CONFIGURACIÓN MANUAL DEL ENTORNO DE RED

EJERCICIO 1

```
[root@asrserver cursoasr]# ip link
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN mode
DEFAULT
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP
mode DEFAULT qlen 1000
    link/ether 08:00:27:ce:5e:87 brd ff:ff:ff:ff:ff:ff
3: enp0s8: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP
mode DEFAULT qlen 1000
    link/ether 08:00:27:f8:b0:a5 brd ff:ff:ff:ff:ff:ff
```

Estado de cada interfaz: Activo (UP) o inactivo (DOWN). El nombre de cada interfaz: enp<pci>s<slot> (Ejem: enp0s3 es la controladora ethernet de la controladora pci 0 y slot 3)

```
[root@asrserver cursoasr]# lspci | grep -i ethernet
00:03.0 Ethernet controller: Intel Corporation 82540EM Gigabit Ethernet Controller (rev 02)
00:08.0 Ethernet controller: Intel Corporation 82540EM Gigabit Ethernet Controller (rev 02)
```

EJERCICIO 2

```
ip link set enp0s3 down
ip link set enp0s3 up
```

```
[root@asrserver cursoasr]# ip link set enp0s3 name etherInterface
```

```
[root@asrserver cursoasr]# ip link
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN mode
DEFAULT
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
2: etherInterface: <BROADCAST,MULTICAST> mtu 1500 qdisc pfifo_fast state DOWN mode
DEFAULT qlen 1000
    link/ether 08:00:27:ce:5e:87 brd ff:ff:ff:ff:ff:ff
3: enp0s8: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP
mode DEFAULT qlen 1000
    link/ether 08:00:27:f8:b0:a5 brd ff:ff:ff:ff:ff:ff
```

NOTA: El MTU es la máxima cantidad de bytes que pueden transferirse empleando un determinado protocolo de comunicaciones. Para Ethernet el máximo es 1.500 bytes

```
[root@asrserver cursoasr]# ip link set etherInterface mtu 1500
```

```
[root@asrserver cursoasr]# ip link show etherInterface
2: etherInterface: <BROADCAST,MULTICAST> mtu 1500 qdisc pfifo_fast state DOWN mode
DEFAULT qlen 1000
    link/ether 08:00:27:ce:5e:87 brd ff:ff:ff:ff:ff:ff
```

EJERCICIO 3

```
[root@asrserver cursoasr]# ip addr
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN
    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: etherInterface: <BROADCAST,MULTICAST> mtu 1500 qdisc pfifo_fast state DOWN qlen
1000
    link/ether 08:00:27:ce:5e:87 brd ff:ff:ff:ff:ff:ff
3: enp0s8: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP
qlen 1000
    link/ether 08:00:27:f8:b0:a5 brd ff:ff:ff:ff:ff:ff
    inet 10.0.3.15/24 brd 10.0.3.255 scope global dynamic enp0s8
       valid_lft 83309sec preferred_lft 83309sec
    inet6 fe80::a00:27ff:fef8:b0a5/64 scope link
       valid_lft forever preferred_lft forever

[root@asrserver cursoasr]# ip -4 addr
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN
    inet 127.0.0.1/8 scope host lo
       valid_lft forever preferred_lft forever
3: enp0s8: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP
qlen 1000
    inet 10.0.3.15/24 brd 10.0.3.255 scope global dynamic enp0s8
       valid_lft 82522sec preferred_lft 82522sec

[root@asrserver cursoasr]# ip -6 addr
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536
    inet6 ::1/128 scope host
       valid_lft forever preferred_lft forever
3: enp0s8: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qlen 1000
    inet6 fe80::a00:27ff:fef8:b0a5/64 scope link
       valid_lft forever preferred_lft forever

[root@asrserver Desktop]# ip link
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN mode
DEFAULT
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
2: enp0s3: <BROADCAST,MULTICAST> mtu 1500 qdisc pfifo_fast state DOWN mode
DEFAULT qlen 1000
    link/ether 08:00:27:ce:5e:87 brd ff:ff:ff:ff:ff:ff
3: enp0s8: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP
mode DEFAULT qlen 1000
    link/ether 08:00:27:f8:b0:a5 brd ff:ff:ff:ff:ff:ff
```

EJERCICIO 4

ip address add 192.168.0.1/24 dev enp0s3 → ROUTER

ip address add 192.168.0.2/24 dev enp0s3 → SERVER

EJERCICIO 5

ROUTER

[root@asrserver Desktop]# ip link set enp0s3 up

[root@asrserver Desktop]# ip route
default via 10.0.3.2 dev enp0s8 proto static metric 100
10.0.3.0/24 dev enp0s8 proto kernel scope link src 10.0.3.15 metric 100
192.168.0.0/24 dev enp0s3 proto kernel scope link src 192.168.0.1

SERVER

[root@asrserver Desktop]# ip link set enp0s3 up

[root@asrserver Desktop]# ip route
192.168.0.0/24 dev enp0s3 proto kernel scope link src 192.168.0.2

EJERCICIO 6

ROUTER

[root@asrserver Desktop]# ping -c 4 192.168.2
PING 192.168.2 (192.168.0.2) 56(84) bytes of data.
64 bytes from 192.168.0.2: icmp_seq=1 ttl=64 time=0.308 ms
64 bytes from 192.168.0.2: icmp_seq=2 ttl=64 time=0.285 ms
64 bytes from 192.168.0.2: icmp_seq=3 ttl=64 time=0.294 ms
64 bytes from 192.168.0.2: icmp_seq=4 ttl=64 time=0.297 ms
--- 192.168.2 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3001ms
rtt min/avg/max/mdev = 0.285/0.296/0.308/0.008 ms

SERVER

[root@asrserver Desktop]# ping -c 4 192.168.0.1
PING 192.168.0.1 (192.168.0.1) 56(84) bytes of data.
64 bytes from 192.168.0.1: icmp_seq=1 ttl=64 time=0.274 ms
64 bytes from 192.168.0.1: icmp_seq=2 ttl=64 time=0.312 ms
64 bytes from 192.168.0.1: icmp_seq=3 ttl=64 time=0.310 ms
64 bytes from 192.168.0.1: icmp_seq=4 ttl=64 time=0.278 ms
--- 192.168.0.1 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3000ms
rtt min/avg/max/mdev = 0.274/0.293/0.312/0.024 ms

EJERCICIO 7

ROUTER

[root@asrserver Desktop]# ip neigh
192.168.0.2 dev enp0s3 lladdr 08:00:27:8b:39:f4 STALE

SERVER

[root@asrserver Desktop]# ip link
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN mode DEFAULT
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP mode DEFAULT qlen 1000
    link/ether 08:00:27:8b:39:f4 brd ff:ff:ff:ff:ff:ff

EJERCICIO 8

ROUTER

```
[root@asrserver Desktop]# ip neigh flush all
[root@asrserver Desktop]# ip nei
10.0.3.2 dev enp0s8  FAILED
192.168.0.2 dev enp0s3  FAILED

[root@asrserver Desktop]# ping -c 4 192.168.0.2
PING 192.168.0.2 (192.168.0.2) 56(84) bytes of data.
64 bytes from 192.168.0.2: icmp_seq=1 ttl=64 time=0.515 ms
64 bytes from 192.168.0.2: icmp_seq=2 ttl=64 time=0.311 ms
64 bytes from 192.168.0.2: icmp_seq=3 ttl=64 time=0.324 ms
64 bytes from 192.168.0.2: icmp_seq=4 ttl=64 time=0.301 ms

--- 192.168.0.2 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3001ms
rtt min/avg/max/mdev = 0.301/0.362/0.515/0.091 ms
```

SERVER

```
[root@asrserver Desktop]# tcpdump -i enp0s3
tcpdump: verbose output suppressed, use -v or -vv for full protocol decode
listening on enp0s3, link-type EN10MB (Ethernet), capture size 65535 bytes
18:33:43.011892 ARP, Request who-has 192.168.0.2 tell 192.168.0.1, length 46
18:33:43.011915 ARP, Reply 192.168.0.2 is-at 08:00:27:8b:39:f4 (oui Unknown), length 28
18:33:43.012072 IP 192.168.0.1 > 192.168.0.2: ICMP echo request, id 7016, seq 1, length 64
18:33:43.012152 IP 192.168.0.2 > 192.168.0.1: ICMP echo reply, id 7016, seq 1, length 64
18:33:44.012337 IP 192.168.0.1 > 192.168.0.2: ICMP echo request, id 7016, seq 2, length 64
18:33:44.012382 IP 192.168.0.2 > 192.168.0.1: ICMP echo reply, id 7016, seq 2, length 64
18:33:45.012720 IP 192.168.0.1 > 192.168.0.2: ICMP echo request, id 7016, seq 3, length 64
18:33:45.012759 IP 192.168.0.2 > 192.168.0.1: ICMP echo reply, id 7016, seq 3, length 64
18:33:46.011856 IP 192.168.0.1 > 192.168.0.2: ICMP echo request, id 7016, seq 4, length 64
18:33:46.011899 IP 192.168.0.2 > 192.168.0.1: ICMP echo reply, id 7016, seq 4, length 64
18:33:48.176522 ARP, Request who-has 192.168.0.1 tell 192.168.0.2, length 28
18:33:48.176755 ARP, Reply 192.168.0.1 is-at 08:00:27:ce:5e:87 (oui Unknown), length 46
^C
12 packets captured
12 packets received by filter
0 packets dropped by kernel
```

ARCHIVOS DE CONFIGURACIÓN DE RED

EJERCICIO 1

ROUTER

```
[root@asrserver Desktop]# systemctl status network
● network.service - LSB: Bring up/down networking
   Loaded: loaded (/etc/rc.d/init.d/network)
   Active: active (exited) since Sat 2018-05-12 12:51:29 CEST; 3min 19s ago
     Docs: man:systemd-sysv-generator(8)
  Process: 678 ExecStart=/etc/rc.d/init.d/network start (code=exited, status=0/SUCCESS)

May 12 12:51:29 asrserver systemd[1]: Starting LSB: Bring...
May 12 12:51:29 asrserver network[678]: Bringing up loopb...
May 12 12:51:29 asrserver systemd[1]: Started LSB: Bring ...
Hint: Some lines were ellipsized, use -l to show in full.
```

SERVER

```
[root@asrserver Desktop]# systemctl status network
● network.service - LSB: Bring up/down networking
   Loaded: loaded (/etc/rc.d/init.d/network)
   Active: active (exited) since Sat 2018-05-12 12:52:13 CEST; 2min 30s ago
     Docs: man:systemd-sysv-generator(8)
  Process: 678 ExecStart=/etc/rc.d/init.d/network start (code=exited, status=0/SUCCESS)

May 12 12:52:13 asrserver systemd[1]: Starting LSB: Bring...
May 12 12:52:13 asrserver network[678]: Bringing up loopb...
May 12 12:52:13 asrserver systemd[1]: Started LSB: Bring ...
Hint: Some lines were ellipsized, use -l to show in full.
```

EJERCICIO 2

ROUTER

[root@asrserver ~]# cd /etc/sysconfig/network-scripts/

[root@asrserver network-scripts]# vim ifcfg-enp0s3
DEVICE=enp0s3
BOOTPROTO=none
ONBOOT=yes
NETWORK=192.168.0.0
NETMASK=255.255.255.0
IPADDR=192.168.0.1

[root@asrserver network-scripts]# ifup enp0s3

[root@asrserver network-scripts]# vim ifcfg-enp0s8
# DEVICE=enp0s8
# BOOTPROTO=none
# ONBOOT=yes
# NETWORK=10.0.3.0
# NETMASK=255.255.255.0
# IPADDR=10.0.3.15
DEVICE=enp0s8
BOOTPROTO=dhcp
ONBOOT=yes

[root@asrserver network-scripts]# ifup enp0s8

SERVER

[root@asrserver ~]# cd /etc/sysconfig/network-scripts/

[root@asrserver network-scripts]# vim ifcfg-enp0s3
DEVICE=enp0s3
BOOTPROTO=none
ONBOOT=yes
NETWORK=192.168.0.0
NETMASK=255.255.255.0
IPADDR=192.168.0.2

[root@asrserver network-scripts]# ifup enp0s3

RESOLUCIÓN DE NOMBRES

EJERCICIO 1

ROUTER

[root@asrserver network-scripts]# vim /etc/resolv.conf

search Home
nameserver 80.58.61.250
nameserver 80.58.61.254

Google
nameserver 8.8.8.8
nameserver 8.8.4.4

[root@asrserver network-scripts]# host www.google.com
www.google.com has address 172.217.18.36
www.google.com has IPv6 address 2a00:1450:4006:805::2004

EJERCICIO 2

ROUTER

```
[root@asrserver network-scripts]# vim /etc/hosts
127.0.0.1   localhost localhost.localdomain localhost4 localhost4.localdomain4
::1         localhost localhost.localdomain localhost6 localhost6.localdomain6
192.168.0.2 server

[root@asrserver network-scripts]# ping -c 4 server
PING server (192.168.0.2) 56(84) bytes of data.
64 bytes from server (192.168.0.2): icmp_seq=1 ttl=64 time=0.502 ms
64 bytes from server (192.168.0.2): icmp_seq=2 ttl=64 time=0.287 ms
64 bytes from server (192.168.0.2): icmp_seq=3 ttl=64 time=0.265 ms
64 bytes from server (192.168.0.2): icmp_seq=4 ttl=64 time=0.312 ms

--- server ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 2999ms
rtt min/avg/max/mdev = 0.265/0.341/0.502/0.095 ms
```

SERVER

```
[root@asrserver network-scripts]# vim /etc/hosts
127.0.0.1   localhost localhost.localdomain localhost4 localhost4.localdomain4
::1         localhost localhost.localdomain localhost6 localhost6.localdomain6
192.168.0.1 router

[root@asrserver Desktop]# ping -c 4 router
PING router (192.168.0.1) 56(84) bytes of data.
64 bytes from router (192.168.0.1): icmp_seq=1 ttl=64 time=0.346 ms
64 bytes from router (192.168.0.1): icmp_seq=2 ttl=64 time=0.312 ms
64 bytes from router (192.168.0.1): icmp_seq=3 ttl=64 time=0.300 ms
64 bytes from router (192.168.0.1): icmp_seq=4 ttl=64 time=0.308 ms

--- router ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3027ms
rtt min/avg/max/mdev = 0.300/0.316/0.346/0.025 ms
```

CONFIGURACIÓN DINÁMICA DE LA RED

EJERCICIO 1

ROUTER

```
[root@asrserver Desktop]# systemctl stop --now firewalld.service

[root@asrserver Desktop]# vim /etc/dnsmasq.conf
…
dhcp-range=192.168.0.100,192.168.0.150,255.255.255.0,12h
…

[root@asrserver Desktop]# systemctl restart dnsmasq.service
```

EJERCICIO 2

SERVER

[root@asrserver Desktop]# ip link set enp0s3 down

[root@asrserver Desktop]# dhclient -v enp0s3
Internet Systems Consortium DHCP Client 4.2.5
Copyright 2004-2013 Internet Systems Consortium.
All rights reserved.
For info, please visit https://www.isc.org/software/dhcp/

Listening on LPF/enp0s3/08:00:27:8b:39:f4
Sending on   LPF/enp0s3/08:00:27:8b:39:f4
Sending on   Socket/fallback
DHCPDISCOVER on enp0s3 to 255.255.255.255 port 67 interval 7 (xid=0x7f251138)
DHCPREQUEST on enp0s3 to 255.255.255.255 port 67 (xid=0x7f251138)
DHCPOFFER from 192.168.0.1
DHCPACK from 192.168.0.1 (xid=0x7f251138)
bound to 192.168.0.127 -- renewal in 19604 seconds.

EJERCICIO 3

SERVER

TERMINAL 1

[root@asrserver Desktop]# cd /etc/sysconfig/network-scripts/

[root@asrserver network-scripts]# vim ifcfg-enp0s3
#DEVICE=enp0s3
#BOOTPROTO=none
#ONBOOT=yes
#NETWORK=192.168.0.0
#NETMASK=255.255.255.0
#IPADDR=192.168.0.2
DEVICE=enp0s3
BOOTPROTO=dhcp
ONBOOT=yes

[root@asrserver network-scripts]# ifdown enp0s3

[root@asrserver network-scripts]# tcpdump -i enp0s3 -n port 67 and port 68

tcpdump: WARNING: enp0s3: no IPv4 address assigned
tcpdump: verbose output suppressed, use -v or -vv for full protocol decode
listening on enp0s3, link-type EN10MB (Ethernet), capture size 65535 bytes

…
Ahora en el segundo terminal lanzamos la configuración DHCP del interfaz enp0s3.
…

14:29:08.332362 IP 0.0.0.0.bootpc > 255.255.255.255.bootps: BOOTP/DHCP, Request from 08:00:27:8b:39:f4, length 300
14:29:08.334934 IP 192.168.0.1.bootps > 192.168.0.127.bootpc: BOOTP/DHCP, Reply, length 303
^C
2 packets captured
2 packets received by filter
0 packets dropped by kernel

TERMINAL 2

[root@asrserver network-scripts]# ifup enp0s3
Determining IP information for enp0s3... done.

EJERCICIO 4

```
[root@asrserver network-scripts]# ping -c 4 router
PING router (192.168.0.1) 56(84) bytes of data.
64 bytes from router (192.168.0.1): icmp_seq=1 ttl=64 time=0.227 ms
64 bytes from router (192.168.0.1): icmp_seq=2 ttl=64 time=0.278 ms
64 bytes from router (192.168.0.1): icmp_seq=3 ttl=64 time=0.270 ms
64 bytes from router (192.168.0.1): icmp_seq=4 ttl=64 time=0.294 ms

--- router ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3000ms
rtt min/avg/max/mdev = 0.227/0.267/0.294/0.027 ms

[root@asrserver network-scripts]# ping -c 4 www.google.com
PING www.google.com (172.217.18.228) 56(84) bytes of data.

--- www.google.com ping statistics ---
4 packets transmitted, 0 received, 100% packet loss, time 2999ms
```

NOTAS:

- Para que SERVER se pueda conectar habría que configurar ROUTER para que se conecte.
- El ping no funciona con ROUTER hacia fuera de la red por que VirtualBox no está configurado en la máquina anfitriona al completo.

MONITORIZACIÓN DE LA RED

EJERCICIO 1

ROUTER

```
[root@asrserver Desktop]# ip -s link

1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN mode
DEFAULT
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    RX: bytes  packets  errors  dropped overrun mcast
    0          0        0       0       0       0
    TX: bytes  packets  errors  dropped carrier collsns
    0          0        0       0       0       0
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP
mode DEFAULT qlen 1000
    link/ether 08:00:27:06:90:f7 brd ff:ff:ff:ff:ff:ff
    RX: bytes  packets  errors  dropped overrun mcast
    7343       25       0       0       0       9
    TX: bytes  packets  errors  dropped carrier collsns
    3893       26       0       0       0       0
3: enp0s8: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP
mode DEFAULT qlen 1000
    link/ether 08:00:27:1b:b3:b4 brd ff:ff:ff:ff:ff:ff
    RX: bytes  packets  errors  dropped overrun mcast
```

590 1 0 0 0 0
TX: bytes packets errors dropped carrier collsns
3885 22 0 0 0 0

EJERCICIO 2

ROUTER

[root@asrserver Desktop]# ss -ta

State	Recv-Q	Send-Q	Local Address:Port	Peer Address:Port
LISTEN	0	128	*:ssh	*:*
LISTEN	0	128	127.0.0.1:ipp	*:*
LISTEN	0	100	127.0.0.1:smtp	*:*
LISTEN	0	128	:::ssh	:::*
LISTEN	0	128	::1:ipp	:::*
LISTEN	0	100	::1:smtp	:::*

[root@asrserver Desktop]# ss -ua

State	Recv-Q	Send-Q	Local Address:Port	Peer Address:Port
UNCONN	0	0	*:41885	*:*
UNCONN	0	0	*:bootpc	*:*
UNCONN	0	0	*:mdns	*:*
UNCONN	0	0	*:46603	*:*
UNCONN	0	0	:::62038	:::*

[root@asrserver Desktop]# lsof -i

COMMAND	PID	USER	FD	TYPE	DEVICE	SIZE/OFF	NODE	NAME
avahi-dae	540	avahi	12u	IPv4	15387	0t0	UDP	*:mdns
avahi-dae	540	avahi	13u	IPv4	15388	0t0	UDP	*:46603
dhclient	1311	root	6u	IPv4	17797	0t0	UDP	*:bootpc
dhclient	1311	root	20u	IPv4	17769	0t0	UDP	*:41885
dhclient	1311	root	21u	IPv6	17770	0t0	UDP	*:62038
cupsd	1388	root	12u	IPv6	17272	0t0	TCP	localhost:ipp (LISTEN)
cupsd	1388	root	13u	IPv4	17273	0t0	TCP	localhost:ipp (LISTEN)
sshd	1393	root	3u	IPv4	18488	0t0	TCP	*:ssh (LISTEN)
sshd	1393	root	4u	IPv6	18490	0t0	TCP	*:ssh (LISTEN)
master	1506	root	13u	IPv4	20089	0t0	TCP	localhost:smtp (LISTEN)
master	1506	root	14u	IPv6	20090	0t0	TCP	localhost:smtp (LISTEN)

EJERCICIO 3

ROUTER

[root@asrserver Desktop]# ss -tan

State	Recv-Q	Send-Q	Local Address:Port	Peer Address:Port
LISTEN	0	128	*:22	*:*
LISTEN	0	128	127.0.0.1:631	*:*
LISTEN	0	100	127.0.0.1:25	*:*

```
LISTEN     0      128                :::22                      :::*
LISTEN     0      128                ::1:631                    :::*
LISTEN     0      100                ::1:25                     :::*
```

La correspondencia con /etc/services es correcta.
ACCESO REMOTO SEGURO

EJERCICIO 1

SERVER

```
[root@asrserver Desktop]# systemctl status sshd
● sshd.service - OpenSSH server daemon
   Loaded: loaded (/usr/lib/systemd/system/sshd.service; enabled; vendor preset: enabled)
   Active: active (running) since Mon 2018-05-14 10:39:10 CEST; 2h 45min ago
     Docs: man:sshd(8)
           man:sshd_config(5)
 Main PID: 1182 (sshd)
   CGroup: /system.slice/sshd.service
           └─1182 /usr/sbin/sshd -D

May 14 10:39:10 asrserver systemd[1]: Started OpenSSH server daemon.
May 14 10:39:10 asrserver systemd[1]: Starting OpenSSH server daemon...
May 14 10:39:10 asrserver sshd[1182]: Server listening on 0.0.0.0 port 22.
May 14 10:39:10 asrserver sshd[1182]: Server listening on :: port 22.
```

EJERCICIO 2

```
[root@asrserver Desktop]# ssh root@server

The authenticity of host 'server (192.168.0.2)' can't be established.
ECDSA key fingerprint is 93:35:53:54:13:cc:21:c8:81:b9:d8:59:fa:e6:b7:94.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added 'server,192.168.0.2' (ECDSA) to the list of known hosts.
root@server's password:
Last login: Mon May 14 10:42:28 2018
```

EJERCICIO 3

ROUTER

```
[root@asrserver ~]# scp prueba root@server:/home/cursoasr/Desktop/prueba
The authenticity of host 'server (192.168.0.2)' can't be established.
ECDSA key fingerprint is 93:35:53:54:13:cc:21:c8:81:b9:d8:59:fa:e6:b7:94.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added 'server' (ECDSA) to the list of known hosts.
root@server's password:
prueba                                        100%   11     0.0KB/s   00:00
```

SERVER

```
[root@asrserver Desktop]# ls
```

prueba

EJERCICIO 4

ROUTER

```
[root@asrserver Desktop]# ssh-keygen
Generating public/private rsa key pair.
Enter file in which to save the key (/root/.ssh/id_rsa):
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /root/.ssh/id_rsa.
Your public key has been saved in /root/.ssh/id_rsa.pub.
The key fingerprint is:
1c:78:a2:0e:eb:db:7d:4a:9c:52:e8:6b:9e:1a:6d:a8 root@asrserver
The key's randomart image is:
+--[ RSA 2048]----+
|                 |
|      .          |
|     o o         |
|    o + .        |
| . o . S         |
|  B o .          |
| + * +           |
|o +.*  .         |
|E +== oo         |
+-----------------+

[root@asrserver Desktop]# cd ~

[root@asrserver ~]# ssh-copy-id -i .ssh/id_rsa.pub root@server
/usr/bin/ssh-copy-id: INFO: attempting to log in with the new key(s), to filter out any that are
already installed
/usr/bin/ssh-copy-id: INFO: 1 key(s) remain to be installed -- if you are prompted now it is to install
the new keys
root@server's password:

Number of key(s) added: 1

Now try logging into the machine, with:   "ssh 'root@server'"
and check to make sure that only the key(s) you wanted were added.

[root@asrserver ~]# ssh 'root@server'
Last login: Mon May 14 16:26:27 2018 from router
```

SERVER

```
[root@asrserver ~]# cd .ssh
[root@asrserver .ssh]# cat auth*
ssh-rsa
AAAAB3NzaC1yc2EAAAADAQABAAABAQDK6xtRn2mHfoZ0EwpyDxbf2vI+JFS71cc83QHp
OAY5/D4hD8uRsHP7XVJYvemComa4kj/VeE3mbGqvVR1PxnEaXyI31YSAqZ1B0V4fdxO/
CclyFFVJkjLKev/aI4o/A1mTNgKsJ1u08Hb5w+zpCkdXwx+Sjmi7+6wMzDOvXA22DDVEZIJQ/
1KEbajiNCWQETgLa25XMZWysPa7qTUOin+VkGgFMPW7l5qBdNiU0xRrepiKH0Duo454BkG
WWUhwKrOTPGoGESfI3Vz0I/u6LEtVR4r66Cq/
dqk7ofaNKf5x1KguhzGQOYncZuVpZQgRYgRJIdqa3rTDrVtGNw9xJu0d root@asrserver

[root@asrserver ~]# ls -la
total 68
dr-xr-x---.  6 root root 4096 May 14 16:15 .
dr-xr-xr-x. 17 root root 4096 Feb 10  2016 ..
-rw-------.  1 root root 1715 Feb 10  2016 anaconda-ks.cfg
-rw-------.  1 root root 6368 May 14 16:18 .bash_history
-rw-r--r--.  1 root root   18 Dec 29  2013 .bash_logout
-rw-r--r--.  1 root root  176 Dec 29  2013 .bash_profile
-rw-r--r--.  1 root root  176 Dec 29  2013 .bashrc
drwxr-xr-x.  3 root root   17 Feb 10  2016 .cache
drwxr-xr-x.  5 root root   43 May 14 14:24 .config
-rw-r--r--.  1 root root  100 Dec 29  2013 .cshrc
-rw-------.  1 root root 1763 Feb 10  2016 initial-setup-ks.cfg
-rw-------.  1 root root   53 May 13 13:21 .lesshst
drwxr-xr-x.  3 root root   18 May 14 14:23 .local
drwx------.  2 root root   46 May 14 16:25 .ssh
-rw-r--r--.  1 root root  129 Dec 29  2013 .tcshrc
-rw-------.  1 root root 4725 May 14 14:23 .viminfo
-rw-------.  1 root root  108 May  7 09:14 .xauth4uVxm1
-rw-------.  1 root root  108 Apr 27 22:59 .xauthR1kt1S
-rw-------.  1 root root  108 May 14 13:38 .xauthXyTJPF

[root@asrserver .ssh]# ls -la
total 12
drwx------. 2 root root   46 May 14 16:25 .
dr-xr-x---. 6 root root 4096 May 14 16:15 ..
-rw-------. 1 root root  792 May 14 16:35 authorized_keys
-rw-r--r--. 1 root root  341 May 14 14:12 known_hosts

[root@asrserver .ssh]# lsof -i
COMMAND     PID  USER   FD   TYPE DEVICE SIZE/OFF NODE NAME
avahi-dae   541 avahi   12u  IPv4  15923      0t0  UDP *:mdns
avahi-dae   541 avahi   13u  IPv4  15924      0t0  UDP *:45323
cupsd      1186  root   12u  IPv6  17992      0t0  TCP localhost:ipp (LISTEN)
cupsd      1186  root   13u  IPv4  17993      0t0  TCP localhost:ipp (LISTEN)
```

```
master    1302  root   13u  IPv4  19387      0t0  TCP localhost:smtp (LISTEN)
master    1302  root   14u  IPv6  19388      0t0  TCP localhost:smtp (LISTEN)
sshd     17891  root    3u  IPv4  70021      0t0  TCP *:ssh (LISTEN)
sshd     17891  root    4u  IPv6  70023      0t0  TCP *:ssh (LISTEN)
sshd     19497  root    3u  IPv4  76990      0t0  TCP server:ssh->router:36661 (ESTABLISHED)
```

EJERCICIO 5

SERVER

```
[root@asrserver Desktop]# vim /etc/ssh/sshd_config
PermitRootLogin no

[root@asrserver Desktop]# systemctl restart sshd
```

ROUTER

```
[root@asrserver Desktop]# ssh root@server
root@server's password:
Permission denied, please try again.
root@server's password:
Permission denied, please try again.
root@server's password:
```