

Crear tres máquinas CentOS7, con conexión entre las mismas a través de dos redes locales internas:



```
+++++
(letiZia)
==> 192.168.1.10
+++++
```



```
+++++
(chipi)
==> 192.168.1.20
==> 192.168.4.20
+++++
```



```
+++++
(gasper)
==> 192.168.4.30
+++++
```



Como se puede observar: '**letiZia**' y '**chipi**' están conectados a través de la subred **192.168.1.0/24**. '**chipi**' y '**gasper**' están conectados por la subred **192.168.4.0/24**.

Se debe configurar '**chipi**' de tal forma que permita la conexión desde '**letiZia**' al puerto **SSH (22)** de '**gasper**', a través del puerto **2244 local**.

En '**gasper**' sólo estará permitido el tráfico de los servicios autorizados. El resto se bloqueará por defecto.

ENTREGA:

Ficheros *Vagrantfile* para crear las máquinas, y opcionalmente los scripts de aprovisionamiento. Fichero de configuración de [iptables](#) de '**chipi**' (exportado). Cualquier configuración adicional necesaria en '**letiZia**' y '**gasper**'.

↓ ↓ ==> Vagrantfile:

```
Vagrant.configure("2") do |config|
    config.vm.define "letiZia" do |centos|
        centos.vm.box = "centos/7"
        centos.vm.hostname = "letiZia"
        centos.vm.network "private_network", ip: "192.168.1.10", virtualbox__intnet: "intnet"
    end
    config.vm.provision "shell", inline: "echo 'letiZia - Miauuuuu.....'"
    config.vm.define "chipi" do |centos|
        centos.vm.box = "centos/7"
        centos.vm.hostname = "chipi"
        centos.vm.network "private_network", ip: "192.168.1.20", virtualbox__intnet: "intnet"
        centos.vm.network "private_network", ip: "192.168.4.20", virtualbox__intnet: "intnet2"
    end
    config.vm.provision "shell", inline: "echo 'chipi - Maramiauuuuu....'"
    config.vm.define "gasper" do |centos|
        centos.vm.box = "centos/7"
        centos.vm.hostname = "gasper"
        centos.vm.network "private_network", ip: "192.168.4.30", virtualbox__intnet: "intnet2"
    end
    config.vm.provision "shell", inline: "echo 'gasper - Miaumiauuuuu.....'"
end
```

[labs@hp LABORATORIO-02]\$ vagrant up

...

[labs@hp LABORATORIO-02]\$ vagrant status

Current machine states:

letiZia	running (virtualbox)
chipi	running (virtualbox)
gasper	running (virtualbox)



```
[labs@hp LABORATORIO-02]$ vagrant ssh letiZia
[vagrant@letiZia ~]$ ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN qlen 1
    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: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP qlen 1000
    link/ether 52:54:00:7a:69:5a brd ff:ff:ff:ff:ff:ff
    inet 10.0.2.15/24 brd 10.0.2.255 scope global dynamic eth0
        valid_lft 86138sec preferred_lft 86138sec
    inet6 fe80::5054:ff:fe7a:695a/64 scope link
        valid_lft forever preferred_lft forever
3: eth1: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP qlen 1000
    link/ether 08:00:27:d8:86:8f brd ff:ff:ff:ff:ff:ff
    inet 192.168.1.10/24 brd 192.168.1.255 scope global eth1
        valid_lft forever preferred_lft forever
    inet6 fe80::a00:27ff:fed8:868f/64 scope link
        valid_lft forever preferred_lft forever
```



```
[labs@hp LABORATORIO-02]$ vagrant ssh chipi
[vagrant@chipi ~]$ ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN qlen 1
    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: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP qlen 1000
    link/ether 52:54:00:7a:69:5a brd ff:ff:ff:ff:ff:ff
    inet 10.0.2.15/24 brd 10.0.2.255 scope global dynamic eth0
        valid_lft 86121sec preferred_lft 86121sec
    inet6 fe80::5054:ff:fe7a:695a/64 scope link
        valid_lft forever preferred_lft forever
3: eth1: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP qlen 1000
    link/ether 08:00:27:2a:ad:a7 brd ff:ff:ff:ff:ff:ff
    inet 192.168.1.20/24 brd 192.168.1.255 scope global eth1
        valid_lft forever preferred_lft forever
    inet6 fe80::a00:27ff:fe2a:ada7/64 scope link
```

```

valid_lft forever preferred_lft forever
4: eth2: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP qlen
1000
    link/ether 08:00:27:c2:25:2b brd ff:ff:ff:ff:ff:ff
    inet 192.168.4.20/24 brd 192.168.4.255 scope global eth2
        valid_lft forever preferred_lft forever
        inet6 fe80::a00:27ff:fec2:252b/64 scope link
            valid_lft forever preferred_lft forever

```



[labs@hp LABORATORIO-02]\$ vagrant ssh gasper
[vagrant@gasper ~]\$ ip a

```

1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN qlen 1
    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: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP qlen
1000
    link/ether 52:54:00:7a:69:5a brd ff:ff:ff:ff:ff:ff
    inet 10.0.2.15/24 brd 10.0.2.255 scope global dynamic eth0
        valid_lft 86048sec preferred_lft 86048sec
        inet6 fe80::5054:ff:fe7a:695a/64 scope link
            valid_lft forever preferred_lft forever
3: eth1: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP qlen
1000
    link/ether 08:00:27:50:67:99 brd ff:ff:ff:ff:ff:ff
    inet 192.168.4.30/24 brd 192.168.4.255 scope global eth1
        valid_lft forever preferred_lft forever
        inet6 fe80::a00:27ff:fe50:6799/64 scope link
            valid_lft forever preferred_lft forever

```



↙ ↘ => En los 3 respectivos → '/etc/hosts':

```

192.168.1.10  letiZia
192.168.1.20  chipi
192.168.4.20  chipi
192.168.4.30  gasper

```

**[root@letiZia vagrant]# ping -c3 letiZia**

PING letiZia (127.0.0.1) 56(84) bytes of data.
64 bytes from letiZia (127.0.0.1): icmp_seq=1 ttl=64 time=0.013 ms
64 bytes from letiZia (127.0.0.1): icmp_seq=2 ttl=64 time=0.050 ms
64 bytes from letiZia (127.0.0.1): icmp_seq=3 ttl=64 time=0.049 ms

--- letiZia ping statistics ---

3 packets transmitted, 3 received, 0% packet loss, time 2000ms
rtt min/avg/max/mdev = 0.013/0.037/0.050/0.017 ms

[root@letiZia vagrant]# ping -c3 chipi

PING chipi (192.168.1.20) 56(84) bytes of data.
64 bytes from chipi (192.168.1.20): icmp_seq=1 ttl=64 time=0.417 ms
64 bytes from chipi (192.168.1.20): icmp_seq=2 ttl=64 time=0.575 ms
64 bytes from chipi (192.168.1.20): icmp_seq=3 ttl=64 time=0.747 ms

--- chipi ping statistics ---

3 packets transmitted, 3 received, 0% packet loss, time 2018ms
rtt min/avg/max/mdev = 0.417/0.579/0.747/0.137 ms

[root@letiZia vagrant]# ping -c3 gasper

PING gasper (192.168.4.30) 56(84) bytes of data.
^C

--- gasper ping statistics ---

3 packets transmitted, 0 received, 100% packet loss, time 2018ms

**[root@chipy vagrant]# ping -c3 chipi**

PING chipi (127.0.0.1) 56(84) bytes of data.
64 bytes from chipi (127.0.0.1): icmp_seq=1 ttl=64 time=0.011 ms
64 bytes from chipi (127.0.0.1): icmp_seq=2 ttl=64 time=0.050 ms
64 bytes from chipi (127.0.0.1): icmp_seq=3 ttl=64 time=0.050 ms

--- chipi ping statistics ---

3 packets transmitted, 3 received, 0% packet loss, time 2001ms
rtt min/avg/max/mdev = 0.011/0.037/0.050/0.018 ms

[root@chipy vagrant]# ping -c3 letiZia

PING letiZia (192.168.1.10) 56(84) bytes of data.
64 bytes from letiZia (192.168.1.10): icmp_seq=1 ttl=64 time=0.230 ms
64 bytes from letiZia (192.168.1.10): icmp_seq=2 ttl=64 time=0.667 ms
64 bytes from letiZia (192.168.1.10): icmp_seq=3 ttl=64 time=0.538 ms

--- letiZia ping statistics ---

3 packets transmitted, 3 received, 0% packet loss, time 2006ms

rtt min/avg/max/mdev = 0.230/0.478/0.667/0.184 ms

[root@chipi vagrant]# ping -c3 gasper

PING gasper (192.168.4.30) 56(84) bytes of data.

64 bytes from gasper (192.168.4.30): icmp_seq=1 ttl=64 time=0.297 ms

64 bytes from gasper (192.168.4.30): icmp_seq=2 ttl=64 time=0.611 ms

64 bytes from gasper (192.168.4.30): icmp_seq=3 ttl=64 time=0.634 ms

--- gasper ping statistics ---

3 packets transmitted, 3 received, 0% packet loss, time 2004ms

rtt min/avg/max/mdev = 0.297/0.514/0.634/0.153 ms



[root@gasper vagrant]# ping -c3 gasper

PING gasper (127.0.0.1) 56(84) bytes of data.

64 bytes from gasper (127.0.0.1): icmp_seq=1 ttl=64 time=0.011 ms

64 bytes from gasper (127.0.0.1): icmp_seq=2 ttl=64 time=0.045 ms

64 bytes from gasper (127.0.0.1): icmp_seq=3 ttl=64 time=0.064 ms

--- gasper ping statistics ---

3 packets transmitted, 3 received, 0% packet loss, time 1998ms

rtt min/avg/max/mdev = 0.011/0.040/0.064/0.021 ms

[root@gasper vagrant]# ping -c3 chipi

PING chipi (192.168.4.20) 56(84) bytes of data.

64 bytes from chipi (192.168.4.20): icmp_seq=1 ttl=64 time=0.272 ms

64 bytes from chipi (192.168.4.20): icmp_seq=2 ttl=64 time=0.707 ms

64 bytes from chipi (192.168.4.20): icmp_seq=3 ttl=64 time=0.674 ms

--- chipi ping statistics ---

3 packets transmitted, 3 received, 0% packet loss, time 2002ms

rtt min/avg/max/mdev = 0.272/0.551/0.707/0.197 ms

[root@gasper vagrant]# ping -c3 letiZia

PING letiZia (192.168.1.10) 56(84) bytes of data.

^C

--- letiZia ping statistics ---

3 packets transmitted, 0 received, 100% packet loss, time 2003ms

↓ ↓ +++ PLANTEAMIENTO CON: IpTables +++



==> En todos, ...

yum install iptables-services iptables-utils -y

systemctl status iptables.service

systemctl start iptables.service

systemctl status iptables.service

iptables -F

iptables -L -v

Chain INPUT (policy ACCEPT 9 packets, 504 bytes)

pkts	bytes	target	prot	opt	in	out	source	destination
------	-------	--------	------	-----	----	-----	--------	-------------

Chain FORWARD (policy ACCEPT 0 packets, 0 bytes)

pkts	bytes	target	prot	opt	in	out	source	destination
------	-------	--------	------	-----	----	-----	--------	-------------

Chain OUTPUT (policy ACCEPT 5 packets, 380 bytes)

pkts	bytes	target	prot	opt	in	out	source	destination
------	-------	--------	------	-----	----	-----	--------	-------------



==> Permitimos SSH → 22.
==> Permitimos ICMP → ping.
==> DROP-eamos TODO.

[root@letiZia vagrant]# iptables -A INPUT -p tcp --dport 22 -j ACCEPT

[root@letiZia vagrant]# iptables -A INPUT -p icmp -j ACCEPT

[root@letiZia vagrant]# iptables -A OUTPUT -p icmp -j ACCEPT

[root@letiZia vagrant]# iptables -P INPUT DROP

[root@letiZia vagrant]# iptables -L --line-number -n

Chain INPUT (policy DROP)

num	target	prot	opt	source	destination	
1	ACCEPT	tcp	--	0.0.0.0/0	0.0.0.0/0	tcp dpt:22
2	ACCEPT	icmp	--	0.0.0.0/0	0.0.0.0/0	

Chain FORWARD (policy ACCEPT)

num	target	prot	opt	source	destination
-----	--------	------	-----	--------	-------------

Chain OUTPUT (policy ACCEPT)

num	target	prot	opt	source	destination
1	ACCEPT	icmp	--	0.0.0.0/0	0.0.0.0/0

[root@letiZia vagrant]# iptables -S

-P INPUT DROP

-P FORWARD ACCEPT

-P OUTPUT ACCEPT

-A INPUT -p tcp -m tcp --dport 22 -j ACCEPT

-A INPUT -p icmp -j ACCEPT

-A OUTPUT -p icmp -j ACCEPT

↳ Probamos conexiones:

[root@letiZia vagrant]# ping -c3 chipi

PING chipi (192.168.1.20) 56(84) bytes of data.
64 bytes from chipi (192.168.1.20): icmp_seq=1 ttl=64 time=0.273 ms
64 bytes from chipi (192.168.1.20): icmp_seq=2 ttl=64 time=0.599 ms
64 bytes from chipi (192.168.1.20): icmp_seq=3 ttl=64 time=0.668 ms

--- chipi ping statistics ---

3 packets transmitted, 3 received, 0% packet loss, time 2002ms
rtt min/avg/max/mdev = 0.273/0.513/0.668/0.173 ms

[root@chipi vagrant]# ping -c3 letiZia

PING letiZia (192.168.1.10) 56(84) bytes of data.
64 bytes from letiZia (192.168.1.10): icmp_seq=1 ttl=64 time=0.294 ms
64 bytes from letiZia (192.168.1.10): icmp_seq=2 ttl=64 time=0.633 ms
64 bytes from letiZia (192.168.1.10): icmp_seq=3 ttl=64 time=0.648 ms

--- letiZia ping statistics ---

3 packets transmitted, 3 received, 0% packet loss, time 2017ms
rtt min/avg/max/mdev = 0.294/0.525/0.648/0.163 ms

[root@letiZia vagrant]# vi /etc/ssh/sshd_config

PermitRootLogin yes
PasswordAuthentication yes

[root@letiZia vagrant]# systemctl restart sshd.service

[root@chipi vagrant]# ssh root@letiZia

root@letizia's password:

Last login: Tue Oct 17 03:55:46 2017

[root@letiZia vagrant]# iptables-save > iptables-letiZia



==> Activamos Forwarding.

[root@chipi vagrant]# iptables -F

[root@chipi vagrant]# iptables -A PREROUTING -t nat -i eth1 -p tcp --dport 2244 -j DNAT --to 192.168.4.30:22

[root@chipi vagrant]# iptables -L -v -t nat

```
Chain PREROUTING (policy ACCEPT 0 packets, 0 bytes)
pkts bytes target  prot opt in   out   source        destination
      0    0 DNAT   tcp  --  eth1  any    anywhere     anywhere      tcp
dpt:nmsserver to:192.168.4.30:22
```

```
Chain INPUT (policy ACCEPT 0 packets, 0 bytes)
pkts bytes target  prot opt in   out   source        destination
```

```
Chain OUTPUT (policy ACCEPT 1 packets, 76 bytes)
pkts bytes target  prot opt in   out   source        destination
```

```
Chain POSTROUTING (policy ACCEPT 1 packets, 76 bytes)
pkts bytes target  prot opt in   out   source        destination
```

```
[root@chipi vagrant]# sysctl -w net.ipv4.ip_forward=1
```

```
net.ipv4.ip_forward = 1
```

```
[root@chipi vagrant]# sysctl -a |grep ipv4.ip_forward
```

```
...
```

```
net.ipv4.ip_forward = 1
```

```
net.ipv4.ip_forward_use_pmtu = 0
```

```
...
```



```
[root@gasper vagrant]# vi /etc/ssh/sshd_config
```

```
PermitRootLogin yes
```

```
PasswordAuthentication yes
```

```
[root@gasper vagrant]# systemctl restart sshd.service
```

↳ Añadimos Ruta: → 'LetiZia' desde 'chipi':

```
[root@gasper vagrant]# ip route
```

```
default via 10.0.2.2 dev eth0 proto static metric 100
```

```
10.0.2.0/24 dev eth0 proto kernel scope link src 10.0.2.15 metric 100
```

```
192.168.4.0/24 dev eth1 proto kernel scope link src 192.168.4.30 metric 100
```

```
[root@gasper vagrant]# ip route add 192.168.1.0/24 via 192.168.4.20
```

[root@gasper vagrant]# ip route

```
default via 10.0.2.2 dev eth0 proto static metric 100
10.0.2.0/24 dev eth0 proto kernel scope link src 10.0.2.15 metric 100
192.168.1.0/24 via 192.168.4.20 dev eth1
192.168.4.0/24 dev eth1 proto kernel scope link src 192.168.4.30 metric 100
```

[root@gasper vagrant]# ip route show table local

```
broadcast 10.0.2.0 dev eth0 proto kernel scope link src 10.0.2.15
local 10.0.2.15 dev eth0 proto kernel scope host src 10.0.2.15
broadcast 10.0.2.255 dev eth0 proto kernel scope link src 10.0.2.15
broadcast 127.0.0.0 dev lo proto kernel scope link src 127.0.0.1
local 127.0.0.0/8 dev lo proto kernel scope host src 127.0.0.1
local 127.0.0.1 dev lo proto kernel scope host src 127.0.0.1
broadcast 127.255.255.255 dev lo proto kernel scope link src 127.0.0.1
broadcast 192.168.4.0 dev eth1 proto kernel scope link src 192.168.4.30
local 192.168.4.30 dev eth1 proto kernel scope host src 192.168.4.30
broadcast 192.168.4.255 dev eth1 proto kernel scope link src 192.168.4.30
```

[root@gasper vagrant]# yum install tcpdump



==> Probamos conexión.

↳ Añadimos Nueva Regla de Firewall y cargamos módulo 'conntrack':

```
[root@letiZia vagrant]# iptables -A INPUT -m conntrack --ctstate
ESTABLISHED,RELATED -j ACCEPT
[root@letiZia vagrant]# modprobe nf_conntrack
```

[root@letiZia vagrant]# ssh -p 2244 192.168.1.20

The authenticity of host '[192.168.1.20]:2244 ([192.168.1.20]:2244)' can't be established.

ECDSA key fingerprint is

SHA256:F44G5truAIYAn1/aQekLrCsELnWXvDIxUjUlHTxuIME.

ECDSA key fingerprint is MD5:e9:67:b6:8a:5c:3a:97:58:f3:83:37:09:99:15:ef:50.

Are you sure you want to continue connecting (yes/no)? yes

Warning: Permanently added '[192.168.1.20]:2244' (ECDSA) to the list of known hosts.

root@192.168.1.20's password:

Last login: Tue Oct 17 05:11:30 2017

[root@gasper ~]#

↓ Monitorizamos 'gasper':



[root@gasper vagrant]# tcpdump -i eth1

```
Actividades Terminal mar oct 17, 08:34:30 •
Archivo Editar Ver Buscar Terminal Ayuda
[root@letiZia vagrant]# ssh -p 2244 192.168.1.20
root@192.168.1.20's password:
Last login: Tue Oct 17 06:30:34 2017 from 192.168.1.10
[root@gasper ~]#
```

```
vagrant@gasper:/home/vagrant
Archivo Editar Ver Buscar Terminal Ayuda
options [nop,nop,TS val 9321102 ecr 9332159], length 0
06:34:05.158511 IP gasper.ssh > letiZia.57120: Flags [P.], seq 1822:2322, ack 19
46, win 545, options [nop,nop,TS val 9251217 ecr 9332159], length 500
06:34:05.199130 IP letiZia.57120 > gasper.ssh: Flags [.], ack 2322, win 582, opt
ions [nop,nop,TS val 9332365 ecr 9251217], length 0
06:34:05.199162 IP gasper.ssh > letiZia.57120: Flags [P.], seq 2322:2366, ack 19
46, win 545, options [nop,nop,TS val 9251261 ecr 9332365], length 44
06:34:05.199775 IP letiZia.57120 > gasper.ssh: Flags [.], ack 2366, win 582, opt
ions [nop,nop,TS val 9332365 ecr 9251261], length 0
06:34:05.200074 IP letiZia.57120 > gasper.ssh: Flags [P.], seq 1946:2474, ack 23
66, win 582, options [nop,nop,TS val 9332366 ecr 9251261], length 528
06:34:05.200084 IP gasper.ssh > letiZia.57120: Flags [.], ack 2474, win 590, opt
ions [nop,nop,TS val 9251262 ecr 9332366], length 0
06:34:05.205341 IP gasper.ssh > letiZia.57120: Flags [P.], seq 2366:2474, ack 24
74, win 590, options [nop,nop,TS val 9251264 ecr 9332366], length 108
06:34:05.212904 IP gasper.ssh > letiZia.57120: Flags [P.], seq 2474:2566, ack 24
74, win 590, options [nop,nop,TS val 9251272 ecr 9332366], length 92
06:34:05.213662 IP letiZia.57120 > gasper.ssh: Flags [.], ack 2566, win 582, opt
ions [nop,nop,TS val 9332379 ecr 9251264], length 0
06:34:05.240483 IP gasper.ssh > letiZia.57120: Flags [P.], seq 2566:2650, ack 24
74, win 590, options [nop,nop,TS val 9251302 ecr 9332379], length 84
06:34:05.281177 IP letiZia.57120 > gasper.ssh: Flags [.], ack 2650, win 582, opt
ions [nop,nop,TS val 9332447 ecr 9251302], length 0
```

↓ Por último Respaldamos configuración de iptables:

[root@letiZia vagrant]# iptables-save > iptables-letiZia

...

↓ Y en su caso aplicamos en:

[root@letiZia vagrant]# cat iptables-letiZia > /etc/sysconfig/iptables

[root@letiZia vagrant]# vi /etc/sysconfig/iptables

Generated by iptables-save v1.4.21 on Tue Oct 17 06:45:19 2017

*nat

:PREROUTING ACCEPT [0:0]

:INPUT ACCEPT [0:0]

:OUTPUT ACCEPT [10:680]

:POSTROUTING ACCEPT [10:680]

COMMIT

Completed on Tue Oct 17 06:45:19 2017

```
# Generated by iptables-save v1.4.21 on Tue Oct 17 06:45:19 2017
*filter
:INPUT DROP [0:0]
:FORWARD ACCEPT [0:0]
:OUTPUT ACCEPT [196:20691]
-A INPUT -p tcp -m tcp --dport 22 -j ACCEPT
-A INPUT -p icmp -j ACCEPT
-A INPUT -j LOG
-A INPUT -m conntrack --ctstate RELATED,ESTABLISHED -j ACCEPT
-A OUTPUT -p icmp -j ACCEPT
COMMIT
# Completed on Tue Oct 17 06:45:19 2017
```

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