Section – A

1) -sS: perform TCP-SYN scan

```
shankar@shankar-ThinkPad-L450:~$ sudo nmap -sS 192.168.1.5
Starting Nmap 7.91 ( https://nmap.org ) at 2020-12-27 18:41 IST
Nmap scan report for shankar-ThinkPad-L450 (192.168.1.5)
Host is up (0.0000070s latency).
Not shown: 998 closed ports
PORT     STATE SERVICE
22/tcp   open  ssh
3128/tcp open  squid-http

Nmap done: 1 IP address (1 host up) scanned in 0.28 seconds
```

2) -sV -p ssl-heartbleed: Probe open ports to determine service/version info,

check port for heartbleed vulnerability

```
shankar@shankar-ThinkPad-L450:~$ nmap -sV -p 443 --script=ssl-heartbleed $ipaddr
Starting Nmap 7.91 ( https://nmap.org ) at 2020-12-27 18:44 IST
Nmap scan report for ec2-18-192-172-30.eu-central-1.compute.amazonaws.com (18.192.172.30)
Host is up (0.14s latency).

PORT    STATE    SERVICE VERSION
443/tcp filtered https

Service detection performed. Please report any incorrect results at https://nmap.org/submit/ .
Nmap done: 1 IP address (1 host up) scanned in 2.08 seconds
```

3) -sV: Probe open ports to determine service/version info

```
shankar@shankar-ThinkPad-L450:~$ nmap -sV $ipaddr
Starting Nmap 7.91 ( https://nmap.org ) at 2020-12-27 18:46 IST
Nmap scan report for ec2-18-192-172-30.eu-central-1.compute.amazonaws.com (18.192.172.30)
Host is up (0.14s latency).
Not shown: 999 filtered ports
PORT   STATE SERVICE VERSION
80/tcp open  http    nginx 1.19.0

Service detection performed. Please report any incorrect results at https://nmap.org/submit/ .
Nmap done: 1 IP address (1 host up) scanned in 19.19 seconds
```

4) -v: Increase verbosity level

```
shankar@shankar-ThinkPad-L450:~$ nmap -v $ipaddr
Starting Nmap 7.91 ( https://nmap.org ) at 2020-12-27 18:48 IST
Initiating Ping Scan at 18:48
Scanning 18.192.172.30 [2 ports]
Completed Ping Scan at 18:48, 0.15s elapsed (1 total hosts)
Initiating Parallel DNS resolution of 1 host. at 18:48
Completed Parallel DNS resolution of 1 host. at 18:48, 0.00s elapsed
Initiating Connect Scan at 18:48
Scanning ec2-18-192-172-30.eu-central-1.compute.amazonaws.com (18.192.172.30) [1000 ports]
Discovered open port 80/tcp on 18.192.172.30
Completed Connect Scan at 18:48, 11.35s elapsed (1000 total ports)
Nmap scan report for ec2-18-192-172-30.eu-central-1.compute.amazonaws.com (18.192.172.30)
Host is up (0.15s latency).
Not shown: 999 filtered ports
PORT   STATE SERVICE
80/tcp open  http

Read data files from: /usr/bin/../share/nmap
Nmap done: 1 IP address (1 host up) scanned in 11.66 seconds
```

5) website: scans a particular website

```
shankar@shankar-ThinkPad-L450:~$ nmap www.vit.ac.in
Starting Nmap 7.91 ( https://nmap.org ) at 2020-12-27 18:49 IST
Nmap scan report for www.vit.ac.in (136.233.9.13)
Host is up (0.071s latency).
rDNS record for 136.233.9.13: 136.233.9.13.static.jio.com
Not shown: 989 closed ports
PORT     STATE    SERVICE
53/tcp   filtered domain
80/tcp   open     http
135/tcp  filtered msrpc
139/tcp  filtered netbios-ssn
443/tcp  open     https
445/tcp  filtered microsoft-ds
515/tcp  filtered printer
1022/tcp filtered exp2
1023/tcp filtered netvenuechat
1026/tcp filtered LSA-or-nterm
9898/tcp filtered monkeycom

Nmap done: 1 IP address (1 host up) scanned in 3.66 seconds
```

6) -sT: TCP connect scan

```
shankar@shankar-ThinkPad-L450:~$ nmap -sT $ipaddr
Starting Nmap 7.91 ( https://nmap.org ) at 2020-12-27 18:50 IST
Nmap scan report for ec2-18-192-172-30.eu-central-1.compute.amazonaws.com (18.192.172.30)
Host is up (0.15s latency).
Not shown: 999 filtered ports
PORT   STATE SERVICE
80/tcp open  http

Nmap done: 1 IP address (1 host up) scanned in 11.39 seconds
```

7) --script http-tittle: obtains the title of the root path of web sites

```
shankar@shankar-ThinkPad-L450:~$ nmap --script http-title $ipaddr
Starting Nmap 7.91 ( https://nmap.org ) at 2020-12-27 18:52 IST
Stats: 0:00:00 elapsed; 0 hosts completed (0 up), 1 undergoing Ping Scan
Ping Scan Timing: About 100.00% done; ETC: 18:52 (0:00:00 remaining)
Nmap scan report for ec2-18-192-172-30.eu-central-1.compute.amazonaws.com (18.192.172.30)
Host is up (0.15s latency).
Not shown: 999 filtered ports
PORT   STATE SERVICE
80/tcp open  http
|_http-title: Home of Acunetix Art

Nmap done: 1 IP address (1 host up) scanned in 12.21 seconds
```

8) --script http-headers:

```
shankar@shankar-ThinkPad-L450:~$ nmap --script http-headers $ipaddr
Starting Nmap 7.91 ( https://nmap.org ) at 2020-12-27 18:52 IST
Stats: 0:00:00 elapsed; 0 hosts completed (0 up), 1 undergoing Ping Scan
Ping Scan Timing: About 100.00% done; ETC: 18:52 (0:00:00 remaining)
Nmap scan report for ec2-18-192-172-30.eu-central-1.compute.amazonaws.com (18.192.172.30)
Host is up (0.14s latency).
Not shown: 999 filtered ports
PORT   STATE SERVICE
80/tcp open  http
| http-headers:
|   Server: nginx/1.19.0
|   Date: Sun, 27 Dec 2020 13:22:50 GMT
|   Content-Type: text/html; charset=UTF-8
|   Connection: close
|   X-Powered-By: PHP/5.6.40-38+ubuntu20.04.1+deb.sury.org+1
|
|_  (Request type: HEAD)

Nmap done: 1 IP address (1 host up) scanned in 12.23 seconds
```

9) --script http-enum: effectively brute forces a web server path in order to discover web applications in use

```
shankar@shankar-ThinkPad-L450:~$ nmap --script http-enum $ipaddr
Starting Nmap 7.91 ( https://nmap.org ) at 2020-12-27 18:56 IST
Nmap scan report for ec2-18-192-172-30.eu-central-1.compute.amazonaws.com (18.192.172.30)
Host is up (0.14s latency).
Not shown: 999 filtered ports
PORT   STATE SERVICE
80/tcp open  http
| http-enum:
|   /admin/: Possible admin folder
|   /login.php: Possible admin folder
|   /clientaccesspolicy.xml: Microsoft Silverlight crossdomain policy
|   /crossdomain.xml: Adobe Flash crossdomain policy
|   /CVS/: Potentially interesting folder w/ directory listing
|   /images/: Potentially interesting folder w/ directory listing
|   /pictures/: Potentially interesting folder w/ directory listing
|_  /secured/: Potentially interesting folder

Nmap done: 1 IP address (1 host up) scanned in 317.78 seconds
```

10) -p: check ports

```
shankar@shankar-ThinkPad-L450:~$ nmap -p 80,443 $ipaddr
Starting Nmap 7.91 ( https://nmap.org ) at 2020-12-27 18:54 IST
Nmap scan report for ec2-18-192-172-30.eu-central-1.compute.amazonaws.com (18.192.172.30)
Host is up (0.14s latency).

PORT    STATE    SERVICE
80/tcp  open     http
443/tcp filtered https

Nmap done: 1 IP address (1 host up) scanned in 2.40 seconds
```

11) -p T: check ports for a time duration

```
shankar@shankar-ThinkPad-L450:~$ nmap -p T:8888,443 $ipaddr
Starting Nmap 7.91 ( https://nmap.org ) at 2020-12-27 18:55 IST
Nmap scan report for ec2-18-192-172-30.eu-central-1.compute.amazonaws.com (18.192.172.30)
Host is up (0.14s latency).

PORT     STATE    SERVICE
443/tcp  filtered https
8888/tcp filtered sun-answerbook

Nmap done: 1 IP address (1 host up) scanned in 2.68 seconds
```

12) --iflist: Print host interfaces and routes

```
shankar@shankar-ThinkPad-L450:~$ nmap --iflist
Starting Nmap 7.91 ( https://nmap.org ) at 2020-12-27 18:55 IST
************************INTERFACES************************
DEV     (SHORT)   IP/MASK                                  TYPE     UP   MTU   MAC
lo      (lo)      127.0.0.1/8                              loopback up   65536
lo      (lo)      ::1/128                                  loopback up   65536
enp0s25 (enp0s25) (none)/0                                 ethernet down 1500  68:F7:28:A8:02:C3
wlp4s0  (wlp4s0)  192.168.1.5/24                           ethernet up   1500  60:57:18:D7:D5:E8
wlp4s0  (wlp4s0)  fd1c:6758:7368:9a00:633b:85a2:165d:644e/64 ethernet up   1500  60:57:18:D7:D5:E8
wlp4s0  (wlp4s0)  fe80::626c:1a2b:1090:fb9c/64             ethernet up   1500  60:57:18:D7:D5:E8
wlp4s0  (wlp4s0)  fd1c:6758:7368:9a00:66d5:7c1d:dabd:5b3b/64 ethernet up   1500  60:57:18:D7:D5:E8
anbox0  (anbox0)  192.168.250.1/24                         ethernet up   1500  6A:2D:6C:28:FD:88
anbox0  (anbox0)  fe80::682d:6cff:fe28:fd88/64             ethernet up   1500  6A:2D:6C:28:FD:88

*************************ROUTES*************************
DST/MASK                                    DEV    METRIC GATEWAY
192.168.250.0/24                            anbox0 0
192.168.1.0/24                              wlp4s0 600
169.254.0.0/16                              wlp4s0 1000
0.0.0.0/0                                   wlp4s0 600    192.168.1.1
::1/128                                     lo     0
fd1c:6758:7368:9a00:633b:85a2:165d:644e/128 wlp4s0 0
fd1c:6758:7368:9a00:66d5:7c1d:dabd:5b3b/128 wlp4s0 0
fe80::626c:1a2b:1090:fb9c/128               wlp4s0 0
fe80::682d:6cff:fe28:fd88/128               anbox0 0
::1/128                                     lo     256
fe80::/64                                   anbox0 256
fd1c:6758:7368:9a00::/64                    wlp4s0 600
fe80::/64                                   wlp4s0 600
ff00::/8                                    anbox0 256
ff00::/8                                    wlp4s0 256
```

13) -f: flag checks

```
shankar@shankar-ThinkPad-L450:~$ sudo nmap -f $ipaddr
Starting Nmap 7.91 ( https://nmap.org ) at 2020-12-27 18:57 IST
Nmap scan report for ec2-18-192-172-30.eu-central-1.compute.amazonaws.com (18.192.172.30)
Host is up (0.14s latency).
Not shown: 999 filtered ports
PORT   STATE SERVICE
80/tcp open  http

Nmap done: 1 IP address (1 host up) scanned in 11.06 seconds
```

14) -A: enables version detection among other things

```
shankar@shankar-ThinkPad-L450:~$ sudo nmap -A $ipaddr
Starting Nmap 7.91 ( https://nmap.org ) at 2020-12-27 18:57 IST
Nmap scan report for ec2-18-192-172-30.eu-central-1.compute.amazonaws.com (18.192.172.30)
Host is up (0.14s latency).
Not shown: 999 filtered ports
PORT   STATE SERVICE VERSION
80/tcp open  http    nginx 1.19.0
|_http-server-header: nginx/1.19.0
|_http-title: Home of Acunetix Art
Warning: OSScan results may be unreliable because we could not find at least 1 open and 1 closed port
Aggressive OS guesses: Crestron XPanel control system (90%), Linux 3.13 or 4.2 (88%), XBMCbuntu Frodo v12.2 (Linux 3.X) (88%), ASUS RT-N56U WAP (Linux
 3.4) (87%), Linux 3.1 (87%), Linux 3.16 (87%), Linux 3.2 (87%), HP P2000 G3 NAS device (87%), AXIS 210A or 211 Network Camera (Linux 2.6.17) (87%), O
penWrt 12.09-rc1 Attitude Adjustment (Linux 3.3 - 3.7) (86%)
No exact OS matches for host (test conditions non-ideal).
Network Distance: 28 hops

TRACEROUTE (using port 80/tcp)
HOP RTT       ADDRESS
1   15.75 ms  _gateway (192.168.1.1)
2   22.89 ms  abts-kk-dynamic-001.4.179.122.airtelbroadband.in (122.179.4.1)
3   22.73 ms  125.18.238.241
4   137.66 ms 116.119.55.246
5   135.43 ms 99.83.67.148
6   131.57 ms 150.222.96.1
7   145.35 ms 52.93.21.113
8   121.64 ms 99.83.67.148
9   158.92 ms 54.239.43.251
10  ... 27
28  139.87 ms ec2-18-192-172-30.eu-central-1.compute.amazonaws.com (18.192.172.30)

OS and Service detection performed. Please report any incorrect results at https://nmap.org/submit/ .
Nmap done: 1 IP address (1 host up) scanned in 41.57 seconds
```

15) -p [range]: checks a range of port nums

```
shankar@shankar-ThinkPad-L450:~$ nmap -p 1-65535 localhost
Starting Nmap 7.91 ( https://nmap.org ) at 2020-12-27 18:57 IST
Nmap scan report for localhost (127.0.0.1)
Host is up (0.000092s latency).
Not shown: 65527 closed ports
PORT      STATE SERVICE
22/tcp    open  ssh
631/tcp   open  ipp
1716/tcp  open  xmsg
3128/tcp  open  squid-http
6463/tcp  open  unknown
8388/tcp  open  unknown
9050/tcp  open  tor-socks
40399/tcp open  unknown

Nmap done: 1 IP address (1 host up) scanned in 2.90 seconds
```

16) --top-ports: most accessed ports

```
shankar@shankar-ThinkPad-L450:~$ nmap --top-ports 20 $ipaddr
Starting Nmap 7.91 ( https://nmap.org ) at 2020-12-27 18:59 IST
Nmap scan report for ec2-18-192-172-30.eu-central-1.compute.amazonaws.com (18.192.172.30)
Host is up (0.14s latency).

PORT     STATE    SERVICE
21/tcp   filtered ftp
22/tcp   filtered ssh
23/tcp   filtered telnet
25/tcp   filtered smtp
53/tcp   filtered domain
80/tcp   open     http
110/tcp  filtered pop3
111/tcp  filtered rpcbind
135/tcp  filtered msrpc
139/tcp  filtered netbios-ssn
143/tcp  filtered imap
443/tcp  filtered https
445/tcp  filtered microsoft-ds
993/tcp  filtered imaps
995/tcp  filtered pop3s
1723/tcp filtered pptp
3306/tcp filtered mysql
3389/tcp filtered ms-wbt-server
5900/tcp filtered vnc
8080/tcp filtered http-proxy

Nmap done: 1 IP address (1 host up) scanned in 3.42 seconds
```

17) -T4 –A: speed check and enables version detection

```
shankar@shankar-ThinkPad-L450:~$ nmap -T4 -A cloudflare.com
Starting Nmap 7.91 ( https://nmap.org ) at 2020-12-27 19:00 IST
Nmap scan report for cloudflare.com (104.16.133.229)
Host is up (0.016s latency).
Other addresses for cloudflare.com (not scanned): 104.16.132.229 2606:4700::6810:84e5 2606:4700::6810:85e5
Not shown: 996 filtered ports
PORT     STATE SERVICE  VERSION
80/tcp   open  http     Cloudflare http proxy
|_http-server-header: cloudflare
|_http-title: Did not follow redirect to https://www.cloudflare.com/
443/tcp  open  ssl/http Cloudflare http proxy
|_http-server-header: cloudflare
|_http-title: Did not follow redirect to https://www.cloudflare.com/
| ssl-cert: Subject: commonName=cloudflare.com/organizationName=Cloudflare, Inc./stateOrProvinceName=CA/countryName=US
| Subject Alternative Name: DNS:*.cloudflare.com, DNS:cloudflare.com, DNS:*.dns.cloudflare.com, DNS:*.amp.cloudflare.com, DNS:*.staging.cloudflare.com
| Not valid before: 2020-07-04T00:00:00
|_Not valid after:  2021-07-04T12:00:00
|_ssl-date: 2020-12-27T13:30:37+00:00; 0s from scanner time.
| tls-alpn:
|   h2
|_  http/1.1
| tls-nextprotoneg:
|   h2
|_  http/1.1
8080/tcp open  http     Cloudflare http proxy
|_http-server-header: cloudflare
|_http-title: Did not follow redirect to https://www.cloudflare.com/
8443/tcp open  ssl/http Cloudflare http proxy
|_http-server-header: cloudflare
|_http-title: Did not follow redirect to https://www.cloudflare.com/
| ssl-cert: Subject: commonName=cloudflare.com/organizationName=Cloudflare, Inc./stateOrProvinceName=CA/countryName=US
| Subject Alternative Name: DNS:*.cloudflare.com, DNS:cloudflare.com, DNS:*.dns.cloudflare.com, DNS:*.amp.cloudflare.com, DNS:*.staging.cloudflare.com
| Not valid before: 2020-07-04T00:00:00
|_Not valid after:  2021-07-04T12:00:00
|_ssl-date: 2020-12-27T13:30:37+00:00; 0s from scanner time.
| tls-alpn:
|   h2
|_  http/1.1
| tls-nextprotoneg:
|   h2
|_  http/1.1
```

18) -Pn –script vuln: Treat all hosts as online

```
shankar@shankar-ThinkPad-L450:~$ nmap -Pn --script vuln $ipaddr
Host discovery disabled (-Pn). All addresses will be marked 'up' and scan times will be slower.
Starting Nmap 7.91 ( https://nmap.org ) at 2020-12-27 19:00 IST
Nmap scan report for ec2-18-192-172-30.eu-central-1.compute.amazonaws.com (18.192.172.30)
Host is up (0.14s latency).
Not shown: 999 filtered ports
```

19) -sV –script: check for version and for vulnerability

```
shankar@shankar-ThinkPad-L450:~$ nmap -sV --script http-malware-host $ipaddr
Starting Nmap 7.91 ( https://nmap.org ) at 2020-12-27 19:04 IST
Nmap scan report for ec2-18-192-172-30.eu-central-1.compute.amazonaws.com (18.192.172.30)
Host is up (0.14s latency).
Not shown: 999 filtered ports
PORT   STATE SERVICE VERSION
80/tcp open  http    nginx 1.19.0
|_http-malware-host: Host appears to be clean
|_http-server-header: nginx/1.19.0

Service detection performed. Please report any incorrect results at https://nmap.org/submit/ .
Nmap done: 1 IP address (1 host up) scanned in 18.86 seconds
```

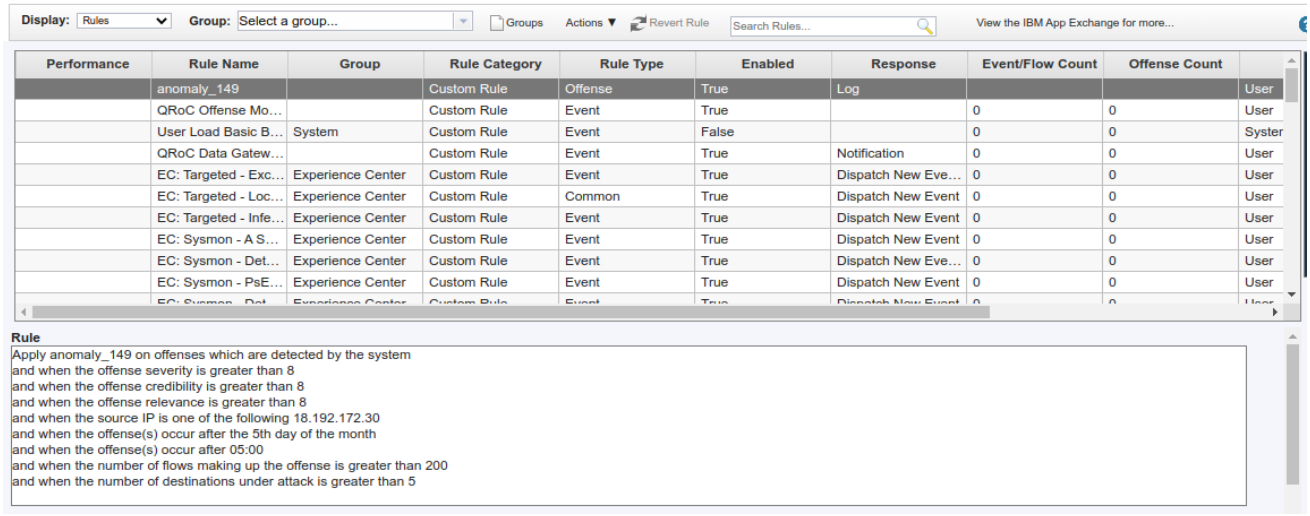
1) Use of > as a stream modifier between the command and the destination file.

Usage: command > output.txt

2) To scan ipv6 use the parameter (-6).

Usage: nmap –6 –rest of command

Section-B


Display: Rules
Group: Select a group...
Groups
Actions
Revert Rule
Search Rules...
View the IBM App Exchange for more...
Performance
Rule Name
Group
Rule Category
Rule Type
Enabled
Response
Event/Flow Count
Offense Count
anomaly_149 Custom Rule Offense True Log User
QRoC Offense Mo... Custom Rule Event True 0 0 User
User Load Basic B... System Custom Rule Event False 0 0 Syster
QRoC Data Gatew... Custom Rule Event True Notification 0 0 User
EC: Targeted - Exc... Experience Center Custom Rule Event True Dispatch New Eve... 0 0 User
EC: Targeted - Loc... Experience Center Custom Rule Common True Dispatch New Event 0 0 User
EC: Targeted - Infe... Experience Center Custom Rule Event True Dispatch New Event 0 0 User
EC: Sysmon - A S... Experience Center Custom Rule Event True Dispatch New Event 0 0 User
EC: Sysmon - Det... Experience Center Custom Rule Event True Dispatch New Eve... 0 0 User
EC: Sysmon - PsE... Experience Center Custom Rule Event True Dispatch New Event 0 0 User
Rule
Apply anomaly_149 on offenses which are detected by the system
and when the offense severity is greater than 8
and when the offense credibility is greater than 8
and when the offense relevance is greater than 8
and when the source IP is one of the following 18.192.172.30
and when the offense(s) occur after the 5th day of the month
and when the offense(s) occur after 05:00
and when the number of flows making up the offense is greater than 200
and when the number of destinations under attack is greater than 5