 2023-03-10 09:43 IST
Nmap scan report for 10.0.2.15
Host is up (0.00018s latency).
All 1000 scanned ports on 10.0.2.15 are filtered

Nmap done: 1 IP address (1 host up) scanned in 4.23 seconds
```

```
cnlab404@cnlab404-Veriton-M200-H110:~$ nmap -v linuxhint.com
Starting Nmap 7.80 ( https://nmap.org ) at 2023-03-10 09:44 IST
Initiating Ping Scan at 09:44
Scanning linuxhint.com (104.18.6.55) [2 ports]
Completed Ping Scan at 09:44, 0.00s elapsed (1 total hosts)
Initiating Parallel DNS resolution of 1 host. at 09:44
Completed Parallel DNS resolution of 1 host. at 09:44, 0.00s elapsed
Initiating Connect Scan at 09:44
Scanning linuxhint.com (104.18.6.55) [1000 ports]
Discovered open port 80/tcp on 104.18.6.55
Discovered open port 8080/tcp on 104.18.6.55
Discovered open port 443/tcp on 104.18.6.55
Discovered open port 8443/tcp on 104.18.6.55
Completed Connect Scan at 09:44, 4.71s elapsed (1000 total ports)
Nmap scan report for linuxhint.com (104.18.6.55)
Host is up (0.0043s latency).
Other addresses for linuxhint.com (not scanned): 104.18.7.55 2606:470
::6812:737 2606:4700::6812:637
Not shown: 996 filtered ports
PORT     STATE SERVICE
80/tcp   open  http
443/tcp  open  https
8080/tcp open  http-proxy
8443/tcp open  https-alt

Read data files from: /usr/bin/../share/nmap
Nmap done: 1 IP address (1 host up) scanned in 4.80 seconds
```

```
cnlab404@cnlab404-Veriton-M200-H110:~$ nmap 10.0.2.15
Starting Nmap 7.80 ( https://nmap.org ) at 2023-03-10 09:45 IST
Note: Host seems down. If it is really up, but blocking our ping probe
s, try -Pn
Nmap done: 1 IP address (0 hosts up) scanned in 3.05 seconds
```

```
cnlab404@cnlab404-Veriton-M200-H110:~$ sudo nmap -O linuxhint.com
Starting Nmap 7.80 ( https://nmap.org ) at 2023-03-10 09:51 IST
Nmap scan report for linuxhint.com (104.18.7.55)
Host is up (0.0019s latency).
Other addresses for linuxhint.com (not scanned): 104.18.6.55 2606:4700
::6812:737 2606:4700::6812:637
All 1000 scanned ports on linuxhint.com (104.18.7.55) are filtered
Too many fingerprints match this host to give specific OS details

OS detection performed. Please report any incorrect results at https:/
/nmap.org/submit/ .
Nmap done: 1 IP address (1 host up) scanned in 6.64 seconds
```

```
cnlab404@cnlab404-Veriton-M200-H110:~$ sudo nmap -sA 10.0.2.15
Starting Nmap 7.80 ( https://nmap.org ) at 2023-03-10 09:53 IST
Nmap scan report for 10.0.2.15
Host is up (0.0021s latency).
Not shown: 999 unfiltered ports
PORT     STATE    SERVICE
5862/tcp filtered unknown

Nmap done: 1 IP address (1 host up) scanned in 1.43 seconds
```

```
cnlab404@cnlab404-Veriton-M200-H110:~$ sudo nmap -sP 10.0.2.*
Starting Nmap 7.80 ( https://nmap.org ) at 2023-03-10 09:55 IST
Nmap scan report for 10.0.2.0
Host is up (0.00012s latency).
Nmap scan report for 10.0.2.1
Host is up (0.00036s latency).
Nmap scan report for 10.0.2.2
Host is up (0.00025s latency).
Nmap scan report for 10.0.2.3
Host is up (0.00012s latency).
Nmap scan report for 10.0.2.4
Host is up (0.00016s latency).
Nmap scan report for 10.0.2.5
Host is up (0.00019s latency).
Nmap scan report for 10.0.2.6
Host is up (0.00013s latency).
Nmap scan report for 10.0.2.7
Host is up (0.00017s latency).
Nmap scan report for 10.0.2.8
Host is up (0.00017s latency).
Nmap scan report for 10.0.2.9
Host is up (0.00016s latency).
Nmap scan report for 10.0.2.10
Host is up (0.00015s latency).
Nmap scan report for 10.0.2.11
Host is up (0.00014s latency).
Nmap scan report for 10.0.2.12
Host is up (0.00015s latency).
Nmap scan report for 10.0.2.13
Host is up (0.00014s latency).
Nmap scan report for 10.0.2.14
Host is up (0.00014s latency).
Nmap scan report for 10.0.2.15
Host is up (0.00013s latency).
Nmap scan report for 10.0.2.16
Host is up (0.00015s latency).
Nmap scan report for 10.0.2.17
```

```
cnlab404@cnlab404-Veriton-M200-H110:~$ sudo nmap -V
Nmap version 7.80 ( https://nmap.org )
Platform: x86_64-pc-linux-gnu
Compiled with: liblua-5.3.3 openssl-1.1.1d nmap-libssh2-1.8.2 libz-1.2
.11 libpcre-8.39 libpcap-1.9.1 nmap-libdnet-1.12 ipv6
Compiled without:
Available nsock engines: epoll poll select
```

```
cnlab404@cnlab404-Veriton-M200-H110:~$ sudo nmap --iflist
Starting Nmap 7.80 ( https://nmap.org ) at 2023-03-10 10:04 IST
************************INTERFACES************************
DEV    (SHORT)  IP/MASK                     TYPE     UP MTU   MAC
lo     (lo)     127.0.0.1/8                 loopback up 65536
enp1s0 (enp1s0) 172.16.41.40/24             ethernet up 1500  F4:4D:3
0:4E:D5:82
enp1s0 (enp1s0) fe80::b728:152d:4e2c:88ac/64 ethernet up 1500  F4:4D:3
0:4E:D5:82

*************************ROUTES*************************
DST/MASK                      DEV    METRIC GATEWAY
172.16.41.0/24                enp1s0 100
169.254.0.0/16                enp1s0 1000
0.0.0.0/0                     enp1s0 100    172.16.41.1
fe80::b728:152d:4e2c:88ac/128 enp1s0 0
fe80::/64                     enp1s0 100
ff00::/8                      enp1s0 256
```

```
cnlab404@cnlab404-Veriton-M200-H110:~$ sudo nmap -p 80 linuxhint.com
Starting Nmap 7.80 ( https://nmap.org ) at 2023-03-10 10:05 IST
Nmap scan report for linuxhint.com (104.18.7.55)
Host is up (0.00063s latency).
Other addresses for linuxhint.com (not scanned): 104.18.6.55 2606:4700
::6812:637 2606:4700::6812:737

PORT   STATE SERVICE
80/tcp open  http

Nmap done: 1 IP address (1 host up) scanned in 0.21 seconds
```

```
cnlab404@cnlab404-Veriton-M200-H110:~$ sudo nmap 8.8.8.8
Starting Nmap 7.80 ( https://nmap.org ) at 2023-03-10 10:05 IST
Nmap scan report for dns.google (8.8.8.8)
Host is up (0.00059s latency).
Not shown: 998 filtered ports
PORT    STATE SERVICE
53/tcp  open  domain
443/tcp open  https

Nmap done: 1 IP address (1 host up) scanned in 4.72 seconds
cnlab404@cnlab404-Veriton-M200-H110:~$ sudo nmap -sU 8.8.8.8
Starting Nmap 7.80 ( https://nmap.org ) at 2023-03-10 10:06 IST
Nmap scan report for dns.google (8.8.8.8)
Host is up (0.00060s latency).
Not shown: 999 open|filtered ports
PORT   STATE SERVICE
53/udp open  domain

Nmap done: 1 IP address (1 host up) scanned in 4.20 seconds
```

```
cnlab404@cnlab404-Veriton-M200-H110:~$ sudo nmap -sT 10.0.2.15
Starting Nmap 7.80 ( https://nmap.org ) at 2023-03-10 10:07 IST
Nmap scan report for 10.0.2.15
Host is up (0.00016s latency).
All 1000 scanned ports on 10.0.2.15 are filtered

Nmap done: 1 IP address (1 host up) scanned in 21.18 seconds
cnlab404@cnlab404-Veriton-M200-H110:~$
```

Conclusion: -	Successfully understood the use of the network monitoring utility nmap. Also, learned about various commands that can help in diagnosing security issues and also finding hosts and free ports.