W10D4 – Pratica

Epic Education Srl

Simulazione fase di raccolta informazioni pt. 2

(target Metasploitable)

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22/09/2025

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Sintesi esecutiva

Questo documento riassume i risultati delle scansioni condotte sulla macchina *Metasploitable* utilizzando diversi strumenti. L'obiettivo è identificare le porte aperte e i servizi esposti ma anche di capire le differenze dei risultati delle diverse tecniche adottate.

Perimetro

Il target prefissato è la macchina Metasploitable

Panoramica delle vulnerabilità

Sono state identificate le seguenti porte aperte con i relativi servizi

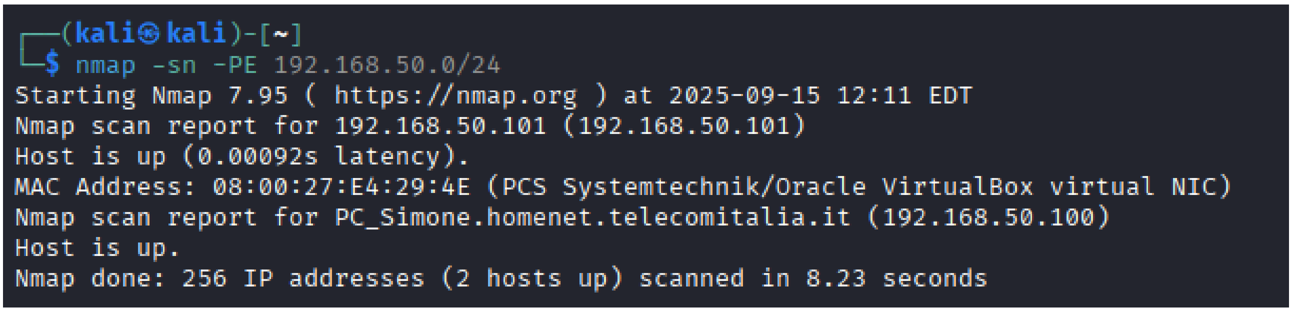
Port		Service
21	tcp	ftp
22	tcp	ssh
23	tcp	telnet
25	tcp	smtp
53	tcp	domain
80	tcp	http
111	tcp	rpcbind
139	tcp	netbios-ssn
445	tcp	netbios-ssn
512	tcp	exec
513	tcp	login
514	tcp	shell
1099	tcp	java-rmi
1524	tcp	bindshell
2049	tcp	nfs
2121	tcp	ccproxy-ftp
3306	tcp	mysql
5432	tcp	postgresql
5900	tcp	vnc
6000	tcp	X11
6667	tcp	irc
8009	tcp	ajp13
8180	tcp	http

Raccolta info Metasploitable

Nmap-sn-PE

-sn effettua un ping scan per verificare quali host sono attivi sulla rete
-PE specifica il tipo di ping ICMP Echo request da inviare, inviandolo rileverà se l’host risponde. Se risponde l’host è attivo.

Con il comando abbiamo eseguito un ping scan inviando ping echo request sulla rete 2 host: 192.168.50.100 (Kali) e 192.168.51.101 (Metasploitable).



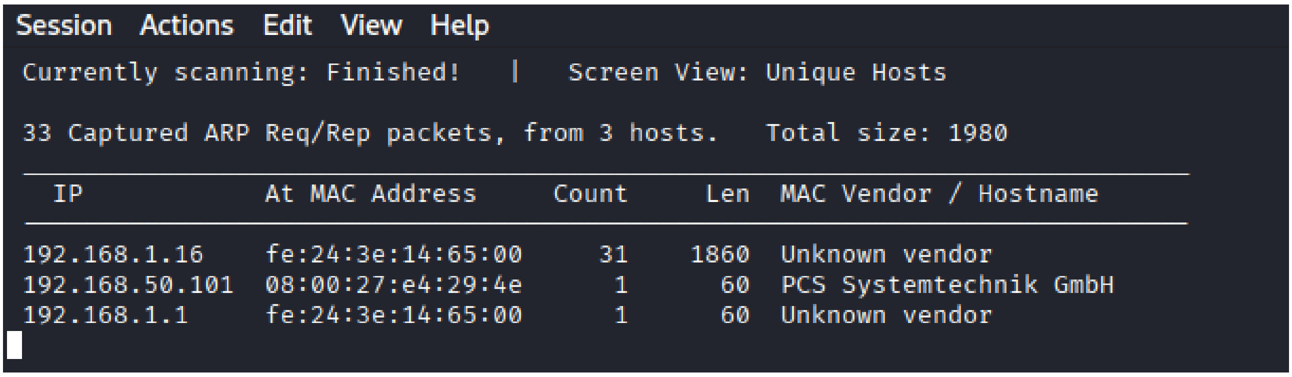
```
┌──(kali㉿kali)-[~]
└─$ nmap -sn -PE 192.168.50.0/24
Starting Nmap 7.95 ( https://nmap.org ) at 2025-09-15 12:11 EDT
Nmap scan report for 192.168.50.101 (192.168.50.101)
Host is up (0.00092s latency).
MAC Address: 08:00:27:E4:29:4E (PCS Systemtechnik/Oracle VirtualBox virtual NIC)
Nmap scan report for PC_Simone.homenet.telecomitalia.it (192.168.50.100)
Host is up.
Nmap done: 256 IP addresses (2 hosts up) scanned in 8.23 seconds
```

Netdiscover-r

sudo netdiscover -r 192.168.50.0/24

Netdiscover è uno strumento per **scoprire host nella rete locale** usando principalmente **pacchetti ARP**, -r indica il **range** (CIDR o intervallo) da scansionare

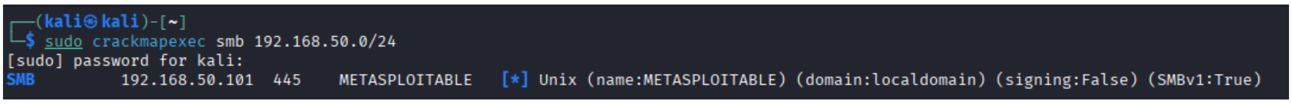
Nella nostra rete ha individuato la macchina Metasploitable 192.168.50.101



```
 Currently scanning: Finished!   |   Screen View: Unique Hosts

 33 Captured ARP Req/Rep packets, from 3 hosts.   Total size: 1980
 _____________________________________________________________________________
   IP            At MAC Address     Count     Len  MAC Vendor / Hostname
 -----------------------------------------------------------------------------
 192.168.1.16    fe:24:3e:14:65:00     31    1860  Unknown vendor
 192.168.50.101  08:00:27:e4:29:4e      1      60  PCS Systemtechnik GmbH
 192.168.1.1     fe:24:3e:14:65:00      1      60  Unknown vendor
```

Crackmapexec

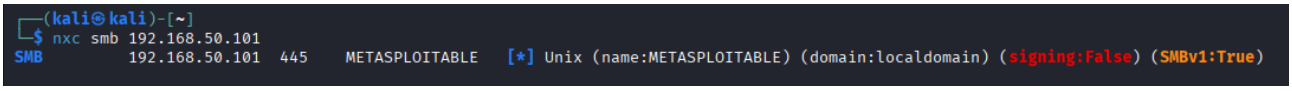
sudo crackmapexec smb 192.168.50.0/24
smb permette di fare una scansione semplice su tutta la subnet, in questo caso ha rilevato la macchina Metasploitable



```
┌──(kali㉿kali)-[~]
└─$ sudo crackmapexec smb 192.168.50.0/24
[sudo] password for kali:
SMB         192.168.50.101  445    METASPLOITABLE   [*] Unix (name:METASPLOITABLE) (domain:localdomain) (signing:False) (SMBv1:True)
```

NetExec

nxc smb 192.168.50.101

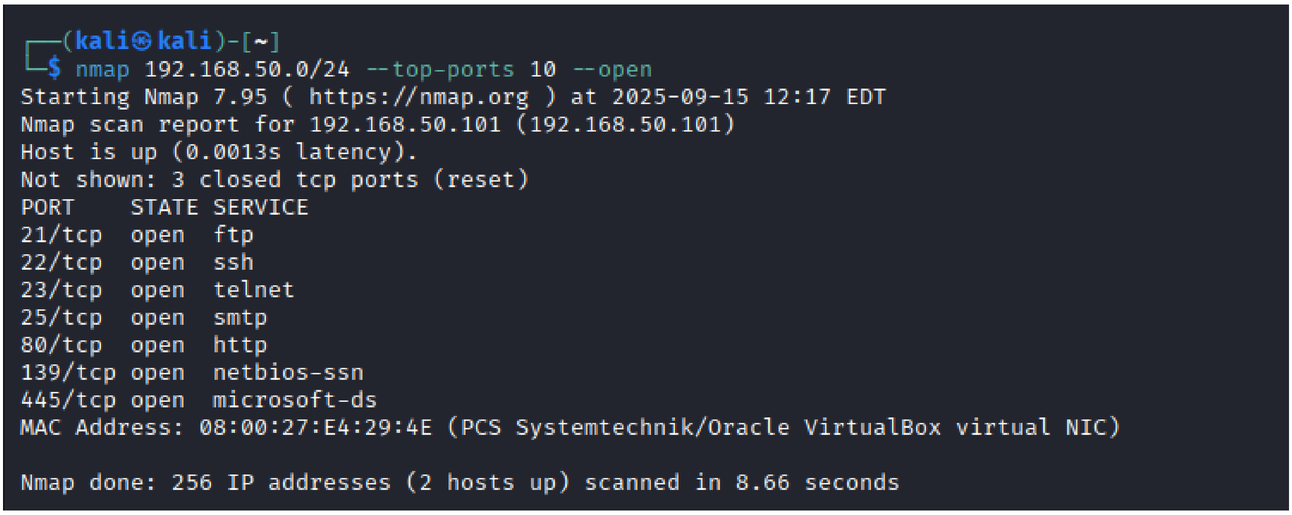


```
┌──(kali㉿kali)-[~]
└─$ nxc smb 192.168.50.101
SMB         192.168.50.101  445    METASPLOITABLE    [*] Unix (name:METASPLOITABLE) (domain:localdomain) (signing:False) (SMBv1:True)
```

nmap --top-ports --open

nmap 192.168.51.0/24 --top-ports 10 –open

--top-ports <N> dice a Nmap di scansionare **solo i N. (10) porte più comuni**, per una ricognizione rapida.
--open filtra l’output mostrando **solo le porte/host che risultano aperte/i**.

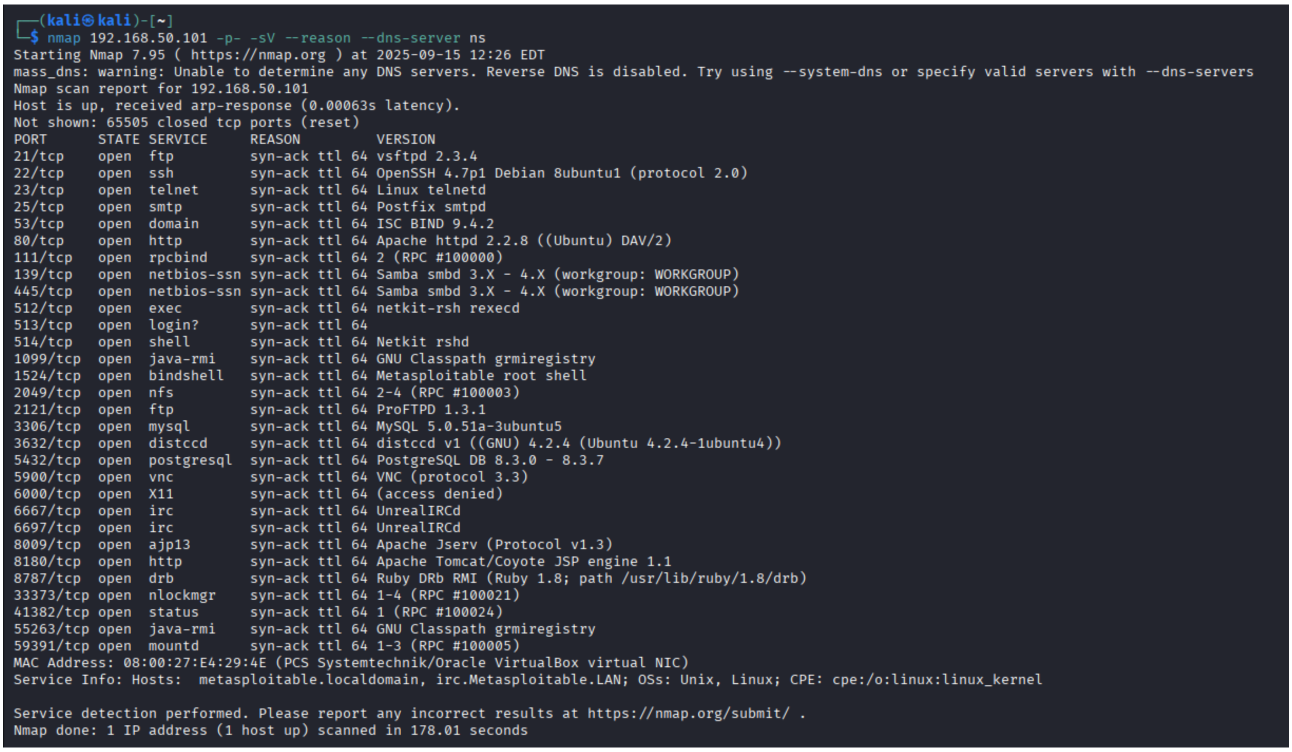


```
┌──(kali㉿kali)-[~]
└─$ nmap 192.168.50.0/24 --top-ports 10 --open
Starting Nmap 7.95 ( https://nmap.org ) at 2025-09-15 12:17 EDT
Nmap scan report for 192.168.50.101 (192.168.50.101)
Host is up (0.0013s latency).
Not shown: 3 closed tcp ports (reset)
PORT    STATE SERVICE
21/tcp  open  ftp
22/tcp  open  ssh
23/tcp  open  telnet
25/tcp  open  smtp
80/tcp  open  http
139/tcp open  netbios-ssn
445/tcp open  microsoft-ds
MAC Address: 08:00:27:E4:29:4E (PCS Systemtechnik/Oracle VirtualBox virtual NIC)

Nmap done: 256 IP addresses (2 hosts up) scanned in 8.66 seconds
```

nmap <IP>-p--sV--reason--dns-server ns

nmap 192.168.50.101 -p- -sV --reason --dns-server ns

--reason ci fornisce info sul tipo di pacchetto di risposta ricevuto (reason)



```
┌──(kali㉿kali)-[~]
└─$ nmap 192.168.50.101 -p- -sV --reason --dns-server ns
Starting Nmap 7.95 ( https://nmap.org ) at 2025-09-15 12:26 EDT
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 192.168.50.101
Host is up, received arp-response (0.00063s latency).
Not shown: 65505 closed tcp ports (reset)
PORT      STATE SERVICE     REASON         VERSION
21/tcp    open  ftp         syn-ack ttl 64 vsftpd 2.3.4
22/tcp    open  ssh         syn-ack ttl 64 OpenSSH 4.7p1 Debian 8ubuntu1 (protocol 2.0)
23/tcp    open  telnet      syn-ack ttl 64 Linux telnetd
25/tcp    open  smtp        syn-ack ttl 64 Postfix smtpd
53/tcp    open  domain      syn-ack ttl 64 ISC BIND 9.4.2
80/tcp    open  http        syn-ack ttl 64 Apache httpd 2.2.8 ((Ubuntu) DAV/2)
111/tcp   open  rpcbind     syn-ack ttl 64 2 (RPC #100000)
139/tcp   open  netbios-ssn syn-ack ttl 64 Samba smbd 3.X - 4.X (workgroup: WORKGROUP)
445/tcp   open  netbios-ssn syn-ack ttl 64 Samba smbd 3.X - 4.X (workgroup: WORKGROUP)
512/tcp   open  exec        syn-ack ttl 64 netkit-rsh rexecd
513/tcp   open  login?      syn-ack ttl 64
514/tcp   open  shell       syn-ack ttl 64 Netkit rshd
1099/tcp  open  java-rmi    syn-ack ttl 64 GNU Classpath grmiregistry
1524/tcp  open  bindshell   syn-ack ttl 64 Metasploitable root shell
2049/tcp  open  nfs         syn-ack ttl 64 2-4 (RPC #100003)
2121/tcp  open  ftp         syn-ack ttl 64 ProFTPD 1.3.1
3306/tcp  open  mysql       syn-ack ttl 64 MySQL 5.0.51a-3ubuntu5
3632/tcp  open  distccd     syn-ack ttl 64 distccd v1 ((GNU) 4.2.4 (Ubuntu 4.2.4-1ubuntu4))
5432/tcp  open  postgresql  syn-ack ttl 64 PostgreSQL DB 8.3.0 - 8.3.7
5900/tcp  open  vnc         syn-ack ttl 64 VNC (protocol 3.3)
6000/tcp  open  X11         syn-ack ttl 64 (access denied)
6667/tcp  open  irc         syn-ack ttl 64 UnrealIRCd
6697/tcp  open  irc         syn-ack ttl 64 UnrealIRCd
8009/tcp  open  ajp13       syn-ack ttl 64 Apache Jserv (Protocol v1.3)
8180/tcp  open  http        syn-ack ttl 64 Apache Tomcat/Coyote JSP engine 1.1
8787/tcp  open  drb         syn-ack ttl 64 Ruby DRb RMI (Ruby 1.8; path /usr/lib/ruby/1.8/drb)
33373/tcp open  nlockmgr    syn-ack ttl 64 1-4 (RPC #100021)
41382/tcp open  status      syn-ack ttl 64 1 (RPC #100024)
55263/tcp open  java-rmi    syn-ack ttl 64 GNU Classpath grmiregistry
59391/tcp open  mountd      syn-ack ttl 64 1-3 (RPC #100005)
MAC Address: 08:00:27:E4:29:4E (PCS Systemtechnik/Oracle VirtualBox virtual NIC)
Service Info: Hosts:  metasploitable.localdomain, irc.Metasploitable.LAN; OSs: Unix, Linux; CPE: cpe:/o:linux:linux_kernel

Service detection performed. Please report any incorrect results at https://nmap.org/submit/ .
Nmap done: 1 IP address (1 host up) scanned in 178.01 seconds
```

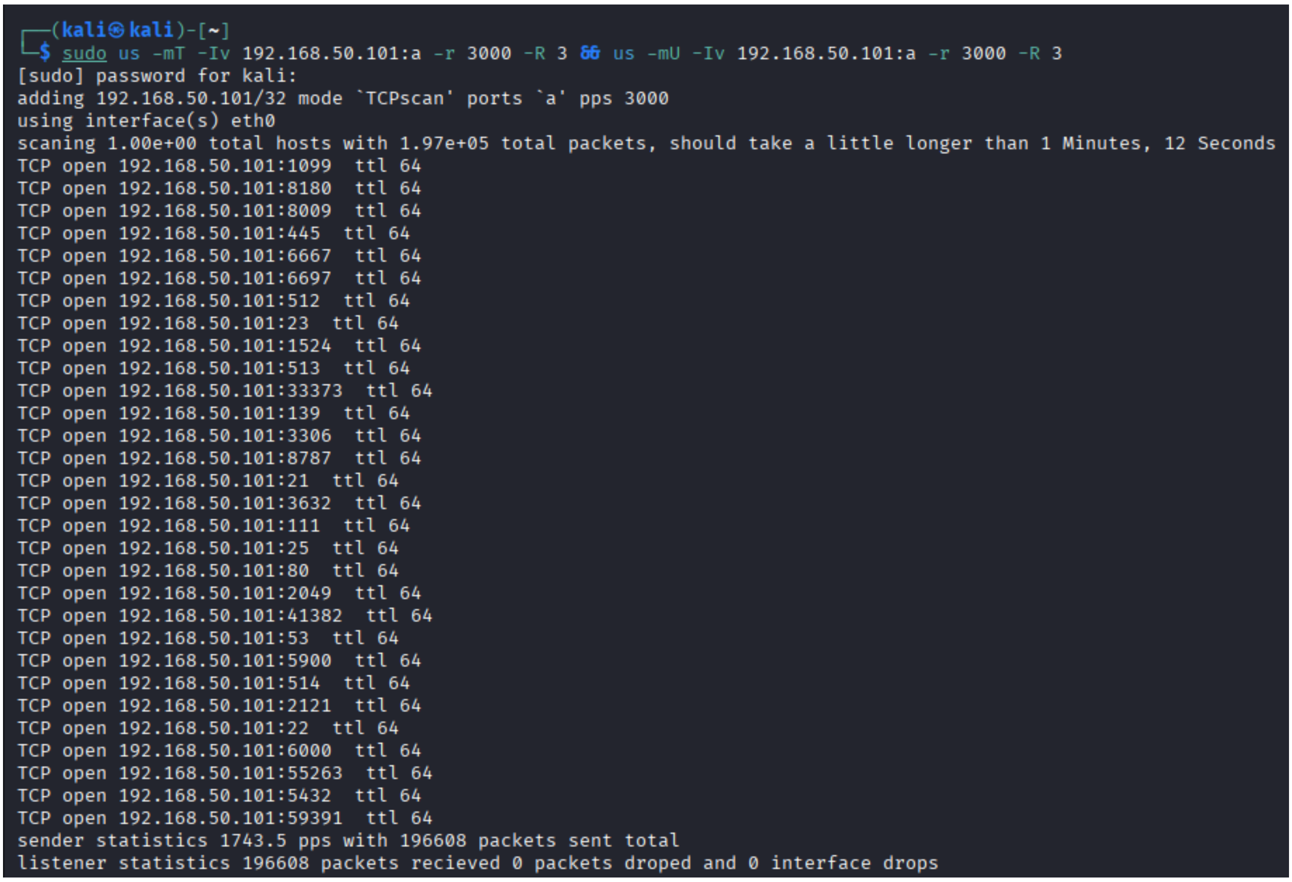
Unicornscan

Unicorn scan è uno strumento di **network reconnaissance e scanning ad alte prestazioni**.

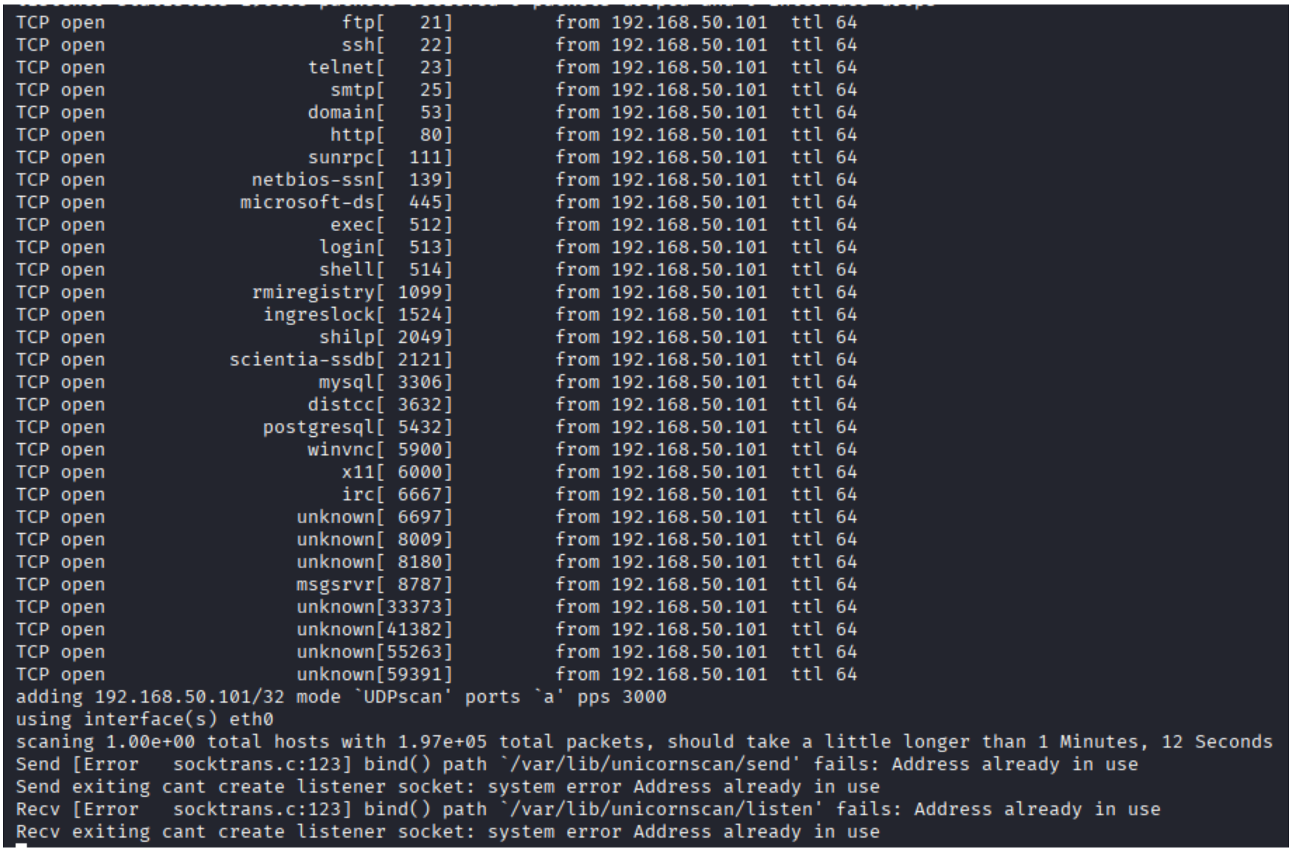
Ha scansionato tutte le porte TCP inviando 3000 pacchetti al secondo

sudo us -mT -Iv 192.168.50.101:a -r 3000 -R 3 && us -mU -Iv 192.168.50.101:a -r 3000 -R 3

us = Comado unicornscan
-mT = modalità **TCP scan**.
A = All, per scansionare tutte le porte
-mU = modalità **UDP scan**.
-r 3000 = rate ~ **3000 pacchetti al secondo**
-R 3 = retries o similar (3 ripetizioni/ tentativi).



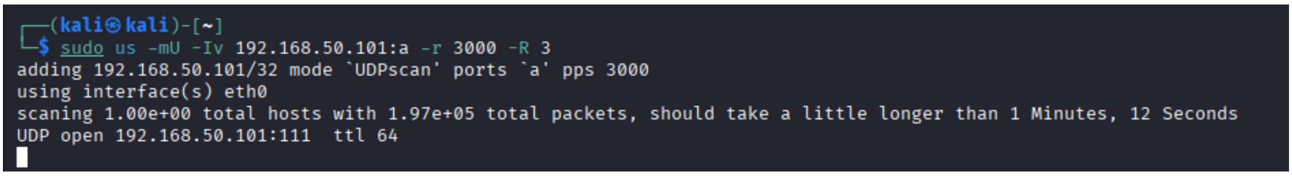
```
┌──(kali㉿kali)-[~]
└─$ sudo us -mT -Iv 192.168.50.101:a -r 3000 -R 3 && us -mU -Iv 192.168.50.101:a -r 3000 -R 3
[sudo] password for kali:
adding 192.168.50.101/32 mode `TCPscan' ports `a' pps 3000
using interface(s) eth0
scaning 1.00e+00 total hosts with 1.97e+05 total packets, should take a little longer than 1 Minutes, 12 Seconds
TCP open 192.168.50.101:1099  ttl 64
TCP open 192.168.50.101:8180  ttl 64
TCP open 192.168.50.101:8009  ttl 64
TCP open 192.168.50.101:445  ttl 64
TCP open 192.168.50.101:6667  ttl 64
TCP open 192.168.50.101:6697  ttl 64
TCP open 192.168.50.101:512  ttl 64
TCP open 192.168.50.101:23  ttl 64
TCP open 192.168.50.101:1524  ttl 64
TCP open 192.168.50.101:513  ttl 64
TCP open 192.168.50.101:33373  ttl 64
TCP open 192.168.50.101:139  ttl 64
TCP open 192.168.50.101:3306  ttl 64
TCP open 192.168.50.101:8787  ttl 64
TCP open 192.168.50.101:21  ttl 64
TCP open 192.168.50.101:3632  ttl 64
TCP open 192.168.50.101:111  ttl 64
TCP open 192.168.50.101:25  ttl 64
TCP open 192.168.50.101:80  ttl 64
TCP open 192.168.50.101:2049  ttl 64
TCP open 192.168.50.101:41382  ttl 64
TCP open 192.168.50.101:53  ttl 64
TCP open 192.168.50.101:5900  ttl 64
TCP open 192.168.50.101:514  ttl 64
TCP open 192.168.50.101:2121  ttl 64
TCP open 192.168.50.101:22  ttl 64
TCP open 192.168.50.101:6000  ttl 64
TCP open 192.168.50.101:55263  ttl 64
TCP open 192.168.50.101:5432  ttl 64
TCP open 192.168.50.101:59391  ttl 64
sender statistics 1743.5 pps with 196608 packets sent total
listener statistics 196608 packets recieved 0 packets droped and 0 interface drops
```



```
TCP open                     ftp[   21]         from 192.168.50.101  ttl 64
TCP open                     ssh[   22]         from 192.168.50.101  ttl 64
TCP open                  telnet[   23]         from 192.168.50.101  ttl 64
TCP open                    smtp[   25]         from 192.168.50.101  ttl 64
TCP open                  domain[   53]         from 192.168.50.101  ttl 64
TCP open                    http[   80]         from 192.168.50.101  ttl 64
TCP open                  sunrpc[  111]         from 192.168.50.101  ttl 64
TCP open             netbios-ssn[  139]         from 192.168.50.101  ttl 64
TCP open            microsoft-ds[  445]         from 192.168.50.101  ttl 64
TCP open                    exec[  512]         from 192.168.50.101  ttl 64
TCP open                   login[  513]         from 192.168.50.101  ttl 64
TCP open                   shell[  514]         from 192.168.50.101  ttl 64
TCP open             rmiregistry[ 1099]         from 192.168.50.101  ttl 64
TCP open              ingreslock[ 1524]         from 192.168.50.101  ttl 64
TCP open                   shilp[ 2049]         from 192.168.50.101  ttl 64
TCP open            scientia-ssdb[ 2121]        from 192.168.50.101  ttl 64
TCP open                   mysql[ 3306]         from 192.168.50.101  ttl 64
TCP open                  distcc[ 3632]         from 192.168.50.101  ttl 64
TCP open              postgresql[ 5432]         from 192.168.50.101  ttl 64
TCP open                  winvnc[ 5900]         from 192.168.50.101  ttl 64
TCP open                     x11[ 6000]         from 192.168.50.101  ttl 64
TCP open                    irc[ 6667]         from 192.168.50.101  ttl 64
TCP open                 unknown[ 6697]         from 192.168.50.101  ttl 64
TCP open                 unknown[ 8009]         from 192.168.50.101  ttl 64
TCP open                 unknown[ 8180]         from 192.168.50.101  ttl 64
TCP open                 msgsrvr[ 8787]         from 192.168.50.101  ttl 64
TCP open                 unknown[33373]         from 192.168.50.101  ttl 64
TCP open                 unknown[41382]         from 192.168.50.101  ttl 64
TCP open                 unknown[55263]         from 192.168.50.101  ttl 64
TCP open                 unknown[59391]         from 192.168.50.101  ttl 64
adding 192.168.50.101/32 mode `UDPscan' ports `a' pps 3000
using interface(s) eth0
scaning 1.00e+00 total hosts with 1.97e+05 total packets, should take a little longer than 1 Minutes, 12 Seconds
Send [Error   socktrans.c:123] bind() path `/var/lib/unicornscan/send' fails: Address already in use
Send exiting cant create listener socket: system error Address already in use
Recv [Error   socktrans.c:123] bind() path `/var/lib/unicornscan/listen' fails: Address already in use
Recv exiting cant create listener socket: system error Address already in use
```

Lo scan UDP non ha funzionato, quindi ho provato a lanciarlo da solo senza concatenarlo con la scansione TCP

Dopo un’ora ancora non aveva finito la scansione



```
┌──(kali㉿kali)-[~]
└─$ sudo us -mU -Iv 192.168.50.101:a -r 3000 -R 3
adding 192.168.50.101/32 mode `UDPscan' ports `a' pps 3000
using interface(s) eth0
scaning 1.00e+00 total hosts with 1.97e+05 total packets, should take a little longer than 1 Minutes, 12 Seconds
UDP open 192.168.50.101:111  ttl 64
```

TCP Syn Scan con Nmap

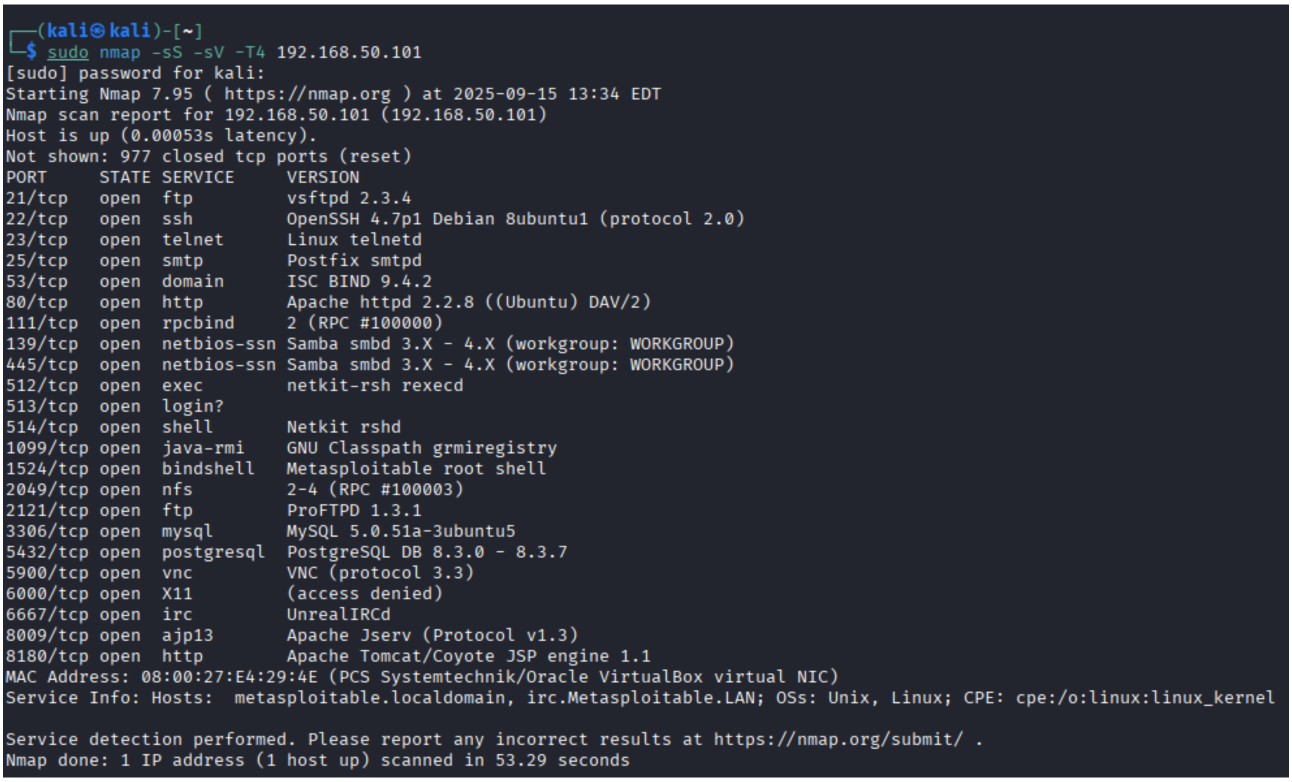
sudo nmap -sS -sV -T4 192.168.50.101

-T4 serve per accelerare la scansione, regola:

- La velocità
- Il parallelismo (più host/porte interrogate parallelamente)
- Il timeout della scansione

-T0 = paranoid (lentissimo, usato per evitare IDS)
-T1 = sneaky
-T2 = polite
-T3 = normal (default)
-T4 = aggressive (veloce, usato su LAN/ambienti affidabili)
-T5 = insane (massimo aggressività, rischioso)

In questo caso T4 accelera i risultati di -sS e -sV. Velocizzare ovviamente riduce l’affidabilità dei risultati.

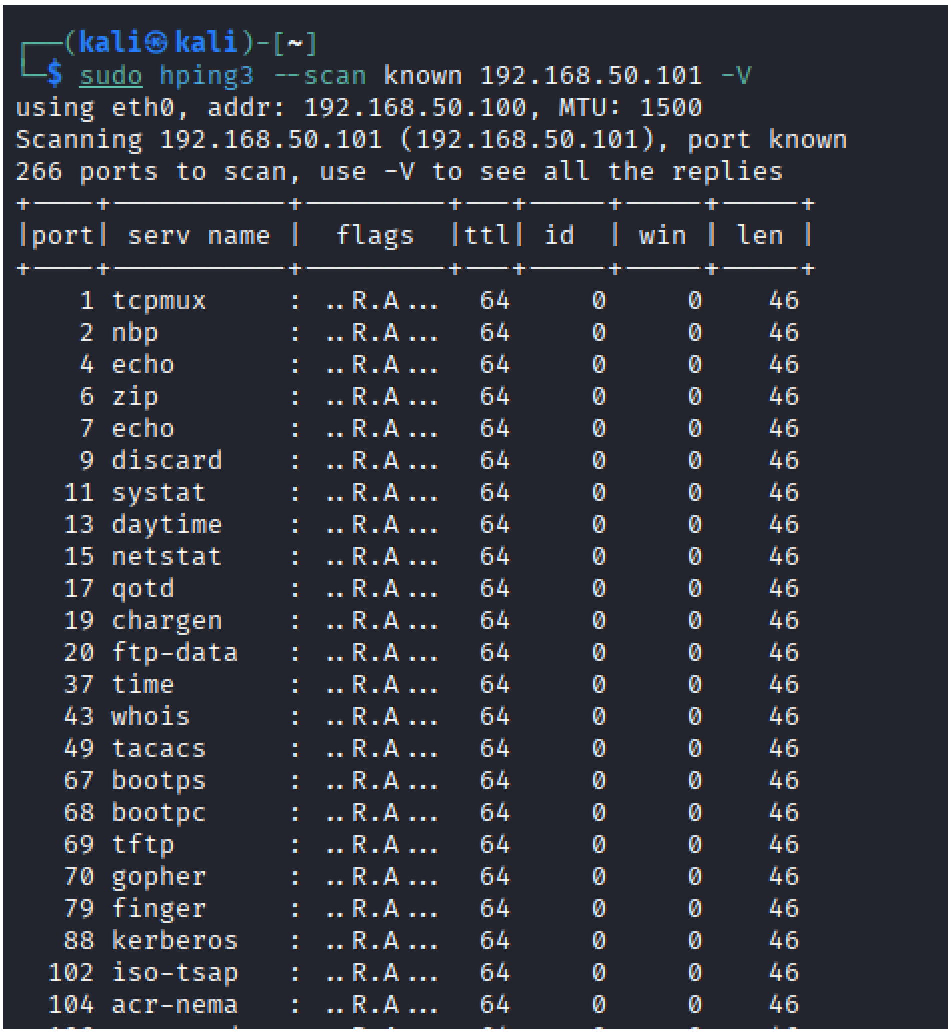


```
┌──(kali㉿kali)-[~]
└─$ sudo nmap -sS -sV -T4 192.168.50.101
[sudo] password for kali:
Starting Nmap 7.95 ( https://nmap.org ) at 2025-09-15 13:34 EDT
Nmap scan report for 192.168.50.101 (192.168.50.101)
Host is up (0.00053s latency).
Not shown: 977 closed tcp ports (reset)
PORT     STATE SERVICE     VERSION
21/tcp   open  ftp         vsftpd 2.3.4
22/tcp   open  ssh         OpenSSH 4.7p1 Debian 8ubuntu1 (protocol 2.0)
23/tcp   open  telnet      Linux telnetd
25/tcp   open  smtp        Postfix smtpd
53/tcp   open  domain      ISC BIND 9.4.2
80/tcp   open  http        Apache httpd 2.2.8 ((Ubuntu) DAV/2)
111/tcp  open  rpcbind     2 (RPC #100000)
139/tcp  open  netbios-ssn Samba smbd 3.X - 4.X (workgroup: WORKGROUP)
445/tcp  open  netbios-ssn Samba smbd 3.X - 4.X (workgroup: WORKGROUP)
512/tcp  open  exec        netkit-rsh rexecd
513/tcp  open  login?
514/tcp  open  shell       Netkit rshd
1099/tcp open  java-rmi    GNU Classpath grmiregistry
1524/tcp open  bindshell   Metasploitable root shell
2049/tcp open  nfs         2-4 (RPC #100003)
2121/tcp open  ftp         ProFTPD 1.3.1
3306/tcp open  mysql       MySQL 5.0.51a-3ubuntu5
5432/tcp open  postgresql  PostgreSQL DB 8.3.0 - 8.3.7
5900/tcp open  vnc         VNC (protocol 3.3)
6000/tcp open  X11         (access denied)
6667/tcp open  irc         UnrealIRCd
8009/tcp open  ajp13       Apache Jserv (Protocol v1.3)
8180/tcp open  http        Apache Tomcat/Coyote JSP engine 1.1
MAC Address: 08:00:27:E4:29:4E (PCS Systemtechnik/Oracle VirtualBox virtual NIC)
Service Info: Hosts:  metasploitable.localdomain, irc.Metasploitable.LAN; OSs: Unix, Linux; CPE: cpe:/o:linux:linux_kernel

Service detection performed. Please report any incorrect results at https://nmap.org/submit/ .
Nmap done: 1 IP address (1 host up) scanned in 53.29 seconds
```

Scansione con HPING3

sudo hping3 --scan known 192.168.50.101

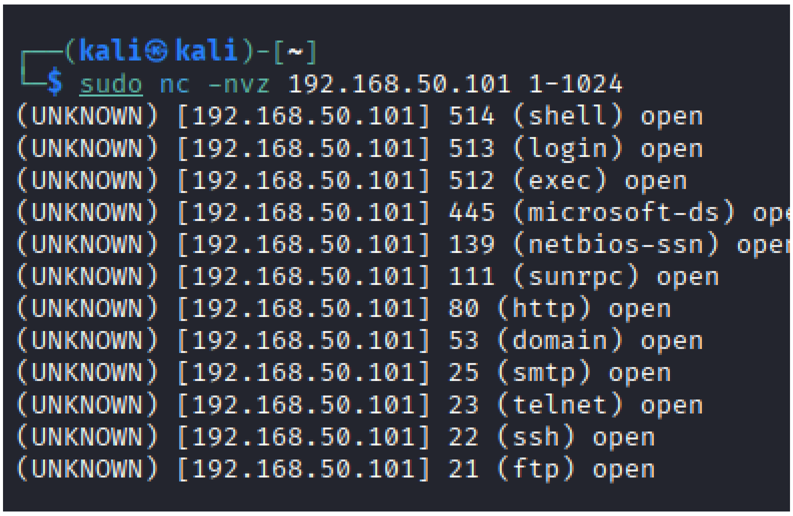
HPING, rispetto a ping è in grado di inviare non solo richieste echo ICMP ma anche TCP, UDP, ICMP e RAW-IP



```
┌──(kali㉿kali)-[~]
└─$ sudo hping3 --scan known 192.168.50.101 -V
using eth0, addr: 192.168.50.100, MTU: 1500
Scanning 192.168.50.101 (192.168.50.101), port known
266 ports to scan, use -V to see all the replies
+----+-----------+---------+---+-----+-----+-----+
|port| serv name |  flags  |ttl| id  | win | len |
+----+-----------+---------+---+-----+-----+-----+
    1 tcpmux     : ..R.A...  64     0     0    46
    2 nbp        : ..R.A...  64     0     0    46
    4 echo       : ..R.A...  64     0     0    46
    6 zip        : ..R.A...  64     0     0    46
    7 echo       : ..R.A...  64     0     0    46
    9 discard    : ..R.A...  64     0     0    46
   11 systat     : ..R.A...  64     0     0    46
   13 daytime    : ..R.A...  64     0     0    46
   15 netstat    : ..R.A...  64     0     0    46
   17 qotd       : ..R.A...  64     0     0    46
   19 chargen    : ..R.A...  64     0     0    46
   20 ftp-data   : ..R.A...  64     0     0    46
   37 time       : ..R.A...  64     0     0    46
   43 whois      : ..R.A...  64     0     0    46
   49 tacacs     : ..R.A...  64     0     0    46
   67 bootps     : ..R.A...  64     0     0    46
   68 bootpc     : ..R.A...  64     0     0    46
   69 tftp       : ..R.A...  64     0     0    46
   70 gopher     : ..R.A...  64     0     0    46
   79 finger     : ..R.A...  64     0     0    46
   88 kerberos   : ..R.A...  64     0     0    46
  102 iso-tsap   : ..R.A...  64     0     0    46
  104 acr-nema   : ..R.A...  64     0     0    46
```

Scansione porte con Netcat

sudo nc -nvz 192.168.50.101 1-1024

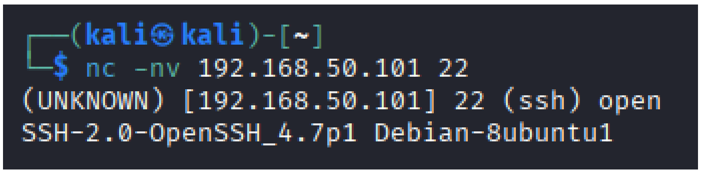


```
┌──(kali㉿kali)-[~]
└─$ sudo nc -nvz 192.168.50.101 1-1024
(UNKNOWN) [192.168.50.101] 514 (shell) open
(UNKNOWN) [192.168.50.101] 513 (login) open
(UNKNOWN) [192.168.50.101] 512 (exec) open
(UNKNOWN) [192.168.50.101] 445 (microsoft-ds) ope
(UNKNOWN) [192.168.50.101] 139 (netbios-ssn) oper
(UNKNOWN) [192.168.50.101] 111 (sunrpc) open
(UNKNOWN) [192.168.50.101] 80 (http) open
(UNKNOWN) [192.168.50.101] 53 (domain) open
(UNKNOWN) [192.168.50.101] 25 (smtp) open
(UNKNOWN) [192.168.50.101] 23 (telnet) open
(UNKNOWN) [192.168.50.101] 22 (ssh) open
(UNKNOWN) [192.168.50.101] 21 (ftp) open
```

Banner Grabbing con Netcat

nc -nv 192.168.50.101 22

È stata stabilita una connessione con la porta 22 ottenendo il banner SSH.

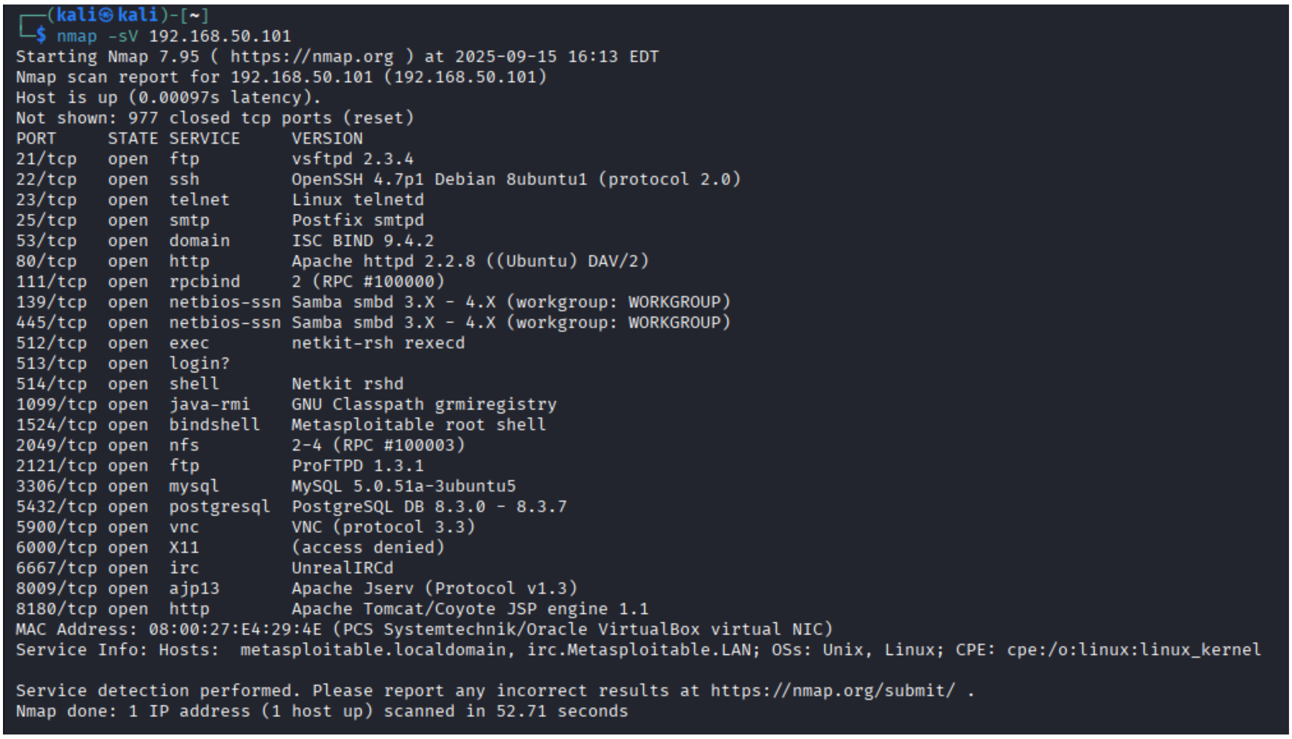


```
┌──(kali㉿kali)-[~]
└─$ nc -nv 192.168.50.101 22
(UNKNOWN) [192.168.50.101] 22 (ssh) open
SSH-2.0-OpenSSH_4.7p1 Debian-8ubuntu1
```

Scansione porte con Nmap per info su servizi e versioni

nmap -sV 192.168.50.101

La scansione rileva le porte aperte, i relativi servizi e le informazioni sulle versioni.

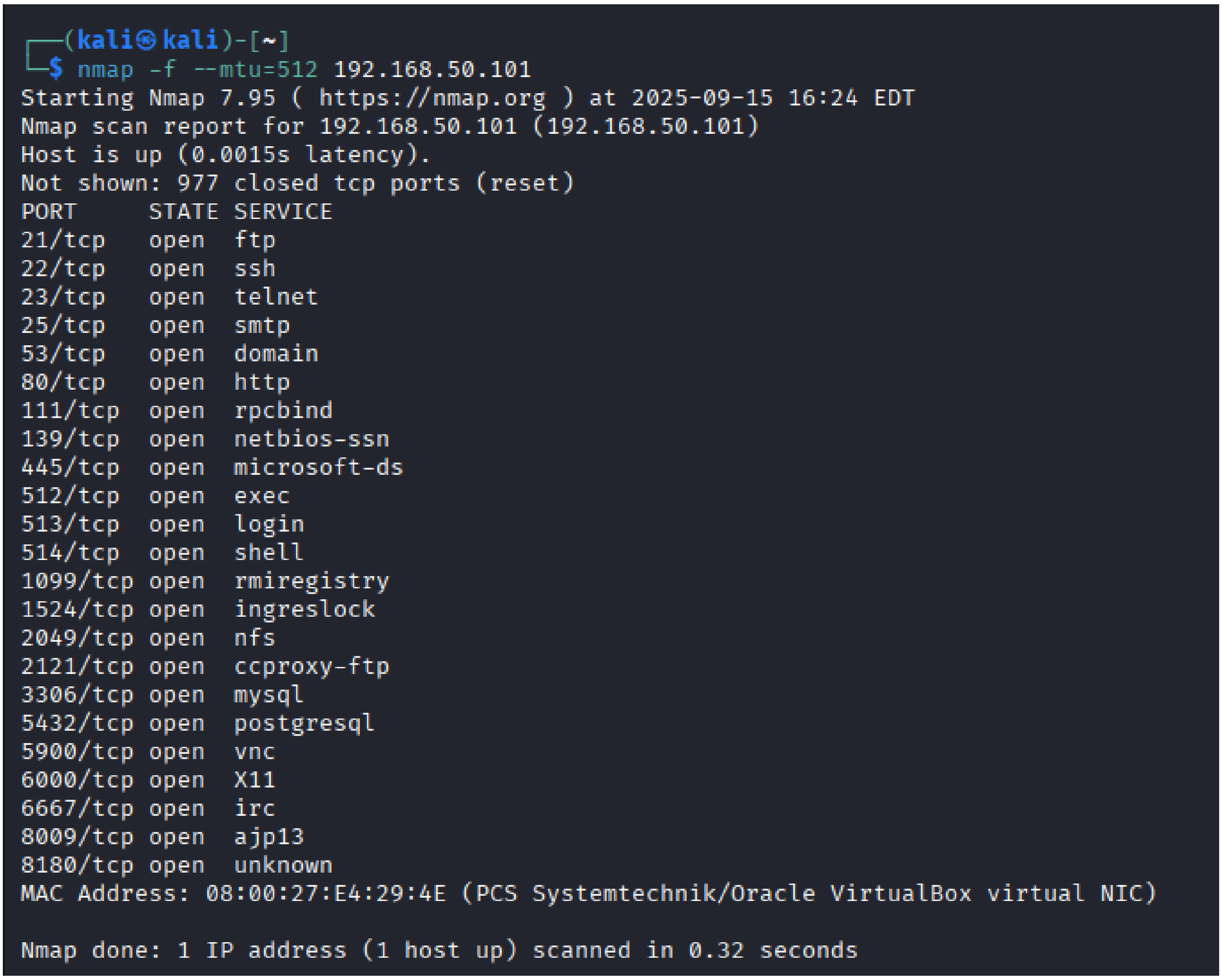


```
┌──(kali㉿kali)-[~]
└─$ nmap -sV 192.168.50.101
Starting Nmap 7.95 ( https://nmap.org ) at 2025-09-15 16:13 EDT
Nmap scan report for 192.168.50.101 (192.168.50.101)
Host is up (0.00097s latency).
Not shown: 977 closed tcp ports (reset)
PORT     STATE SERVICE     VERSION
21/tcp   open  ftp         vsftpd 2.3.4
22/tcp   open  ssh         OpenSSH 4.7p1 Debian 8ubuntu1 (protocol 2.0)
23/tcp   open  telnet      Linux telnetd
25/tcp   open  smtp        Postfix smtpd
53/tcp   open  domain      ISC BIND 9.4.2
80/tcp   open  http        Apache httpd 2.2.8 ((Ubuntu) DAV/2)
111/tcp  open  rpcbind     2 (RPC #100000)
139/tcp  open  netbios-ssn Samba smbd 3.X - 4.X (workgroup: WORKGROUP)
445/tcp  open  netbios-ssn Samba smbd 3.X - 4.X (workgroup: WORKGROUP)
512/tcp  open  exec        netkit-rsh rexecd
513/tcp  open  login?
514/tcp  open  shell       Netkit rshd
1099/tcp open  java-rmi    GNU Classpath grmiregistry
1524/tcp open  bindshell   Metasploitable root shell
2049/tcp open  nfs         2-4 (RPC #100003)
2121/tcp open  ftp         ProFTPD 1.3.1
3306/tcp open  mysql       MySQL 5.0.51a-3ubuntu5
5432/tcp open  postgresql  PostgreSQL DB 8.3.0 - 8.3.7
5900/tcp open  vnc         VNC (protocol 3.3)
6000/tcp open  X11         (access denied)
6667/tcp open  irc         UnrealIRCd
8009/tcp open  ajp13       Apache Jserv (Protocol v1.3)
8180/tcp open  http        Apache Tomcat/Coyote JSP engine 1.1
MAC Address: 08:00:27:E4:29:4E (PCS Systemtechnik/Oracle VirtualBox virtual NIC)
Service Info: Hosts:  metasploitable.localdomain, irc.Metasploitable.LAN; OSs: Unix, Linux; CPE: cpe:/o:linux:linux_kernel

Service detection performed. Please report any incorrect results at https://nmap.org/submit/ .
Nmap done: 1 IP address (1 host up) scanned in 52.71 seconds
```

Scansione con by-pass del Firewall con Nmap

nmap -f --mtu=512 192.168.50.101

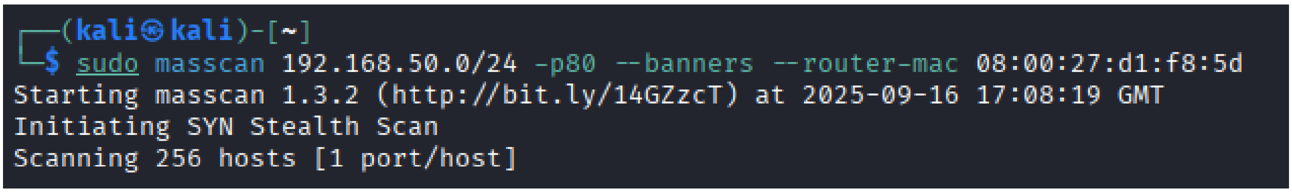
-f frammenta i pacchetti inviati da nmap
--mtu 512 imposta la dimensione (512 byte) del frammento



```
┌──(kali㉿kali)-[~]
└─$ nmap -f --mtu=512 192.168.50.101
Starting Nmap 7.95 ( https://nmap.org ) at 2025-09-15 16:24 EDT
Nmap scan report for 192.168.50.101 (192.168.50.101)
Host is up (0.0015s latency).
Not shown: 977 closed tcp ports (reset)
PORT     STATE SERVICE
21/tcp   open  ftp
22/tcp   open  ssh
23/tcp   open  telnet
25/tcp   open  smtp
53/tcp   open  domain
80/tcp   open  http
111/tcp  open  rpcbind
139/tcp  open  netbios-ssn
445/tcp  open  microsoft-ds
512/tcp  open  exec
513/tcp  open  login
514/tcp  open  shell
1099/tcp open  rmiregistry
1524/tcp open  ingreslock
2049/tcp open  nfs
2121/tcp open  ccproxy-ftp
3306/tcp open  mysql
5432/tcp open  postgresql
5900/tcp open  vnc
6000/tcp open  X11
6667/tcp open  irc
8009/tcp open  ajp13
8180/tcp open  unknown
MAC Address: 08:00:27:E4:29:4E (PCS Systemtechnik/Oracle VirtualBox virtual NIC)

Nmap done: 1 IP address (1 host up) scanned in 0.32 seconds
```

Scansione con Masscan

Masscan è uno scanner molto veloce, per scansioni massive, scansionerà solo la porta 80 di tutti gli indirizzi della subnet 192.168.50.0/24.



```
┌──(kali㉿kali)-[~]
└─$ sudo masscan 192.168.50.0/24 -p80 --banners --router-mac 08:00:27:d1:f8:5d
Starting masscan 1.3.2 (http://bit.ly/14GZzcT) at 2025-09-16 17:08:19 GMT
Initiating SYN Stealth Scan
Scanning 256 hosts [1 port/host]
```

Riepilogo informazioni

Host rete		Ruolo macchina	OS
192.168.50.101	METASPLOITABLE	Macchina target	Linux 2.6.X
192.168.50.100	KALI	Macchina attaccante	

Port		State (toggle closed [0] | filtered [0])	Service	Reason	Product	Version	Extra info
21	tcp	open	ftp	syn-ack	vsftpd	2.3.4	
22	tcp	open	ssh	syn-ack	OpenSSH	4.7p1 Debian 8ubuntu1	protocol 2.0
23	tcp	open	telnet	syn-ack	Linux telnetd		
25	tcp	open	smtp	syn-ack	Postfix smtpd		
53	tcp	open	domain	syn-ack	ISC BIND	9.4.2	
80	tcp	open	http	syn-ack	Apache httpd	2.2.8	(Ubuntu) DAV/2
111	tcp	open	rpcbind	syn-ack		2	RPC #100000
139	tcp	open	netbios-ssn	syn-ack	Samba smbd	3.X - 4.X	workgroup: WORKGROUP
445	tcp	open	netbios-ssn	syn-ack	Samba smbd	3.X - 4.X	workgroup: WORKGROUP
512	tcp	open	exec	syn-ack	netkit-rsh rexecd		
513	tcp	open	login	syn-ack			
514	tcp	open	shell	syn-ack	Netkit rshd		
1099	tcp	open	java-rmi	syn-ack	GNU Classpath grmiregistry		
1524	tcp	open	bindshell	syn-ack	Metasploitable root shell		
2049	tcp	open	nfs	syn-ack		2-4	RPC #100003

2121	tcp	open	ftp	syn-ack	ProFTPD	1.3.1	
3306	tcp	open	mysql	syn-ack	MySQL	5.0.51a-3ubuntu5	
3632	tcp	open	distccd	syn-ack	distccd	v1	(GNU) 4.2.4 (Ubuntu 4.2.4-1ubuntu4)
5432	tcp	open	postgresql	syn-ack	PostgreSQL DB	8.3.0 - 8.3.7	
5900	tcp	open	vnc	syn-ack	VNC		protocol 3.3
6000	tcp	open	X11	syn-ack			access denied
6667	tcp	open	irc	syn-ack	UnrealIRCd		
6697	tcp	open	irc	syn-ack	UnrealIRCd		
8009	tcp	open	ajp13	syn-ack	Apache Jserv		Protocol v1.3
8180	tcp	open	http	syn-ack	Apache Tomcat/Coyote JSP engine	1.1	
8787	tcp	open	drb	syn-ack	Ruby DRb RMI		Ruby 1.8; path /usr/lib/ruby/1.8/drb
####	tcp	open	nlockmgr	syn-ack		1-4	RPC #100021
####	tcp	open	status	syn-ack		1	RPC #100024
####	tcp	open	java-rmi	syn-ack	GNU Classpath grmiregistry		
####	tcp	open	mountd	syn-ack		1-3	RPC #100005

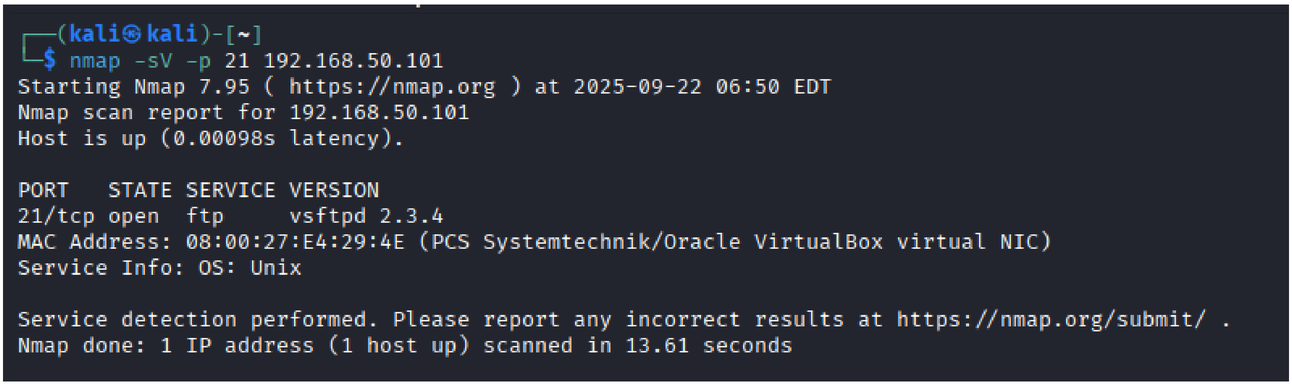
Metodi di evasione firewall con Nmap

NMAP con Timing

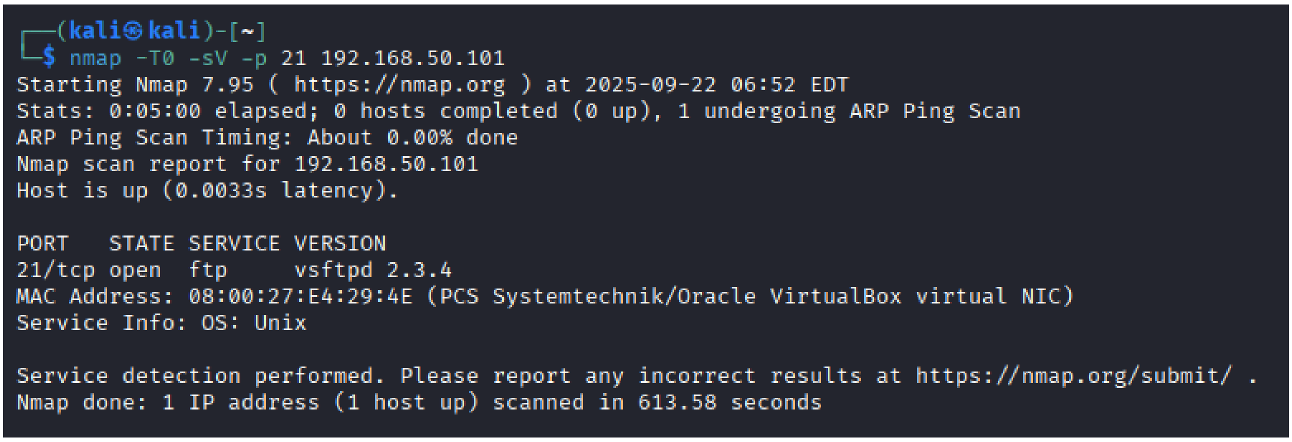
Il timing impostato a 0 allunga il tempo tra una richiesta e l'altra e il parallelismo per eludere IPS/IDS.

In questo caso ho eseguito nmap -T0 su una sola porta per evitare scansioni lunghissime.

Di seguito possiamo notare che la scansione senza il timing ha impiegato 13,61 secondi, mentre quella con il -T0 ha impiegato 613,58 secondi.



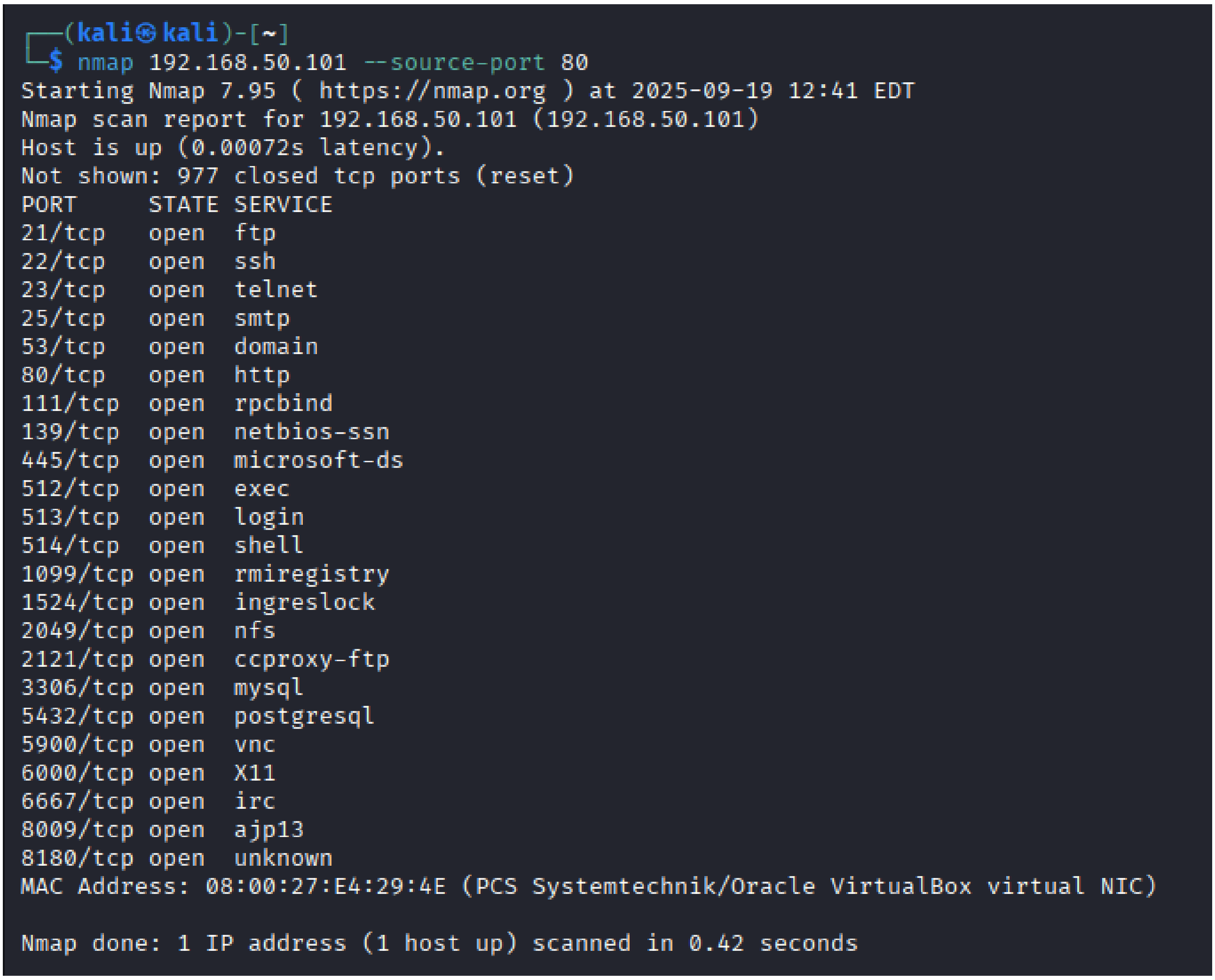
```
┌──(kali㉿kali)-[~]
└─$ nmap -sV -p 21 192.168.50.101
Starting Nmap 7.95 ( https://nmap.org ) at 2025-09-22 06:50 EDT
Nmap scan report for 192.168.50.101
Host is up (0.00098s latency).

PORT   STATE SERVICE VERSION
21/tcp open  ftp     vsftpd 2.3.4
MAC Address: 08:00:27:E4:29:4E (PCS Systemtechnik/Oracle VirtualBox virtual NIC)
Service Info: OS: Unix

Service detection performed. Please report any incorrect results at https://nmap.org/submit/ .
Nmap done: 1 IP address (1 host up) scanned in 13.61 seconds
```



```
┌──(kali㉿kali)-[~]
└─$ nmap -T0 -sV -p 21 192.168.50.101
Starting Nmap 7.95 ( https://nmap.org ) at 2025-09-22 06:52 EDT
Stats: 0:05:00 elapsed; 0 hosts completed (0 up), 1 undergoing ARP Ping Scan
ARP Ping Scan Timing: About 0.00% done
Nmap scan report for 192.168.50.101
Host is up (0.0033s latency).

PORT   STATE SERVICE VERSION
21/tcp open  ftp     vsftpd 2.3.4
MAC Address: 08:00:27:E4:29:4E (PCS Systemtechnik/Oracle VirtualBox virtual NIC)
Service Info: OS: Unix

Service detection performed. Please report any incorrect results at https://nmap.org/submit/ .
Nmap done: 1 IP address (1 host up) scanned in 613.58 seconds
```

NMAP source port manipulation

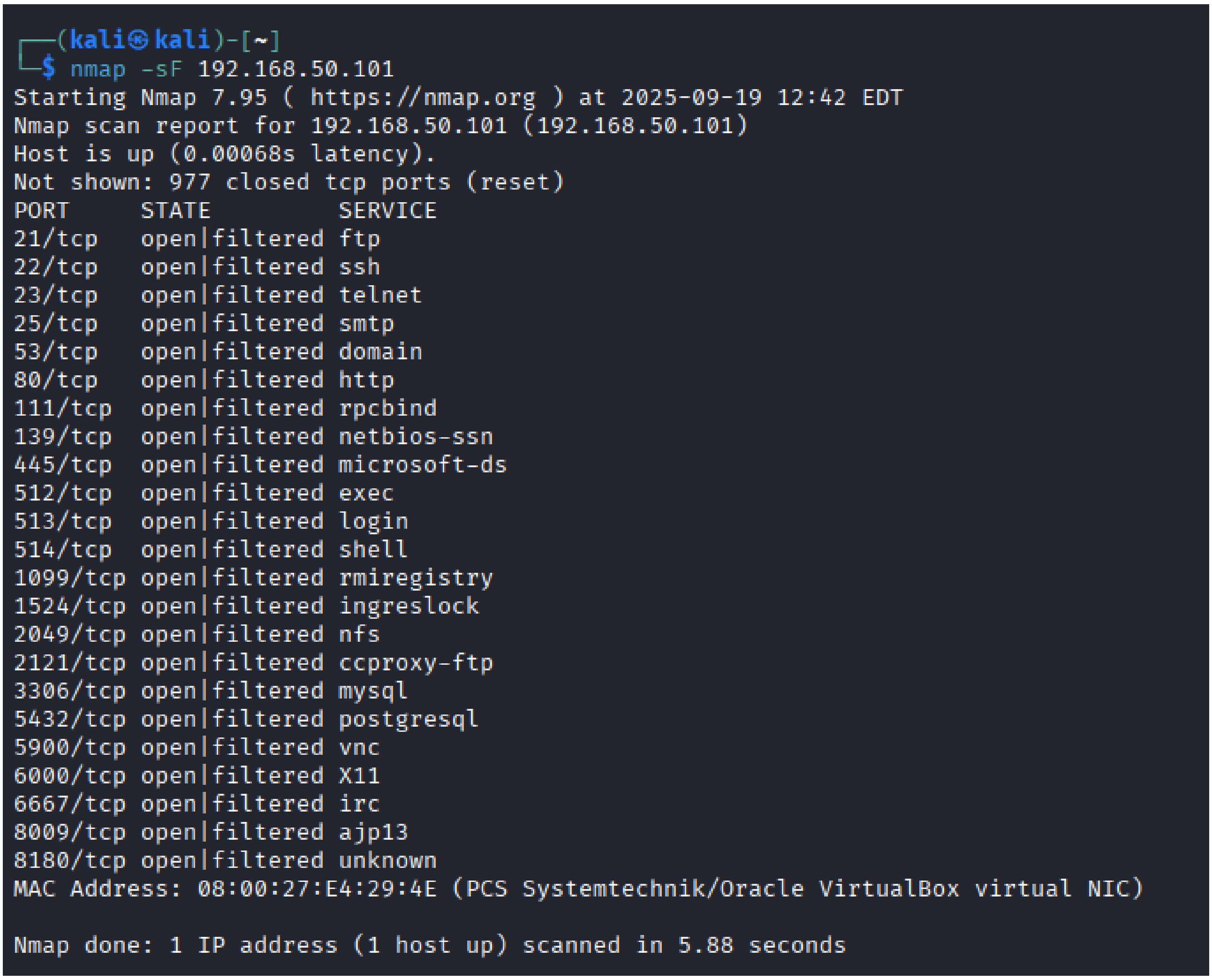
Per eludere IPS/IDS è possibile inviare pacchetti da porte note, come la porta 80.



```
┌──(kali㉿kali)-[~]
└─$ nmap 192.168.50.101 --source-port 80
Starting Nmap 7.95 ( https://nmap.org ) at 2025-09-19 12:41 EDT
Nmap scan report for 192.168.50.101 (192.168.50.101)
Host is up (0.00072s latency).
Not shown: 977 closed tcp ports (reset)
PORT     STATE SERVICE
21/tcp   open  ftp
22/tcp   open  ssh
23/tcp   open  telnet
25/tcp   open  smtp
53/tcp   open  domain
80/tcp   open  http
111/tcp  open  rpcbind
139/tcp  open  netbios-ssn
445/tcp  open  microsoft-ds
512/tcp  open  exec
513/tcp  open  login
514/tcp  open  shell
1099/tcp open  rmiregistry
1524/tcp open  ingreslock
2049/tcp open  nfs
2121/tcp open  ccproxy-ftp
3306/tcp open  mysql
5432/tcp open  postgresql
5900/tcp open  vnc
6000/tcp open  X11
6667/tcp open  irc
8009/tcp open  ajp13
8180/tcp open  unknown
MAC Address: 08:00:27:E4:29:4E (PCS Systemtechnik/Oracle VirtualBox virtual NIC)

Nmap done: 1 IP address (1 host up) scanned in 0.42 seconds
```

FIN scan

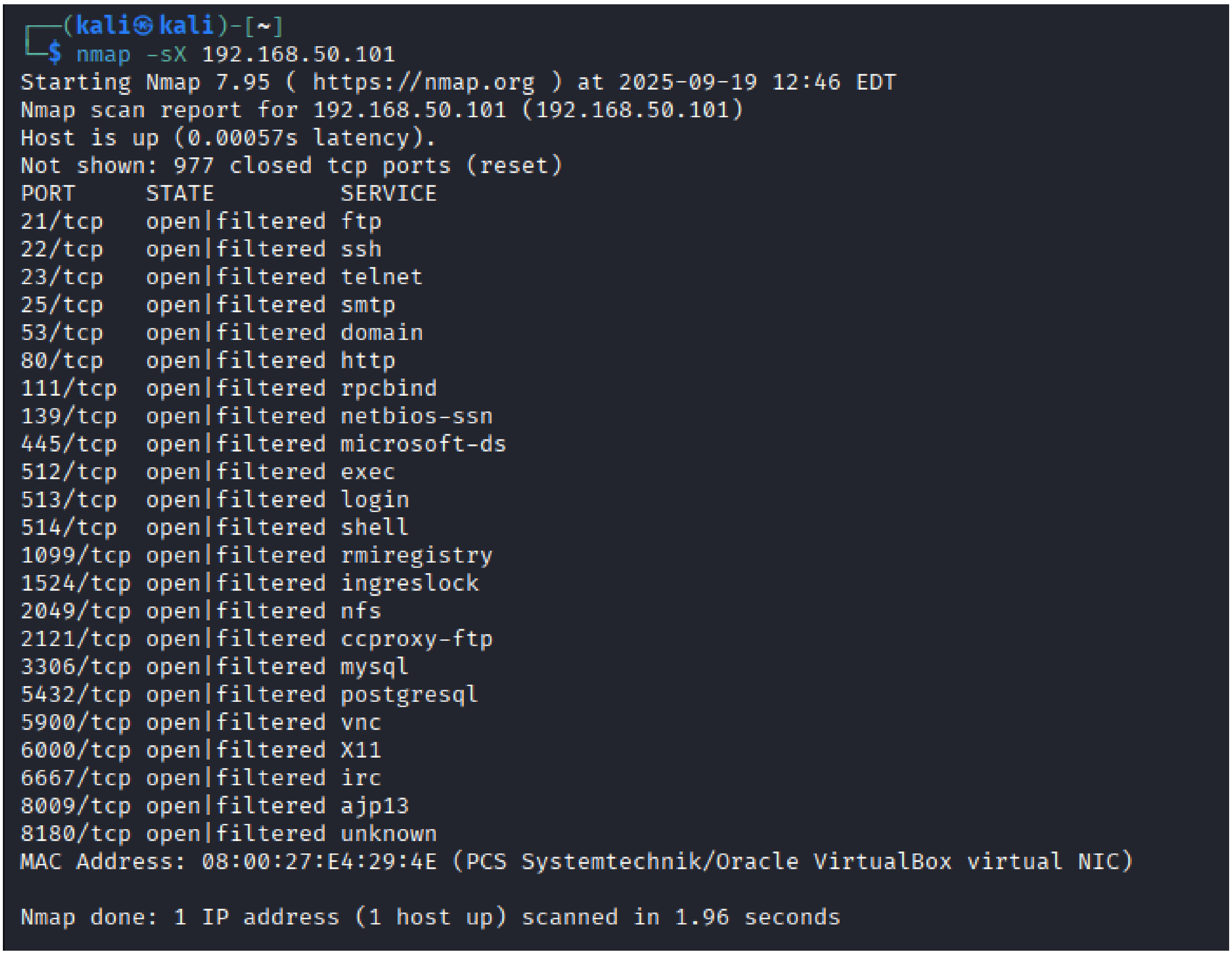
Lo scan invia un pacchetto con solo il flag FIN (per chiudere la sessione). Non seguendo il normale three-way handshake potrebbe passare più inosservato rispetto a uno scan SYN classico.



```
┌──(kali㉿kali)-[~]
└─$ nmap -sF 192.168.50.101
Starting Nmap 7.95 ( https://nmap.org ) at 2025-09-19 12:42 EDT
Nmap scan report for 192.168.50.101 (192.168.50.101)
Host is up (0.00068s latency).
Not shown: 977 closed tcp ports (reset)
PORT     STATE         SERVICE
21/tcp   open|filtered ftp
22/tcp   open|filtered ssh
23/tcp   open|filtered telnet
25/tcp   open|filtered smtp
53/tcp   open|filtered domain
80/tcp   open|filtered http
111/tcp  open|filtered rpcbind
139/tcp  open|filtered netbios-ssn
445/tcp  open|filtered microsoft-ds
512/tcp  open|filtered exec
513/tcp  open|filtered login
514/tcp  open|filtered shell
1099/tcp open|filtered rmiregistry
1524/tcp open|filtered ingreslock
2049/tcp open|filtered nfs
2121/tcp open|filtered ccproxy-ftp
3306/tcp open|filtered mysql
5432/tcp open|filtered postgresql
5900/tcp open|filtered vnc
6000/tcp open|filtered X11
6667/tcp open|filtered irc
8009/tcp open|filtered ajp13
8180/tcp open|filtered unknown
MAC Address: 08:00:27:E4:29:4E (PCS Systemtechnik/Oracle VirtualBox virtual NIC)

Nmap done: 1 IP address (1 host up) scanned in 5.88 seconds
```

Xmas

È un tipo di scan TCP che invia pacchetti con i flag FIN, PSH e URG. Anche questo scan, non seguendo il normale three-way handshake, potrebbe passare più inosservato rispetto a uno scan SYN classico.



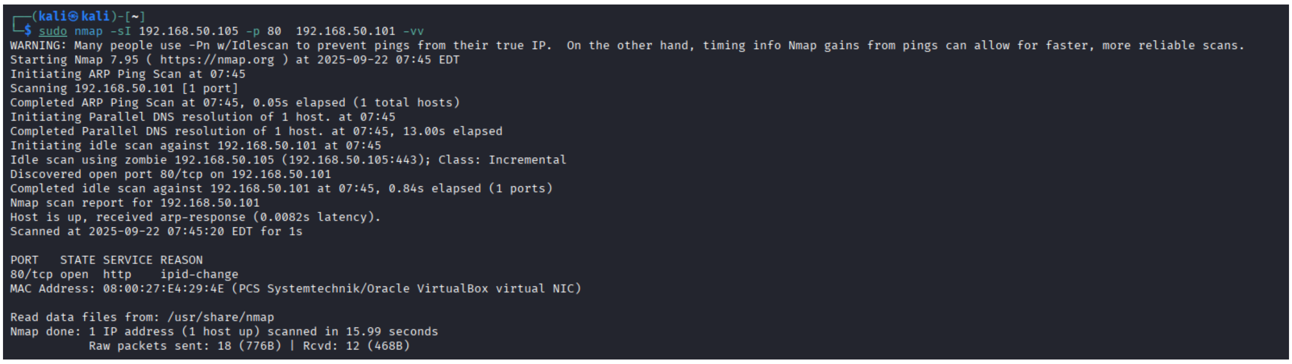
```
┌──(kali㉿kali)-[~]
└─$ nmap -sX 192.168.50.101
Starting Nmap 7.95 ( https://nmap.org ) at 2025-09-19 12:46 EDT
Nmap scan report for 192.168.50.101 (192.168.50.101)
Host is up (0.00057s latency).
Not shown: 977 closed tcp ports (reset)
PORT     STATE         SERVICE
21/tcp   open|filtered ftp
22/tcp   open|filtered ssh
23/tcp   open|filtered telnet
25/tcp   open|filtered smtp
53/tcp   open|filtered domain
80/tcp   open|filtered http
111/tcp  open|filtered rpcbind
139/tcp  open|filtered netbios-ssn
445/tcp  open|filtered microsoft-ds
512/tcp  open|filtered exec
513/tcp  open|filtered login
514/tcp  open|filtered shell
1099/tcp open|filtered rmiregistry
1524/tcp open|filtered ingreslock
2049/tcp open|filtered nfs
2121/tcp open|filtered ccproxy-ftp
3306/tcp open|filtered mysql
5432/tcp open|filtered postgresql
5900/tcp open|filtered vnc
6000/tcp open|filtered X11
6667/tcp open|filtered irc
8009/tcp open|filtered ajp13
8180/tcp open|filtered unknown
MAC Address: 08:00:27:E4:29:4E (PCS Systemtechnik/Oracle VirtualBox virtual NIC)

Nmap done: 1 IP address (1 host up) scanned in 1.96 seconds
```

TCP Idle scanning

Tecnica che sfrutta un terzo host “zombie” per nascondere lo scanning.

Lo scanner non manda i pacchetti direttamente al target ma forgia (esegue lo sproofing) pacchetti con l’IP sorgente dello zombie. Lo scanner osserva lo zombie per dedurre se il target ha risposto o meno.

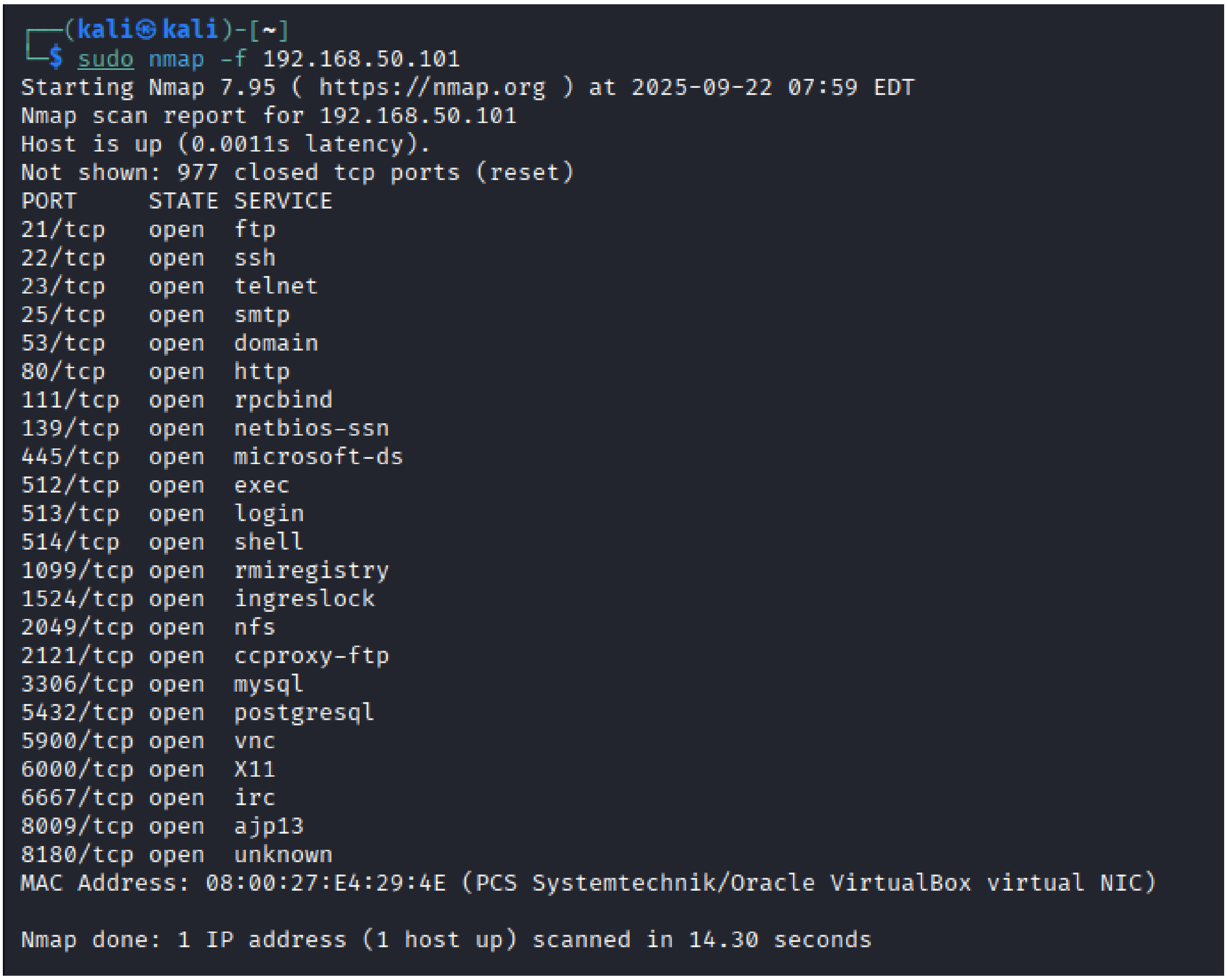
Kali (scanner): **192.168.50.100**
Metasploitable (target): **192.168.50.101**
Windows (zombie): **192.168.50.105**



```
┌──(kali㉿kali)-[~]
└─$ sudo nmap -sI 192.168.50.105 -p 80  192.168.50.101 -vv
WARNING: Many people use -Pn w/Idlescan to prevent pings from their true IP.  On the other hand, timing info Nmap gains from pings can allow for faster, more reliable scans.
Starting Nmap 7.95 ( https://nmap.org ) at 2025-09-22 07:45 EDT
Initiating ARP Ping Scan at 07:45
Scanning 192.168.50.101 [1 port]
Completed ARP Ping Scan at 07:45, 0.05s elapsed (1 total hosts)
Initiating Parallel DNS resolution of 1 host. at 07:45
Completed Parallel DNS resolution of 1 host. at 07:45, 13.00s elapsed
Initiating idle scan against 192.168.50.101 at 07:45
Idle scan using zombie 192.168.50.105 (192.168.50.105:443); Class: Incremental
Discovered open port 80/tcp on 192.168.50.101
Completed idle scan against 192.168.50.101 at 07:45, 0.84s elapsed (1 ports)
Nmap scan report for 192.168.50.101
Host is up, received arp-response (0.0082s latency).
Scanned at 2025-09-22 07:45:20 EDT for 1s

PORT   STATE SERVICE REASON
80/tcp open  http    ipid-change
MAC Address: 08:00:27:E4:29:4E (PCS Systemtechnik/Oracle VirtualBox virtual NIC)

Read data files from: /usr/share/nmap
Nmap done: 1 IP address (1 host up) scanned in 15.99 seconds
           Raw packets sent: 18 (776B) | Rcvd: 12 (468B)
```

Fragmentation

La **frammentazione IP** consiste nel dividere un pacchetto TCP/IP in più pezzi più piccoli, prima di inviarlo alla destinazione. Questo può servire a evitare IDS/IPS, perché alcuni firewall o IDS non riassemblano correttamente i pacchetti frammentati.



```
┌──(kali㉿kali)-[~]
└─$ sudo nmap -f 192.168.50.101
Starting Nmap 7.95 ( https://nmap.org ) at 2025-09-22 07:59 EDT
Nmap scan report for 192.168.50.101
Host is up (0.0011s latency).
Not shown: 977 closed tcp ports (reset)
PORT     STATE SERVICE
21/tcp   open  ftp
22/tcp   open  ssh
23/tcp   open  telnet
25/tcp   open  smtp
53/tcp   open  domain
80/tcp   open  http
111/tcp  open  rpcbind
139/tcp  open  netbios-ssn
445/tcp  open  microsoft-ds
512/tcp  open  exec
513/tcp  open  login
514/tcp  open  shell
1099/tcp open  rmiregistry
1524/tcp open  ingreslock
2049/tcp open  nfs
2121/tcp open  ccproxy-ftp
3306/tcp open  mysql
5432/tcp open  postgresql
5900/tcp open  vnc
6000/tcp open  X11
6667/tcp open  irc
8009/tcp open  ajp13
8180/tcp open  unknown
MAC Address: 08:00:27:E4:29:4E (PCS Systemtechnik/Oracle VirtualBox virtual NIC)

Nmap done: 1 IP address (1 host up) scanned in 14.30 seconds
```