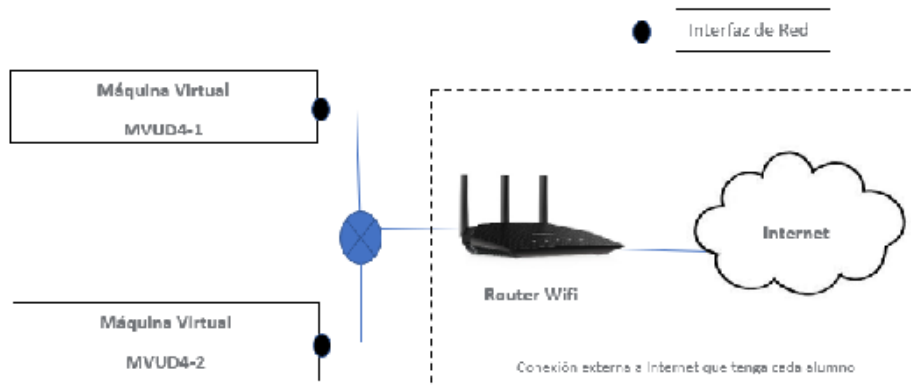


# UNIDAD 7 - ACTIVIDAD PRÁCTICA

## RED DE COMUNICACIONES BÁSICA

**EJERCICIO 1.** El alumno deberá crear el siguiente esquema de red.

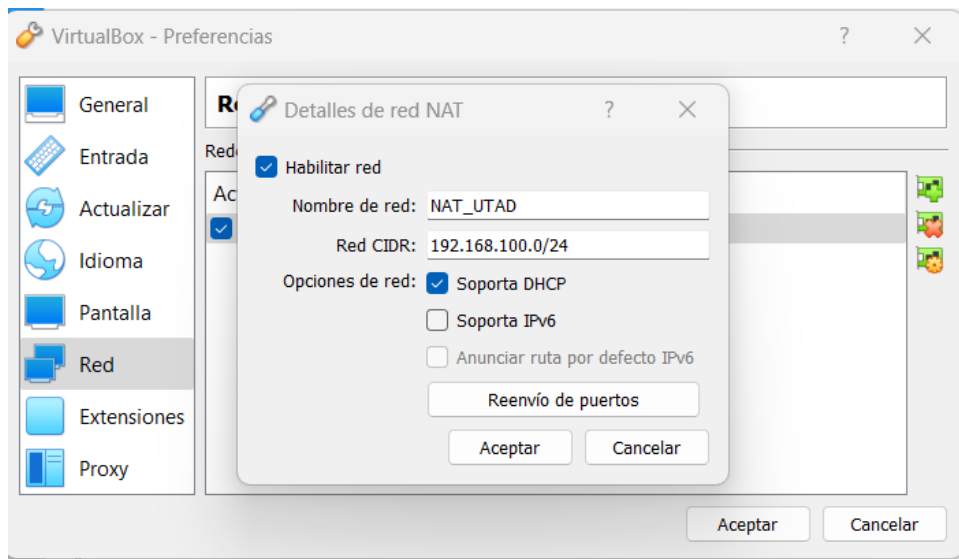


Finalmente, por economización de tiempo ya que tenía un par de máquinas virtuales creadas, he hecho la práctica con estas. (pedroVB y pacoVB), los nombres de las máquinas cambian respecto a la actividad, pero la arquitectura de red es la misma.

**EJERCICIO 2.** Crear una Red\_NAT en VirtualBoX con los siguientes datos:

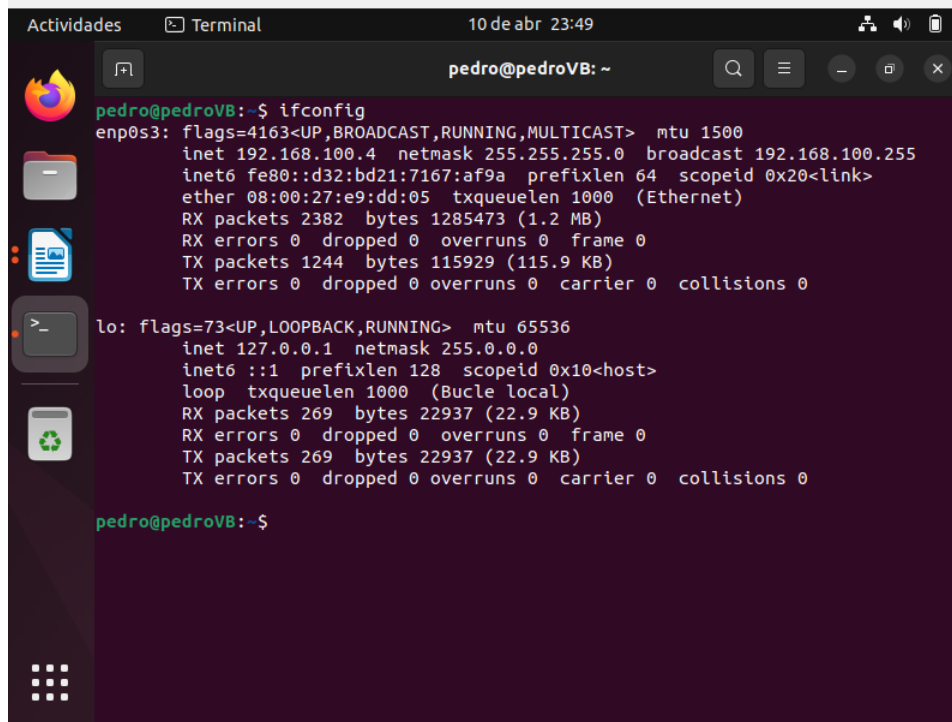
- a) Nombre: UTAD\_NATNetwork
- b) Direcccionamiento (CIDR): 192.168.100.0 /24:
- c) Este será el rango de IPs que se asignarán a las dos máquinas Virtuales
- d) Soporte DHCP
- e) No IPV6

He creado la REDVirtual “NAT\_UTAD” desde la opción Preferencias> RED de VirtualBox.  
Se ha seleccionado el rango indicado “192.168.100.0 /24”.



**EJERCICIO 3.** Cada una de las máquinas virtuales tendrá una IP de forma dinámica del rango 192.168.100.0(se asignará la Red NAT creada a cada máquina).  
Las IP se han asignado por DHCP, comprobamos la IP de cada equipo con el comando ifconfig.

PedroVB – 192.169.100.4

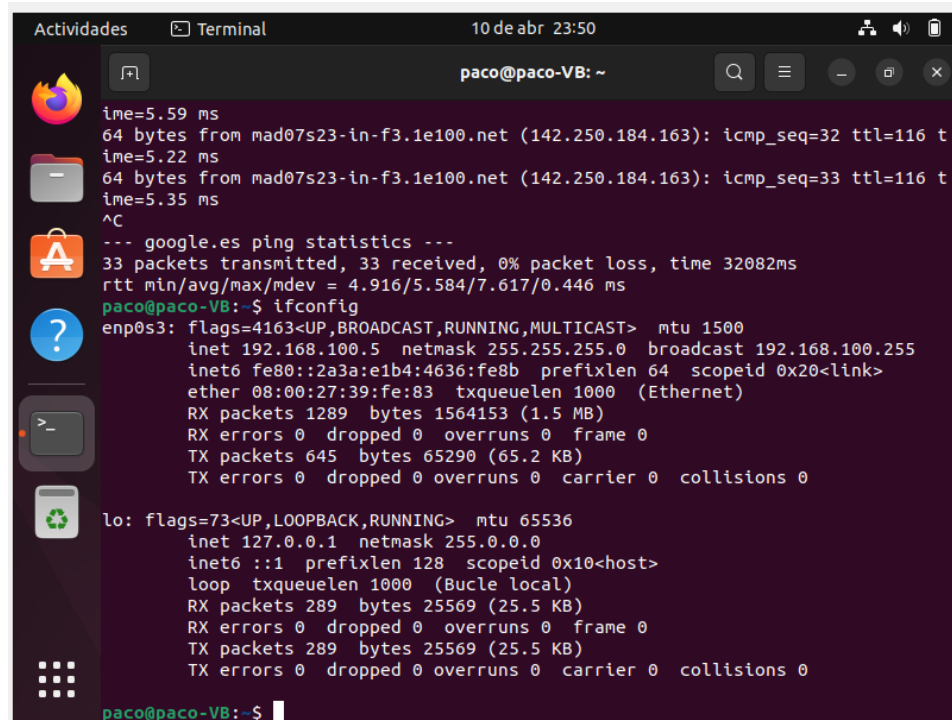


```
Actividades Terminal 10 de abr 23:49
pedro@pedroVB: ~
pedro@pedroVB:~$ ifconfig
enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 192.168.100.4 netmask 255.255.255.0 broadcast 192.168.100.255
    inet6 fe80::d32:bd21:7167:af9a prefixlen 64 scopeid 0x20<link>
    ether 08:00:27:e9:dd:05 txqueuelen 1000 (Ethernet)
    RX packets 2382 bytes 1285473 (1.2 MB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 1244 bytes 115929 (115.9 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
    inet 127.0.0.1 netmask 255.0.0.0
    inet6 ::1 prefixlen 128 scopeid 0x10<host>
    loop txqueuelen 1000 (Bucle local)
    RX packets 269 bytes 22937 (22.9 KB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 269 bytes 22937 (22.9 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

pedro@pedroVB:~$
```

PacoVB – 192.169.100.5



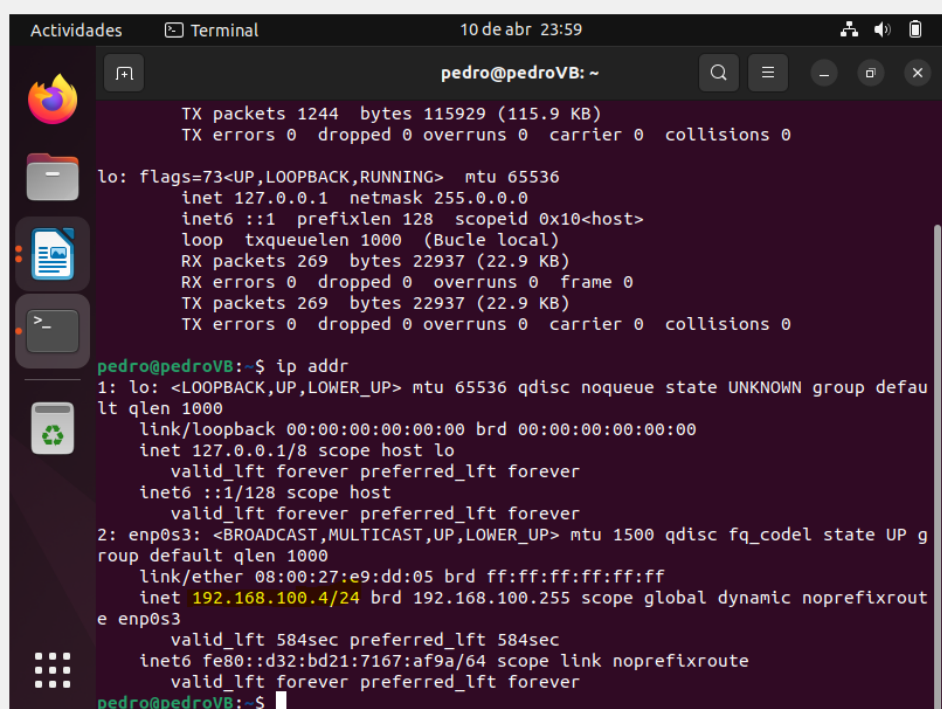
```
Actividades Terminal 10 de abr 23:50
paco@paco-VB: ~
ime=5.59 ms
64 bytes from mad07s23-in-f3.1e100.net (142.250.184.163): icmp_seq=32 ttl=116 t
ime=5.22 ms
64 bytes from mad07s23-in-f3.1e100.net (142.250.184.163): icmp_seq=33 ttl=116 t
ime=5.35 ms
^C
--- google.es ping statistics ---
33 packets transmitted, 33 received, 0% packet loss, time 32082ms
rtt min/avg/max/mdev = 4.916/5.584/7.617/0.446 ms
paco@paco-VB:~$ ifconfig
enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 192.168.100.5 netmask 255.255.255.0 broadcast 192.168.100.255
    inet6 fe80::2a3a:e1b4:4636:fe8b prefixlen 64 scopeid 0x20<link>
    ether 08:00:27:39:fe:83 txqueuelen 1000 (Ethernet)
    RX packets 1289 bytes 1564153 (1.5 MB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 645 bytes 65290 (65.2 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
    inet 127.0.0.1 netmask 255.0.0.0
    inet6 ::1 prefixlen 128 scopeid 0x10<host>
    loop txqueuelen 1000 (Bucle local)
    RX packets 289 bytes 25569 (25.5 KB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 289 bytes 25569 (25.5 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

paco@paco-VB:~$
```

**EJERCICIO 4.** Al arrancar las máquinas, con el comando Linux adecuada verifica la IP que tiene cada una de las máquinas.

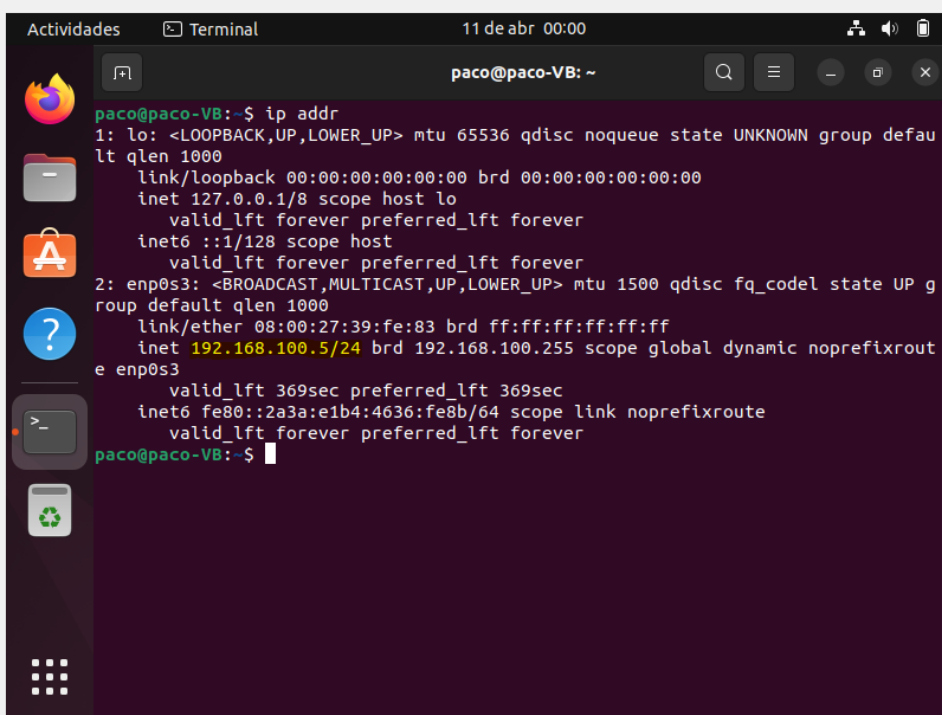
Con el comando “ip addr” también podemos revisar la configuración de red de las maquinas.



```
Actividades Terminal 10 de abr 23:59
pedro@pedroVB: ~
TX packets 1244 bytes 115929 (115.9 KB)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
    inet 127.0.0.1 netmask 255.0.0.0
    inet6 ::1 prefixlen 128 scopeid 0x10<host>
    loop txqueuelen 1000 (Bucle local)
    RX packets 269 bytes 22937 (22.9 KB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 269 bytes 22937 (22.9 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

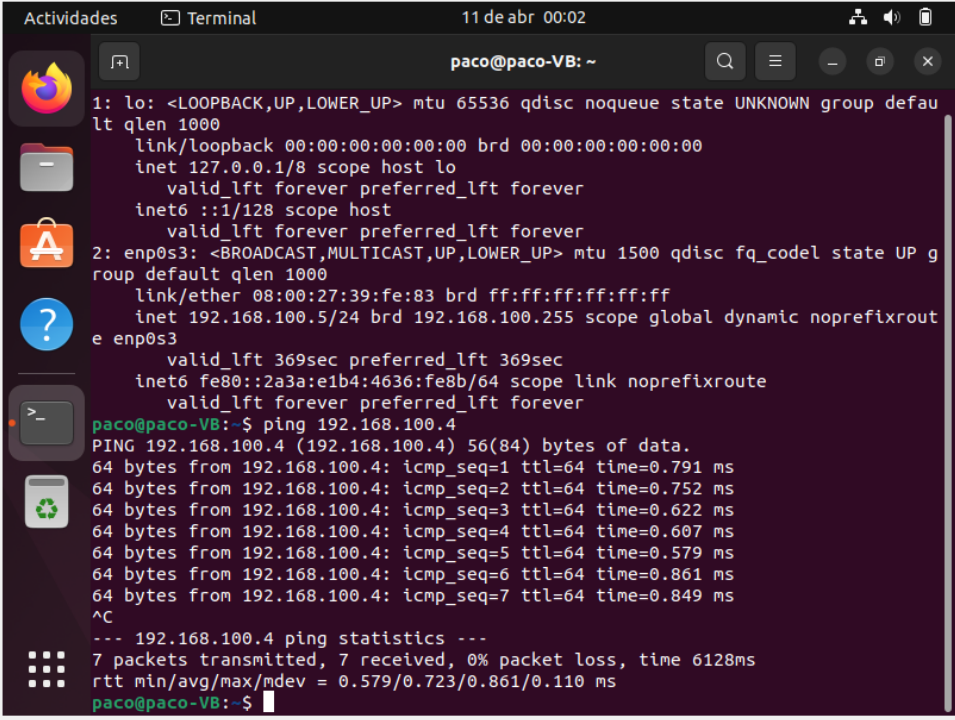
pedro@pedroVB:~$ ip addr
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group defau
lt qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP g
roup default qlen 1000
    link/ether 08:00:27:e9:dd:05 brd ff:ff:ff:ff:ff:ff
    inet 192.168.100.4/24 brd 192.168.100.255 scope global dynamic noprefixrout
e enp0s3
        valid_lft 584sec preferred_lft 584sec
    inet6 fe80::d32:bd21:7167:af9a/64 scope link noprefixroute
        valid_lft forever preferred_lft forever
pedro@pedroVB:~$
```



```
Actividades Terminal 11 de abr 00:00
paco@paco-VB: ~
paco@paco-VB:~$ ip addr
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group defau
lt 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
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP g
roup default qlen 1000
    link/ether 08:00:27:39:fe:83 brd ff:ff:ff:ff:ff:ff
    inet 192.168.100.5/24 brd 192.168.100.255 scope global dynamic noprefixrout
e enp0s3
        valid_lft 369sec preferred_lft 369sec
    inet6 fe80::2a3a:e1b4:4636:fe8b/64 scope link noprefixroute
        valid_lft forever preferred_lft forever
paco@paco-VB:~$
```

**EJERCICIO 5.** Comprobar, según se ha aprendido en la unidad que hay comunicación entre ellas.

Con el comando “ping <IP destino>” realizamos una llamada al host deseado, si responde es que hay conectividad:



```
Actividades Terminal 11 de abr 00:02
paco@paco-VB: ~
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group defau
lt 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
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP g
roup default qlen 1000
    link/ether 08:00:27:39:fe:83 brd ff:ff:ff:ff:ff:ff
    inet 192.168.100.5/24 brd 192.168.100.255 scope global dynamic noprefixrout
e enp0s3
        valid_lft 369sec preferred_lft 369sec
    inet6 fe80::2a3a:e1b4:4636:fe8b/64 scope link noprefixroute
        valid_lft forever preferred_lft forever
paco@paco-VB:~$ ping 192.168.100.4
PING 192.168.100.4 (192.168.100.4) 56(84) bytes of data.
64 bytes from 192.168.100.4: icmp_seq=1 ttl=64 time=0.791 ms
64 bytes from 192.168.100.4: icmp_seq=2 ttl=64 time=0.752 ms
64 bytes from 192.168.100.4: icmp_seq=3 ttl=64 time=0.622 ms
64 bytes from 192.168.100.4: icmp_seq=4 ttl=64 time=0.607 ms
64 bytes from 192.168.100.4: icmp_seq=5 ttl=64 time=0.579 ms
64 bytes from 192.168.100.4: icmp_seq=6 ttl=64 time=0.861 ms
64 bytes from 192.168.100.4: icmp_seq=7 ttl=64 time=0.849 ms
^C
--- 192.168.100.4 ping statistics ---
7 packets transmitted, 7 received, 0% packet loss, time 6128ms
rtt min/avg/max/mdev = 0.579/0.723/0.861/0.110 ms
paco@paco-VB:~$
```

En esta imagen hemos llamado desde la maquina pacoVB (192.168.100.5) a la maquina pedroVB (192.168.100.4) correctamente.

**EJERCICIO 6.** Comprobar que cada una de ellas tienen conectividad con el exterior.

Realizando ping desde cada maquina a la IP google.es verificamos que tengan acceso a internet.

```
Actividades Terminal 11 de abr 00:05
pedro@pedroVB: ~
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP g
roup default qlen 1000
    link/ether 08:00:27:e9:dd:05 brd ff:ff:ff:ff:ff:ff
    inet 192.168.100.4/24 brd 192.168.100.255 scope global dynamic noprefixrou
t e enp0s3
        valid_lft 584sec preferred_lft 584sec
    inet6 fe80::d32:bd21:7167:af9a/64 scope link noprefixroute
        valid_lft forever preferred_lft forever
pedro@pedroVB:~$ ping google.es
PING google.es (142.250.200.131) 56(84) bytes of data:
64 bytes from mad41s14-in-f3.1e100.net (142.250.200.131): icmp_seq=1 ttl=116 ti
me=8.49 ms
64 bytes from mad41s14-in-f3.1e100.net (142.250.200.131): icmp_seq=2 ttl=116 ti
me=5.71 ms
64 bytes from mad41s14-in-f3.1e100.net (142.250.200.131): icmp_seq=3 ttl=116 ti
me=5.56 ms
64 bytes from mad41s14-in-f3.1e100.net (142.250.200.131): icmp_seq=4 ttl=116 ti
me=6.34 ms
64 bytes from mad41s14-in-f3.1e100.net (142.250.200.131): icmp_seq=5 ttl=116 ti
me=5.82 ms
64 bytes from mad41s14-in-f3.1e100.net (142.250.200.131): icmp_seq=6 ttl=116 t
ime=5.74 ms
64 bytes from mad41s14-in-f3.1e100.net (142.250.200.131): icmp_seq=7 ttl=116 ti
me=5.75 ms
^C
--- google.es ping statistics ---
7 packets transmitted, 7 received, 0% packet loss, time 6008ms
rtt min/avg/max/mdev = 5.560/6.201/8.488/0.960 ms
pedro@pedroVB:~$
```

```
Actividades Terminal 11 de abr 00:04
paco@paco-VB: ~
64 bytes from 192.168.100.4: icmp_seq=4 ttl=64 time=0.607 ms
64 bytes from 192.168.100.4: icmp_seq=5 ttl=64 time=0.579 ms
64 bytes from 192.168.100.4: icmp_seq=6 ttl=64 time=0.861 ms
64 bytes from 192.168.100.4: icmp_seq=7 ttl=64 time=0.849 ms
^C
--- 192.168.100.4 ping statistics ---
7 packets transmitted, 7 received, 0% packet loss, time 6128ms
rtt min/avg/max/mdev = 0.579/0.723/0.861/0.110 ms
paco@paco-VB:~$ ping google.es
PING google.es (142.250.184.163) 56(84) bytes of data:
64 bytes from mad07s23-in-f3.1e100.net (142.250.184.163): icmp_seq=1 ttl=116 ti
me=7.33 ms
64 bytes from mad07s23-in-f3.1e100.net (142.250.184.163): icmp_seq=2 ttl=116 ti
me=5.24 ms
64 bytes from mad07s23-in-f3.1e100.net (142.250.184.163): icmp_seq=3 ttl=116 ti
me=5.46 ms
64 bytes from mad07s23-in-f3.1e100.net (142.250.184.163): icmp_seq=4 ttl=116 ti
me=5.77 ms
64 bytes from mad07s23-in-f3.1e100.net (142.250.184.163): icmp_seq=5 ttl=116 ti
me=5.28 ms
64 bytes from mad07s23-in-f3.1e100.net (142.250.184.163): icmp_seq=6 ttl=116 ti
me=5.48 ms
64 bytes from mad07s23-in-f3.1e100.net (142.250.184.163): icmp_seq=7 ttl=116 ti
me=5.39 ms
^C
--- google.es ping statistics ---
7 packets transmitted, 7 received, 0% packet loss, time 6014ms
rtt min/avg/max/mdev = 5.244/5.708/7.334/0.682 ms
paco@paco-VB:~$
```