

# Information gathering and Scanning Tools

## Ping:

Ping is a utility used to send out **ICMP** packets to an address to see how fast the response is (check if the host exists). Ping is important when it comes to website **latency** as it corresponds with the delay time (in milliseconds) for how long it takes the data to travel across the internet, to its destination address, and then back to you.

#ping domain name

#ping ip address

## Nslookup:

DNS lookup tool is to find the IP address of a certain domain name. The results will include the IP addresses in the DNS records received from the name servers.

#nslookup domain name

## Traceroute:

A traceroute is a network tool used to show the route taken by packets across an IP network.

The Traceroute tool will show you each hop sequentially, and total hops required. For each hop, it will display the hop #, roundtrip times, best time (ms), IP address, TTL, and country.

#traceroute domain name

```
prabhakar@Inspiron-3542:~$ traceroute google.com
traceroute to google.com (172.217.26.206), 30 hops max, 60 byte packets
 1  192.168.43.45 (192.168.43.45)  2.014 ms  2.313 ms  2.588 ms
 2  * * *
 3  10.45.1.230 (10.45.1.230)  75.449 ms  115.244 ms  115.224 ms
 4  10.45.8.178 (10.45.8.178)  93.856 ms  115.138 ms  93.822 ms
 5  10.45.8.187 (10.45.8.187)  115.116 ms  115.106 ms  115.070 ms
 6  * * *
 7  218.248.235.141 (218.248.235.141)  120.589 ms  108.033 ms  106.962 ms
 8  218.248.235.142 (218.248.235.142)  114.489 ms * *
 9  72.14.211.114 (72.14.211.114)  98.076 ms  93.232 ms  93.781 ms
10  108.170.253.113 (108.170.253.113)  98.688 ms  91.388 ms  108.170.253.97 (108.170.253.97)  107.241 ms
11  74.125.253.69 (74.125.253.69)  95.120 ms  72.14.237.165 (72.14.237.165)  102.594 ms  103.137 ms
12  maa03s23-in-f14.1e100.net (172.217.26.206)  101.794 ms  97.987 ms  97.165 ms
prabhakar@Inspiron-3542:~$
```

## Whois:

WHOIS (pronounced as the phrase "who is") is a query and response protocol that is widely used for querying databases that store the registered users or assignees of an Internet resource, such as a domain name,

an IP address block or an autonomous system, but is also used for a wider range of other information. The protocol stores and delivers database content in a human-readable format.

#whois domain name

#whois ip adress

## WHOIS search results

Domain Name: GOOGLE.COM  
Registry Domain ID: 2138514\_DOMAIN\_COM-VRSN  
Registrar WHOIS Server: whois.markmonitor.com  
Registrar URL: <http://www.markmonitor.com>  
Updated Date: 2019-09-09T15:39:04Z  
Creation Date: 1997-09-15T04:00:00Z  
Registry Expiry Date: 2028-09-14T04:00:00Z  
Registrar: MarkMonitor Inc.  
Registrar IANA ID: 292  
Registrar Abuse Contact Email: [abusecomplaints@markmonitor.com](mailto:abusecomplaints@markmonitor.com)  
Registrar Abuse Contact Phone: +1.2083895740  
Domain Status: clientDeleteProhibited  
<https://icann.org/epp#clientDeleteProhibited>  
Domain Status: clientTransferProhibited  
<https://icann.org/epp#clientTransferProhibited>  
Domain Status: clientUpdateProhibited  
<https://icann.org/epp#clientUpdateProhibited>  
Domain Status: serverDeleteProhibited  
<https://icann.org/epp#serverDeleteProhibited>  
Domain Status: serverTransferProhibited  
<https://icann.org/epp#serverTransferProhibited>  
Domain Status: serverUpdateProhibited  
<https://icann.org/epp#serverUpdateProhibited>  
Name Server: NS1.GOOGLE.COM  
Name Server: NS2.GOOGLE.COM  
Name Server: NS3.GOOGLE.COM  
Name Server: NS4.GOOGLE.COM  
DNSSEC: unsigned  
URL of the ICANN Whois Inaccuracy Complaint Form:  
<https://www.icann.org/wicf/>  
>>> Last update of whois database: 2020-08-23T17:25:42Z <<<

## The harvester tool:

The Harvester is a tool that was developed in python. Using this you can gather information like emails, subdomains, hosts, employee names, open ports and banners from different public sources like search engines, PGP key servers, and SHODAN computer database.

#theharvester -d [domain name] -l [no. Of searches] -b [search engine name / all ][options] [parameters]

#theharvester -d microsoft.com -l 500 -b google

#theharvester -d microsoft -l 200 -b linkedin

#theharvester -d microsoft.com -l 500 -b google -h myresults.html

```
root@test-kalbox:~# theharvester -h
*****
*
*
*  TheHarvester
*
*
* TheHarvester Ver. 2.6
* Coded by Christian Martorella
* Edge-Security Research
* cmartorella@edge-security.com
*
*****

Usage: theharvester options

-d: Domain to search or company name
-b: data source: google, googleCSE, bing, bingapi, pgp
    linkedin, google-profiles, people123, jigsaw,
    twitter, googleplus, all

-s: Start in result number X (default: 0)
-v: Verify host name via dns resolution and search for virtual hosts
-f: Save the results into an HTML and XML file
-n: Perform a DNS reverse query on all ranges discovered
-c: Perform a DNS brute force for the domain name
-t: Perform a DNS TLD expansion discovery
-e: Use this DNS server
-l: Limit the number of results to work with(bing goes from 50 to 50 results,
-h: use SHODAN database to query discovered hosts
    google 100 to 100, and pgp doesn't use this option)

Examples:
    theharvester -d microsoft.com -l 500 -b google
    theharvester -d microsoft.com -b pgp
```



- Retrieve possible uptime data, system and server data.
- Perform a SubDomain search on a target host.
- Perform an E-Mail address search on a target host.
- Perform a TCP Portscan on the host target.

```
# dmitry -h
```

```
# dmitry -winsepo [file_name.txt] [domain_name]
```

```
# dmitry -winsepo example.txt example.com
```

## hping3:

hping3 is another tool used for scan network. it is available in kali linux by default it is one of DOS attack software, ddos stand for distributed denial of service attack. you can launch and stop dos attack, whenever you want.

### A simple DOS (not DDOS) attack

```
#hping3 -S --flood -V -p 80 <ip address>
```

Where:

note:need rootprivileges to run hping3.

hping3: calls hping3 program.

-S: specifies SYN packets.

–flood: shoot at discretion, replies will be ignored (that’s why replies wont be shown) and packets will be sent fast as possible.

-V: Verbosity.

-p 80: port 80, you can replace this number for the service you want to attack.

### The following example portrays a SYN attack against lacampora.org:

```
#hping3 lacampora.org -q -n -d 120 -S -p 80 --flood --rand-source
```

Where:

Lacampora.org: is the target

-q: brief output

-n: show target IP instead of host.

-d 120: set packet size

–rand-source: hide IP address.

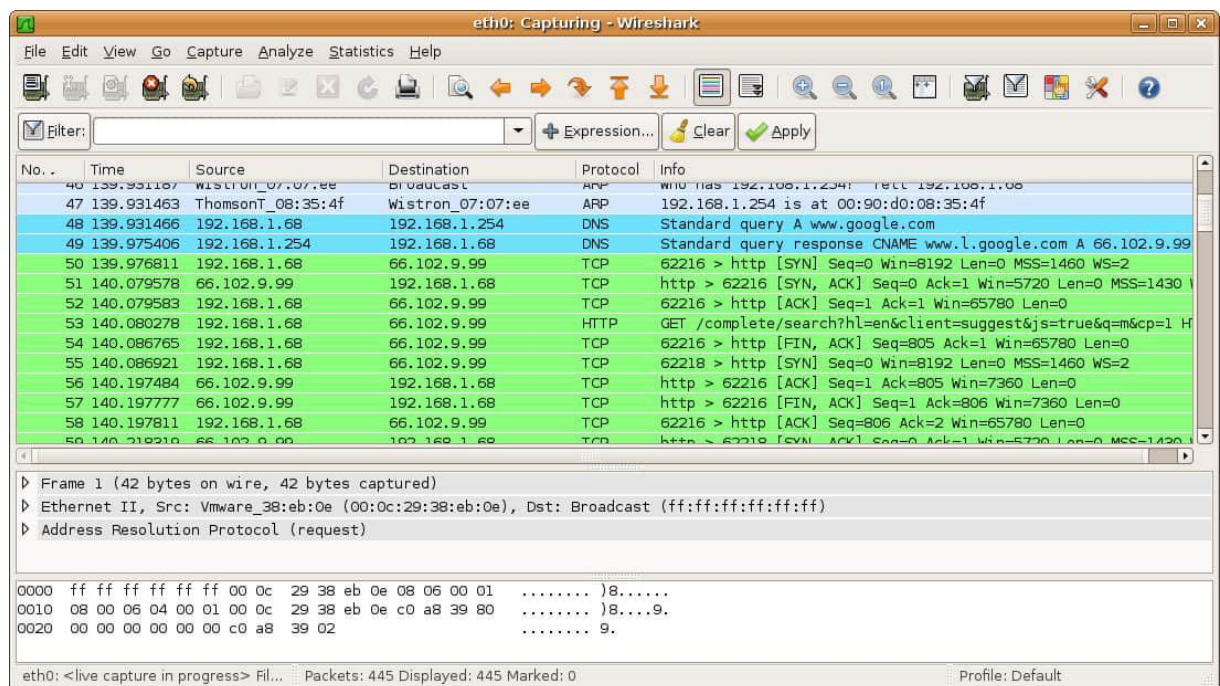
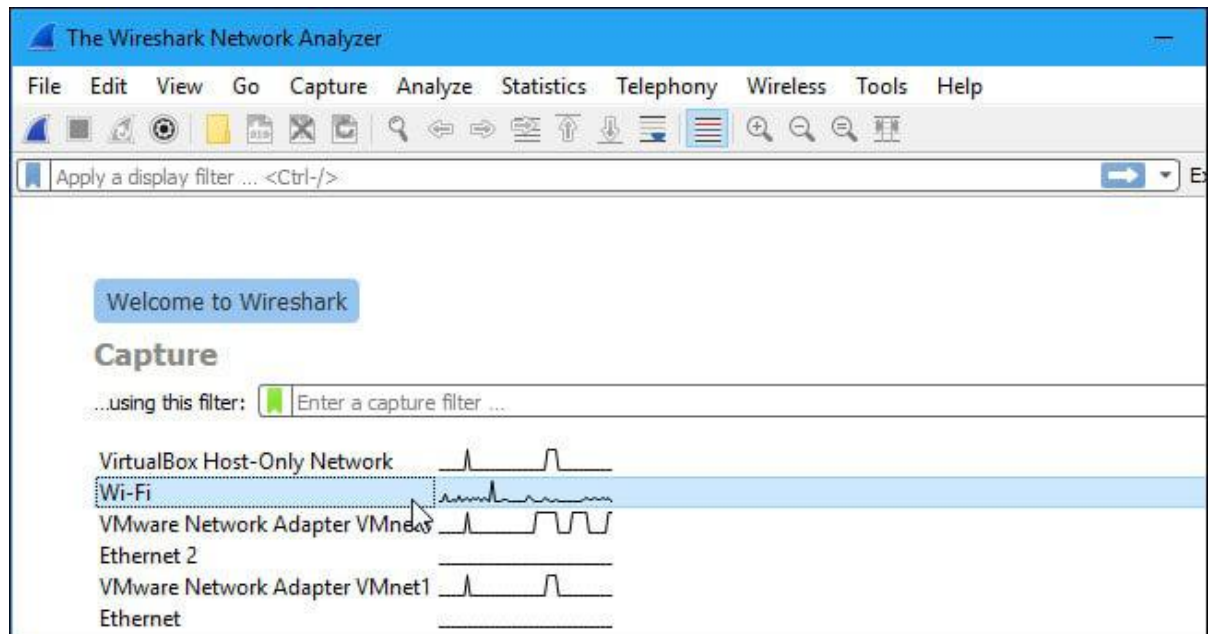
### SYN flood against port 80:

```
# sudo hping3 --rand-source ivan.com -S -q -p 80 --flood
```

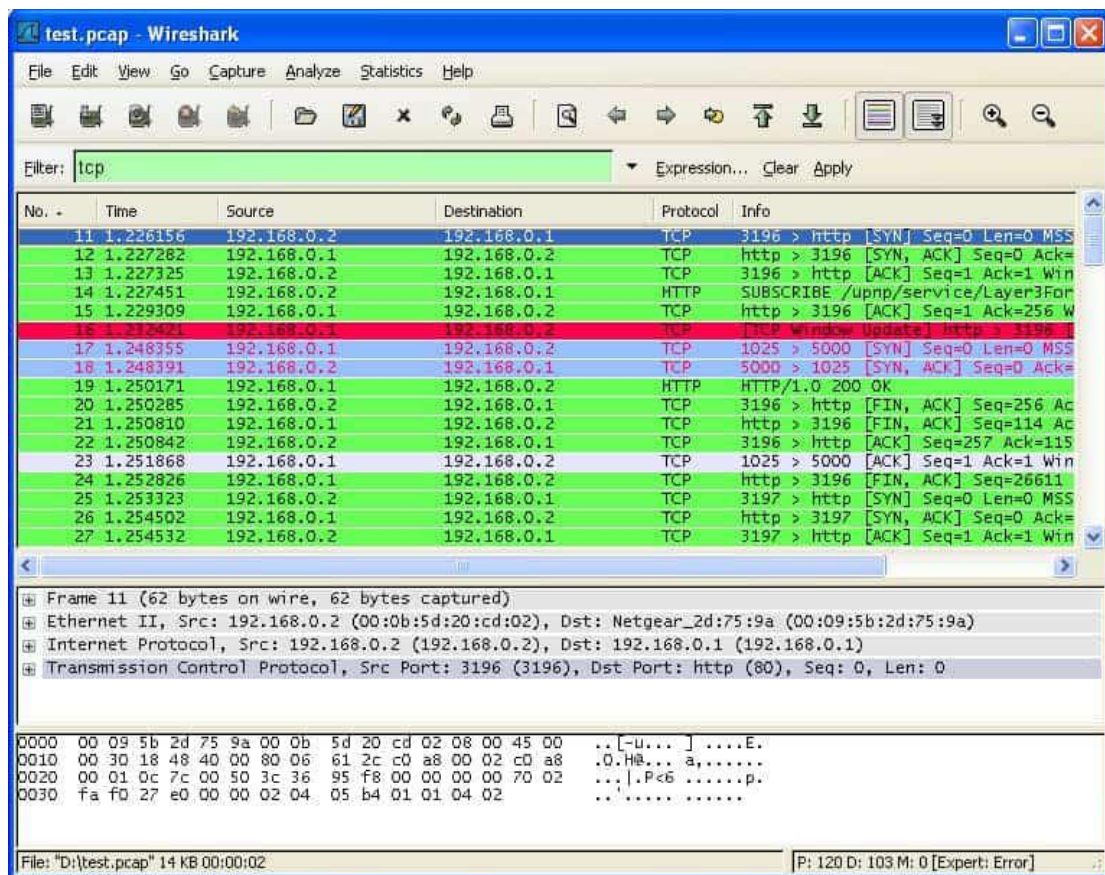


## Wireshark:

Wireshark is the world's foremost network protocol analyzer. It lets you see what's happening on your network at a microscopic level.



**Capture Filters** and **Display Filters** are two types of distinct filters that can be used on Wireshark. Capture Filters are used to reduce the size of incoming packet capture, essentially filtering out other packets during live packet capturing. As a result, capture filters are set before you begin the live capture process.



## Nmap:

Nmap (Network Mapper) is the leading security scanner, written in C/C++, it is useful to discover hosts, to map and scan networks, hosts and ports and by implementing the NSE (Nmap Scripting Engine) you can also detect vulnerabilities on your target

### Scan a single IP

#nmap ipaddress

```
root@EthicalHaks:~# nmap 192.168.0.9

Starting Nmap 7.12 ( https://nmap.org ) at 2016-07-19 08:19 PDT
Nmap scan report for 192.168.0.9
Host is up (0.0000030s latency).
Not shown: 999 closed ports
PORT      STATE SERVICE
111/tcp   open  rpcbind
Nmap done: 1 IP address (1 host up) scanned in 0.77 seconds
```

## Scan a host

**#nmap domain\_name**

```
root@EthicalHaks:~# nmap www.google.com

Starting Nmap 7.12 ( https://nmap.org ) at 2016-07-19 08:25 PDT
Nmap scan report for www.google.com (216.58.218.4)
Host is up (0.079s latency).
Other addresses for www.google.com (not scanned): 2607:f8b0:4012:805::2004
rDNS record for 216.58.218.4: atl14s39-in-f4.1e100.net
Not shown: 998 filtered ports
PORT      STATE SERVICE
80/tcp    open  http
443/tcp   open  https

Nmap done: 1 IP address (1 host up) scanned in 7.86 seconds
```

## Ping Scan

**# nmap -sp 192.100.1.1/24**

Scans the subnet for active hosts and displays the Physical address

```
root@kali:~# nmap
Nmap 6.40 ( http://nmap.org )
Usage: nmap [Scan Type(s)] [Options] {target specification}
TARGET SPECIFICATION:
  Can pass hostnames, IP addresses, networks, etc.
  Ex: scanme.nmap.org, microsoft.com/24, 192.168.0.1; 10.0.0-255.1-254
  -iL <inputfilename>: Input from list of hosts/networks
  -iR <num hosts>: Choose random targets
  --exclude <host1[,host2][,host3],...>: Exclude hosts/networks
  --excludefile <exclude_file>: Exclude list from file
HOST DISCOVERY:
  -sL: List Scan - simply list targets to scan
  -sn: Ping Scan - disable port scan
  -Pn: Treat all hosts as online -- skip host discovery
  -PS/PA/PY/PY[portlist]: TCP SYN/ACK, UDP or SCTP discovery to given ports
  -PE/PP/PM: ICMP echo, timestamp, and netmask request discovery probes
  -PO[protocol list]: IP Protocol Ping
  -n/-R: Never do DNS resolution/Always resolve [default: sometimes]
  --dns-servers <serv1[,serv2],...>: Specify custom DNS servers
  --system-dns: Use OS's DNS resolver
  --traceroute: Trace hop path to each host
SCAN TECHNIQUES:
  -sS/sT/sA/sW/sM: TCP SYN/Connect()/ACK/Window/Maimon scans
  -sU: UDP Scan
```

**#nmap <scantype> IP address**

## Scan for Specific Port or Port Range

**#nmap <IP address> -p25-150**



**#nmap 192.168.89.0/24 -p80**

## Evading Firewalls

**#nmap -sS -P0 <IP address>**

## Gathering Version Info

**#nmap -V <IP address>**

```
Try using --system-dns or specify valid servers with --dns-servers
Nmap scan report for 192.168.89.191
Host is up (0.0045s latency).
Not shown: 982 closed ports
PORT      STATE SERVICE      VERSION
21/tcp    open  ftp          Microsoft ftpd
25/tcp    open  smtp         Microsoft ESMT
53/tcp    open  domain      Microsoft DNS
80/tcp    open  http        Microsoft IIS httpd 6.0
110/tcp   open  pop3        Microsoft Windows 2003 POP3 Service 1.0
135/tcp   open  msrpc       Microsoft Windows RPC
139/tcp   open  netbios-ssn Microsoft Windows RPC
445/tcp   open  microsoft-ds Microsoft Windows 2003 or 2008 microsoft-ds
1025/tcp  open  msrpc       Microsoft Windows RPC
1026/tcp  open  msrpc       Microsoft Windows RPC
1027/tcp  open  msrpc       Microsoft Windows RPC
1030/tcp  open  msrpc       Microsoft Windows RPC
1033/tcp  open  msrpc       Microsoft Windows RPC
1034/tcp  open  msrpc       Microsoft Windows RPC
1035/tcp  open  msrpc       Microsoft Windows RPC
1433/tcp  open  ms-sql-s    Microsoft SQL Server 2000 8.00.766; SP3a
5800/tcp  open  http-proxy  sslstrip
5900/tcp  open  vnc         VNC (protocol 3.3)
MAC Address: 00:0C:29:18:6B:DB (VMware)
```

## UDP Scan

**nmap -sU <IP address>**

```

mass_dns: warning: Unable to determine any DNS servers. Reverse DNS is disabled.
Try using --system-dns or specify valid servers with --dns-servers
Nmap scan report for 192.168.89.191
Host is up (0.0012s latency).
Not shown: 986 closed ports
PORT      STATE      SERVICE
53/udp    open       domain
123/udp   open|filtered ntp
135/udp   open       msrpc
137/udp   open       netbios-ns
138/udp   open|filtered netbios-dgm
161/udp   open|filtered snmp
445/udp   open|filtered microsoft-ds
500/udp   open|filtered isakmp
1029/udp  open       solid-mux
1031/udp  open|filtered iad2
1036/udp  open       nsstp
1434/udp  open|filtered ms-sql-m
3456/udp  open|filtered IISrpc-or-vat
4500/udp  open|filtered nat-t-ike
MAC Address: 00:0C:29:18:6B:DB (VMware)

Nmap done: 1 IP address (1 host up) scanned in 1.43 seconds
root@kali:~#

```

**#nmap -sU --reason <IP address>**

```

Try using --system-dns or specify valid servers with --dns-servers
Nmap scan report for 192.168.89.191
Host is up, received arp-response (0.00080s latency).
Not shown: 986 closed ports
Reason: 986 port-unreaches
PORT      STATE      SERVICE      REASON
53/udp    open       domain       udp-response
123/udp   open|filtered ntp          no-response
135/udp   open       msrpc        udp-response
137/udp   open       netbios-ns   udp-response
138/udp   open|filtered netbios-dgm  no-response
161/udp   open|filtered snmp        no-response
445/udp   open|filtered microsoft-ds no-response
500/udp   open|filtered isakmp      no-response
1029/udp  open       solid-mux    udp-response
1031/udp  open|filtered iad2        no-response
1036/udp  open       nsstp        udp-response
1434/udp  open|filtered ms-sql-m    no-response
3456/udp  open|filtered IISrpc-or-vat no-response
4500/udp  open|filtered nat-t-ike    no-response
MAC Address: 00:0C:29:18:6B:DB (VMware)

Nmap done: 1 IP address (1 host up) scanned in 2.62 seconds
root@kali:~#

```

**OS detection(-O)**

**OS detection with verbosity (-O -v)**

```
C:\Nmap>nmap -O 192.168.10.252
```

```
Starting Nmap 4.76 ( http://nmap.org ) at 2010-04-24 14:20 Eastern Daylight Time
```

```
Interesting ports on 192.168.10.252:
```

```
Not shown: 987 closed ports
```

PORT	STATE	SERVICE
80/tcp	open	http
85/tcp	open	mit-ml-dev
135/tcp	open	msrpc
139/tcp	open	netbios-ssn
445/tcp	open	microsoft-ds
5357/tcp	open	unknown
49152/tcp	open	unknown
49153/tcp	open	unknown
49154/tcp	open	unknown
49155/tcp	open	unknown
49156/tcp	open	unknown
49157/tcp	open	unknown
49158/tcp	open	unknown

```
MAC Address: 00:0C:29:41:A3:2E (VMware)
```

```
No exact OS matches for host (If you know what OS is running on it, see http://nmap.org/submit/ ).
```

```
TCP/IP fingerprint:
```

```
OS:SCAN(U=4.76%D=4/24%OT=80%CT=1%CU=43019%PU=Y%DS=1%G=Y%M=000C29%TM=4BD3368
OS:2%P=i686-pc-windows-windows)SEQ(SP=101%GCD=1%ISR=109%TI=I%II=I%SS=S%TS=7
OS:>OPS(O1=M5B4NW8ST11%O2=M5B4NW8ST11%O3=M5B4NW8NNT11%O4=M5B4NW8ST11%O5=M5B
OS:4NW8ST11%O6=M5B4ST11)WIN(W1=2000%W2=2000%W3=2000%W4=2000%W5=2000%W6=2000
OS:>ECN(R=Y%DF=Y%T=81%W=2000%O=M5B4NW8NNS%CC=N%Q=>T1(R=Y%DF=Y%T=81%S=O%A=S+
OS:%F=A%RD=0%Q=>T2(R=Y%DF=Y%T=81%W=0%S=Z%A=S%F=AR%O=%RD=0%Q=>T3(R=Y%DF=Y%T
OS:=81%W=0%S=Z%A=O%F=AR%O=%RD=0%Q=>T4(R=Y%DF=Y%T=81%W=0%S=A%A=O%F=R%O=%RD=0
OS:%Q=>T5(R=Y%DF=Y%T=81%W=0%S=Z%A=S+%F=AR%O=%RD=0%Q=>T6(R=Y%DF=Y%T=81%W=0%S
OS:=A%A=O%F=R%O=%RD=0%Q=>T6(R=Y%DF=Y%T=81%W=0%S=O%A=O%F=R%O=%RD=0%Q=>T7(R=Y
OS:%DF=Y%T=81%W=0%S=Z%A=S+%F=AR%O=%RD=0%Q=>T7(R=Y%DF=Y%T=81%W=0%S=Z%A=O%F=A
OS:R%O=%RD=0%Q=>U1(R=Y%DF=N%T=81%TOS=0%IPL=164%UN=0%RIPL=G%RID=G%RIPCK=G%RU
OS:CK=G%RUL=G%RUD=G)IE(R=Y%DFI=N%T=81%TOSI=Z%CD=Z%SI=S%DLI=S)
```

```
Network Distance: 1 hop
```

```
OS detection performed. Please report any incorrect results at http://nmap.org/submit/.
```

```
Nmap done: 1 IP address (1 host up) scanned in 27.00 seconds
```