



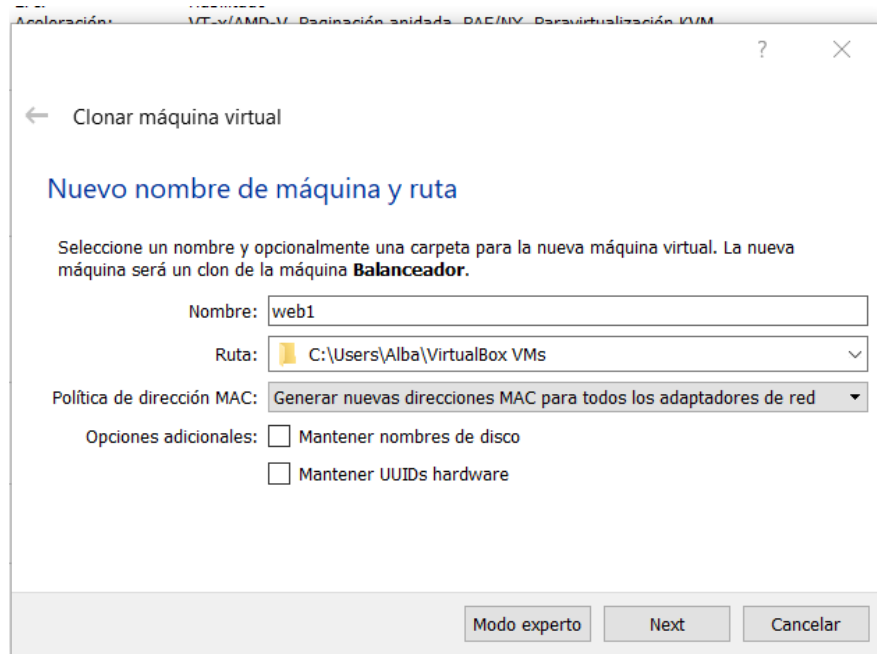
PRÁCTICA 9

Administración de sistemas y redes

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A partir de una maquina virtual base con CentOS la clonamos en otras dos creando así a partir de Balanceador, web1 y web 2.

Para ello nos aseguramos de seleccionar nuevas direcciones MAC durante la creación



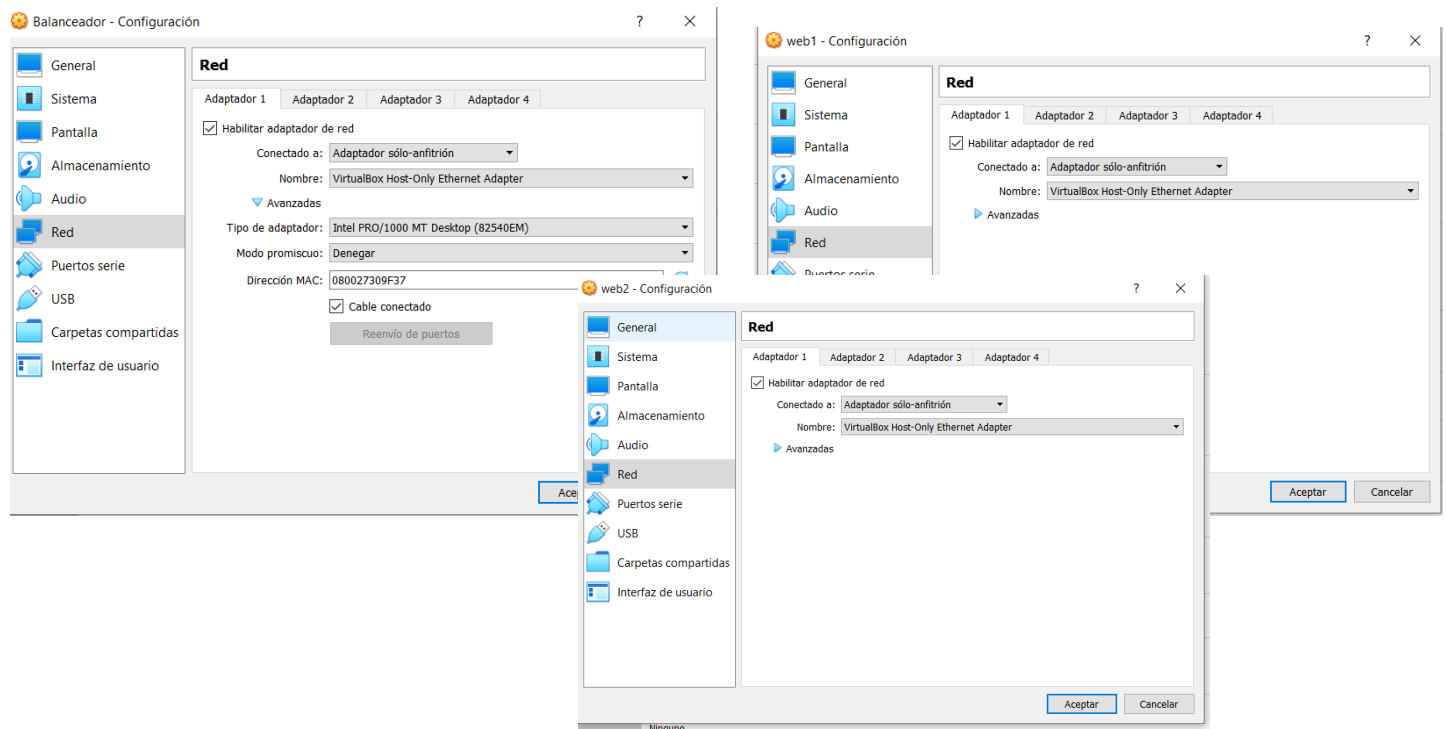
Procedemos a instalar httpd en las máquinas web1 y web 2

```
[U0266007@localhost ~]$ dnf install httpd
Última comprobación de caducidad de metadatos hecha hace 0:00:00, el dom 25 abr 2021 11:45:11 CEST.
Dependencias resueltas.
=====
Paquete                Arquitectura  Versión                Repositorio
=====
Instalando:
httpd                  x86_64       2.4.37-30.module_el8.3.0+561+97fdbbcc  AppStream
Instalando dependencias:
apr                    x86_64       1.6.3-11.el8           AppStream
apr-util               x86_64       1.6.1-6.el8            AppStream
centos-logos-httpd     noarch       80.5-2.el8             BaseOS
httpdfilesystem        noarch       2.4.37-30.module_el8.3.0+561+97fdbbcc  AppStream
```

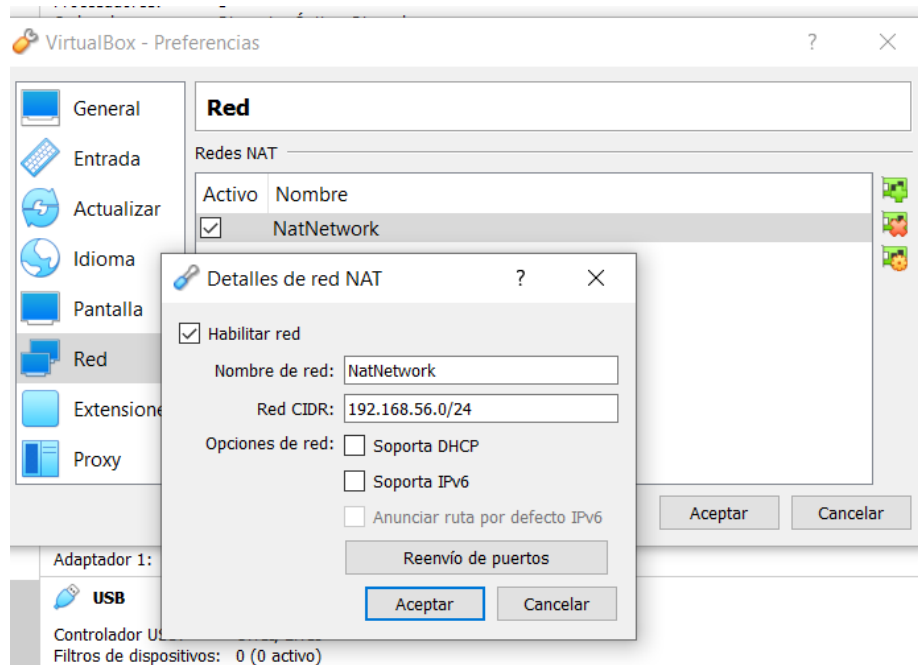
Procedemos a instalar haproxy en la máquina balanceador

```
[U0266007@localhost ~]$ dnf install haproxy
Última comprobación de caducidad de metadatos hecha hace 0:20:55, el dom 25 abr 2021 11:27:10 CEST.
Dependencias resueltas.
=====
Paquete                Arquitectura  Versión                Repositorio
=====
Instalando:
haproxy                x86_64       1.8.23-5.el8           AppStream
Resumen de la transacción
=====
Instalar 1 Paquete
```

Establecemos en el adaptador de red como solo anfitrión en todas las máquinas



Vamos a archivo >preferencias >red y deshabilitamos el DHCP para cualquier red que este en el bloque de direcciones 192.168.56.0/24



Arrancamos todas las máquinas y ejecutamos #ipd addr para comprbar que en todas aparece la red enp0s3

Web2

```

[U0266007@localhost~]$ ip addr
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
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 08:00:27:2a:50:89 brd ff:ff:ff:ff:ff:ff
    inet 192.168.56.104/24 brd 192.168.56.255 scope global dynamic noprefixroute enp0s3
        valid_lft 517sec preferred_lft 517sec
    inet6 fe80::764b:87e:57b2:bd91/64 scope link dadfailed tentative noprefixroute
        valid_lft forever preferred_lft forever
    inet6 fe80::1f8a:a36d:6767:4306/64 scope link dadfailed tentative noprefixroute
        valid_lft forever preferred_lft forever
    inet6 fe80::8c78:280f:a793:1e0a/64 scope link noprefixroute
        valid_lft forever preferred_lft forever
[U0266007@localhost~]$

```

Web1

```

[U0266007@localhost~]$ ip addr
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
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 08:00:27:ba:f7:23 brd ff:ff:ff:ff:ff:ff
    inet 192.168.56.102/24 brd 192.168.56.255 scope global dynamic noprefixroute enp0s3
        valid_lft 440sec preferred_lft 440sec
    inet6 fe80::1f8a:a36d:6767:4306/64 scope link noprefixroute
        valid_lft forever preferred_lft forever
[U0266007@localhost~]$

```

Balancedor

```

[U0266007@localhost~]$ ip addr
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
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 08:00:27:30:9f:37 brd ff:ff:ff:ff:ff:ff
    inet 192.168.56.103/24 brd 192.168.56.255 scope global dynamic noprefixroute enp0s3
        valid_lft 383sec preferred_lft 383sec
    inet6 fe80::1f8a:a36d:6767:4306/64 scope link dadfailed tentative noprefixroute
        valid_lft forever preferred_lft forever
    inet6 fe80::764b:87e:57b2:bd91/64 scope link noprefixroute
        valid_lft forever preferred_lft forever
[U0266007@localhost~]$ _

```

Procedemos a asignar una ip estática a cada una de las maquinas

En balanceador asignaremos la ip

```

TYPE="Ethernet"
PROXY_METHOD="none"
BROWSER_ONLY="no"
BOOTPROTO="dhcp"
DEFROUTE="yes"
IPV4_FAILURE_FATAL="no"
IPV6INIT="yes"
IPV6_AUTOCONF="yes"
IPV6_DEFROUTE="yes"
IPV6_FAILURE_FATAL="no"
IPV6_ADDR_GEN_MODE="stable-privacy"
NAME="enp0s3"
UUID="f3b5e408-3b63-4754-8e69-652aa8a0e3c6"
DEVICE="enp0s3"
ONBOOT="yes"

```

Captura previa a la modificación

```

TYPE="Ethernet"
PROXY_METHOD="none"
BROWSER_ONLY="no"
BOOTPROTO="none"
DEFROUTE="yes"
IPV4_FAILURE_FATAL="no"
IPV6INIT="yes"
IPV6_AUTOCONF="yes"
IPV6_DEFROUTE="yes"
IPV6_FAILURE_FATAL="no"
IPV6_ADDR_GEN_MODE="stable-privacy"
NAME="enp0s3"
UUID="f3b5e408-3b63-4754-8e69-652aa8a0e3c6"
DEVICE="enp0s3"
ONBOOT="yes"
IPADDR="192.168.56.20"
NETMASK="255.255.255.0"

```

Balanceador

Web2

```

TYPE="Ethernet"
PROXY_METHOD="none"
BROWSER_ONLY="no"
BOOTPROTO="none"
DEFROUTE="yes"
IPV4_FAILURE_FATAL="no"
IPV6INIT="yes"
IPV6_AUTOCONF="yes"
IPV6_DEFROUTE="yes"
IPV6_FAILURE_FATAL="no"
IPV6_ADDR_GEN_MODE="stable-privacy"
NAME="enp0s3"
UUID="f3b5e408-3b63-4754-8e69-652aa8a0e3c6"
DEVICE="enp0s3"
ONBOOT="yes"
IPADDR="192.168.56.21"
NETMASK="255.255.255.0"

```

Web1

```

TYPE="Ethernet"
PROXY_METHOD="none"
BROWSER_ONLY="no"
BOOTPROTO="none"
DEFROUTE="yes"
IPV4_FAILURE_FATAL="no"
IPV6INIT="yes"
IPV6_AUTOCONF="yes"
IPV6_DEFROUTE="yes"
IPV6_FAILURE_FATAL="no"
IPV6_ADDR_GEN_MODE="stable-privacy"
NAME="enp0s3"
UUID="f3b5e408-3b63-4754-8e69-652aa8a0e3c6"
DEVICE="enp0s3"
ONBOOT="yes"
IPADDR="192.168.56.22"
NETMASK="255.255.255.0"

```

Reiniciamos las máquinas y procedemos a comprobar mediante la orden `#ip addr` que se ha asignado correctamente la ip y que las maquinas están conectadas entre si, para ello realizaremos un ping

Comprobamos el ping de la web1

```

U0266007@localhost~$ ip addr
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
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 08:00:27:ba:f7:23 brd ff:ff:ff:ff:ff:ff
    inet 192.168.56.22/24 brd 192.168.56.255 scope global noprefixroute enp0s3
        valid_lft forever preferred_lft forever
    inet6 fe80::1f8a:a36d:6767:4306/64 scope link noprefixroute
        valid_lft forever preferred_lft forever
U0266007@localhost~$ ping 192.168.56.20
PING 192.168.56.20 (192.168.56.20) 56(84) bytes of data.
64 bytes from 192.168.56.20: icmp_seq=1 ttl=64 time=1.30 ms
64 bytes from 192.168.56.20: icmp_seq=2 ttl=64 time=0.547 ms
64 bytes from 192.168.56.20: icmp_seq=3 ttl=64 time=5.10 ms
64 bytes from 192.168.56.20: icmp_seq=4 ttl=64 time=0.755 ms
^C
--- 192.168.56.20 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 43ms
rtt min/avg/max/mdev = 0.547/1.926/5.101/1.854 ms
U0266007@localhost~$ ping 192.168.56.21
PING 192.168.56.21 (192.168.56.21) 56(84) bytes of data.
64 bytes from 192.168.56.21: icmp_seq=1 ttl=64 time=1.45 ms
64 bytes from 192.168.56.21: icmp_seq=2 ttl=64 time=1.41 ms
64 bytes from 192.168.56.21: icmp_seq=3 ttl=64 time=1.06 ms
64 bytes from 192.168.56.21: icmp_seq=4 ttl=64 time=1.29 ms
^C
--- 192.168.56.21 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 8ms
rtt min/avg/max/mdev = 1.060/1.299/1.445/0.154 ms
U0266007@localhost~$

```

Comprobamos desde el balanceador

```

U0266007@localhost~$ ip addr
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
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 08:00:27:30:9f:37 brd ff:ff:ff:ff:ff:ff
    inet 192.168.56.20/24 brd 192.168.56.255 scope global noprefixroute enp0s3
        valid_lft forever preferred_lft forever
    inet6 fe80::1f8a:a36d:6767:4306/64 scope link dadfailed tentative noprefixroute
        valid_lft forever preferred_lft forever
    inet6 fe80::764b:87e:57b2:bd91/64 scope link noprefixroute
        valid_lft forever preferred_lft forever
U0266007@localhost~$ ping 192.168.56.21
PING 192.168.56.21 (192.168.56.21) 56(84) bytes of data.
64 bytes from 192.168.56.21: icmp_seq=1 ttl=64 time=2.48 ms
64 bytes from 192.168.56.21: icmp_seq=2 ttl=64 time=1.50 ms
64 bytes from 192.168.56.21: icmp_seq=3 ttl=64 time=1.31 ms
64 bytes from 192.168.56.21: icmp_seq=4 ttl=64 time=0.635 ms
^C
--- 192.168.56.21 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 101ms
rtt min/avg/max/mdev = 0.635/1.482/2.483/0.662 ms
U0266007@localhost~$ ping 192.168.56.22
PING 192.168.56.22 (192.168.56.22) 56(84) bytes of data.
64 bytes from 192.168.56.22: icmp_seq=1 ttl=64 time=1.24 ms
64 bytes from 192.168.56.22: icmp_seq=2 ttl=64 time=1.26 ms
64 bytes from 192.168.56.22: icmp_seq=3 ttl=64 time=0.705 ms
64 bytes from 192.168.56.22: icmp_seq=4 ttl=64 time=1.23 ms
^C
--- 192.168.56.22 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 60ms
rtt min/avg/max/mdev = 0.705/1.109/1.250/0.236 ms
U0266007@localhost~$ _

```

Ping desde web2

```

[U0266007@localhost]~$ ip addr
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
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 08:00:27:2a:50:89 brd ff:ff:ff:ff:ff:ff
    inet 192.168.56.21/24 brd 192.168.56.255 scope global noprefixroute enp0s3
        valid_lft forever preferred_lft forever
    inet6 fe80::764b:87e:57b2:bd91/64 scope link dadfailed tentative noprefixroute
        valid_lft forever preferred_lft forever
    inet6 fe80::1f8a:a36d:6767:4306/64 scope link dadfailed tentative noprefixroute
        valid_lft forever preferred_lft forever
    inet6 fe80::8c78:280f:a793:1e0a/64 scope link noprefixroute
        valid_lft forever preferred_lft forever
[U0266007@localhost]~$ ping 192.168.56.20
PING 192.168.56.20 (192.168.56.20) 56(84) bytes of data.
64 bytes from 192.168.56.20: icmp_seq=1 ttl=64 time=1.11 ms
64 bytes from 192.168.56.20: icmp_seq=2 ttl=64 time=0.670 ms
64 bytes from 192.168.56.20: icmp_seq=3 ttl=64 time=1.03 ms
64 bytes from 192.168.56.20: icmp_seq=4 ttl=64 time=1.26 ms
^C
--- 192.168.56.20 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 51ms
rtt min/avg/max/mdev = 0.670/1.017/1.262/0.218 ms
[U0266007@localhost]~$ ping 192.168.56.22
PING 192.168.56.22 (192.168.56.22) 56(84) bytes of data.
64 bytes from 192.168.56.22: icmp_seq=1 ttl=64 time=1.19 ms
64 bytes from 192.168.56.22: icmp_seq=2 ttl=64 time=0.610 ms
64 bytes from 192.168.56.22: icmp_seq=3 ttl=64 time=0.438 ms
64 bytes from 192.168.56.22: icmp_seq=4 ttl=64 time=1.22 ms
^C
--- 192.168.56.22 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 37ms
rtt min/avg/max/mdev = 0.438/0.864/1.218/0.348 ms
[U0266007@localhost]~$ _

```

En web 1 y web 2 procedemos a movernos a `var/www/html` y crear un archivo html llamado `index`

```

[U0266007@localhost[home]$ cd /var/www/html/
[U0266007@localhost[html]$ ls
[U0266007@localhost[html]$ nano index.html

```

Creamos el archivo html en web 1

```

<html>
<head>
    <title> Servidor web 1 </title>
</head>
<body>
<h1> Servidor web 1</h1>
</body>
</html>

```

Creamos el archivo html en web 2

```

<html>
<head>
    <title> Servidor web 2 </title>
</head>
<body>
<h1> Servidor web 2 </h1>
</body>
</html>

```

Habilitamos el cortafuegos en todas las máquinas para el servicio httpd

Web 1

```
[U0266007@localhost[html]$ firewall-cmd --add-service http
success
[U0266007@localhost[html]$ firewall-cmd --add-service http --permanent
success
```

Además, para web 1 y web 2 iniciamos y establecemos el servicio httpd

```
[U0266007@localhost[html]$ systemctl start httpd.service
[U0266007@localhost[html]$ systemctl enable httpd.service
Created symlink /etc/systemd/system/multi-user.target.wants/httpd.service + /usr/lib/systemd/system/httpd.service.
[U0266007@localhost[html]$
```

Web 2

```
[U0266007@localhost[html]$ firewall-cmd --add-service http
success
[U0266007@localhost[html]$ firewall-cmd --add-service http --permanent
success
[U0266007@localhost[html]$ firew
[U0266007@localhost[html]$ systemctl start httpd.service
[U0266007@localhost[html]$ systemctl enable httpd.service
Created symlink /etc/systemd/system/multi-user.target.wants/httpd.service + /usr/lib/systemd/system/httpd.service.
[U0266007@localhost[html]$
```

Balanceador, como habíamos comentado antes solo estableceríamos el cortafuegos

```
[U0266007@localhost[~]$ firewall-cmd --add-service http
success
[U0266007@localhost[~]$ firewall-cmd --add-service http --permanent
success
[U0266007@localhost[~]$
```

En el balanceador procedemos a cambiar el archivo `/etc/haproxy/haproxy.cfg`, para que escuche en el puerto 80 y balancee entre los dos servidores web

#nano /etc/haproxy/haproxy.cfg

```
frontend main
# bind *:5000
bind *:80
acl url_static      path_beg       -i /static /images /javascript /stylesheets
acl url_static      path_end       -i .jpg .gif .png .css .js

use_backend static   if url_static
default_backend      app

#-----
# static backend for serving up images, stylesheets and such
#-----
backend static
    balance          roundrobin
    server            static 127.0.0.1:4331 check

#-----
# round robin balancing between the various backends
#-----
backend app
    balance          roundrobin
    # server app1 127.0.0.1:5001 check
    #server app2 127.0.0.1:5002 check
    # server app3 127.0.0.1:5003 check
    # server app4 127.0.0.1:5004 check
server web1 192.168.56.21:80 check
server web2 192.168.56.22:80 check
```


Posteriormente procedemos a arrancar y establecer el servicio haproxy

```
[U0266007@localhost ~]$ systemctl start haproxy.service
[U0266007@localhost ~]$ systemctl enable haproxy.service
Created symlink /etc/systemd/system/multi-user.target.wants/haproxy.service → /usr/lib/systemd/system/haproxy.service.
[U0266007@localhost ~]$
```