MUM MikroTik User Meeting

BALANCEO DE CARGA DE USUARIOS A SERVIDORES WEB CON DST-NAT

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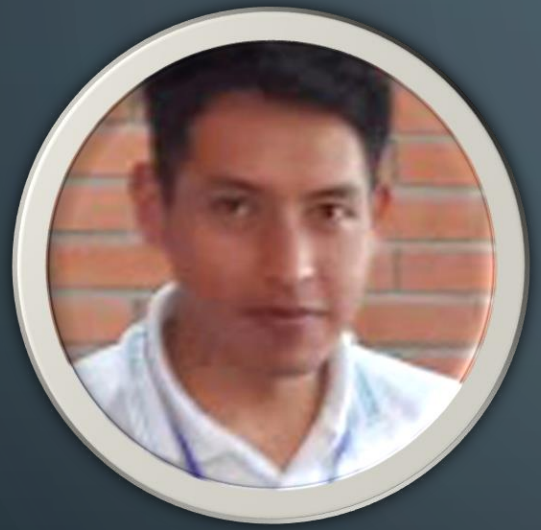
SOBRE EL PRESENTADOR



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INTRODUCCIÓN

- Las instituciones que actualmente tienen servidores, donde día a día van accediendo los usuarios, esta cantidad de usuarios va en constante crecimiento.

PROBLEMÁTICA

- Estas instituciones por la creciente cantidad de usuarios que van accediendo a sus servidores web, van teniendo dificultades con su servidor, ya que el servidor puede soportar una cantidad limitada de usuarios conectados simultáneamente.

OBJETIVOS

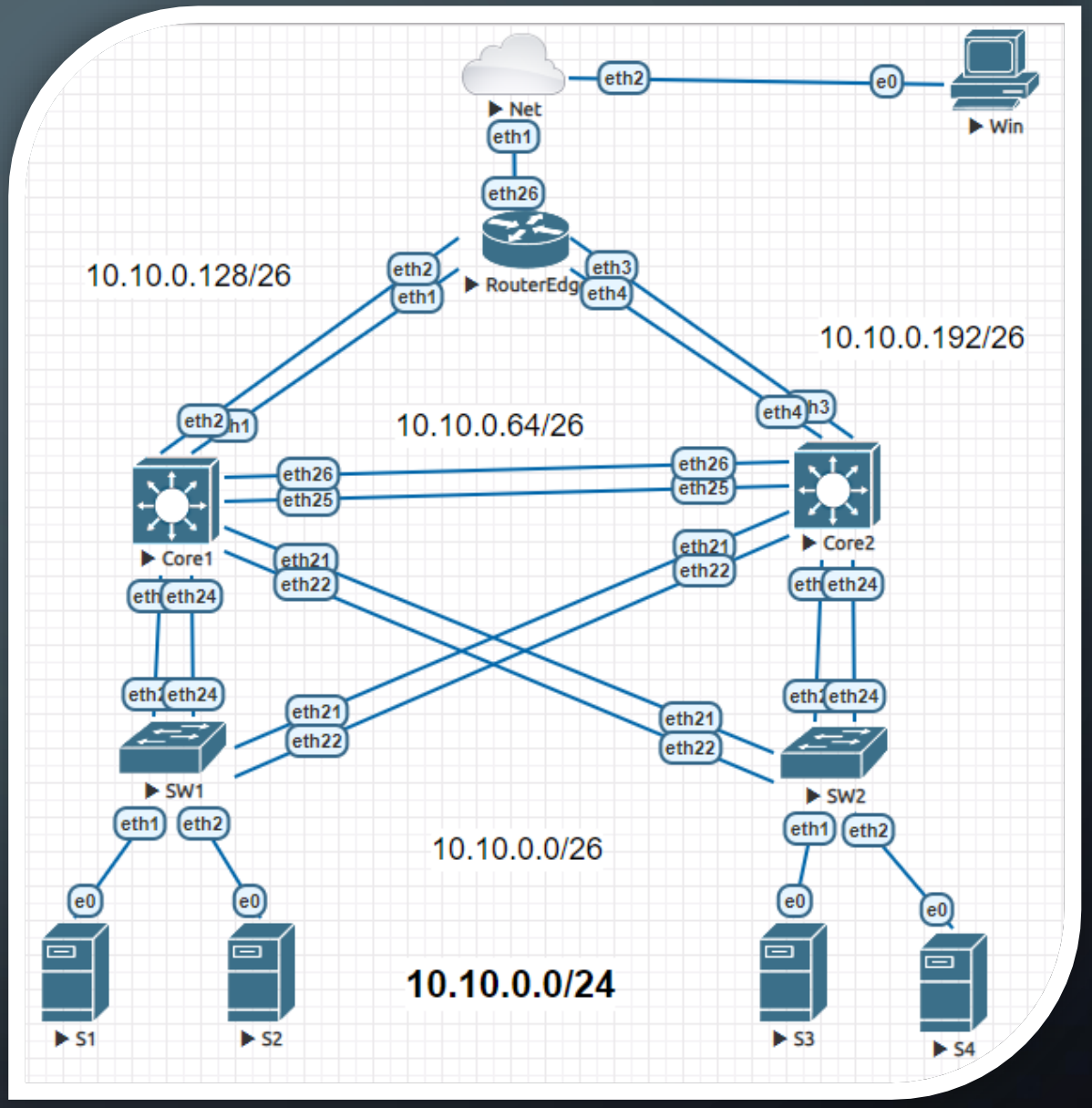
- Implementar el balanceo de solicitudes de múltiples usuarios a múltiples servidores utilizando RouterOS.

ANÁLISIS

- Se tiene una red de varios servidores web las cuales se encuentran en una DMZ, para permitir el acceso de varios usuario balanceados entre los múltiples servidores. (en este caso trabajaremos entre 4 servidores) y estos mismos servidores suelen esta conectados a una red de almacenamiento.

TOPOLOGIA DE LA RED

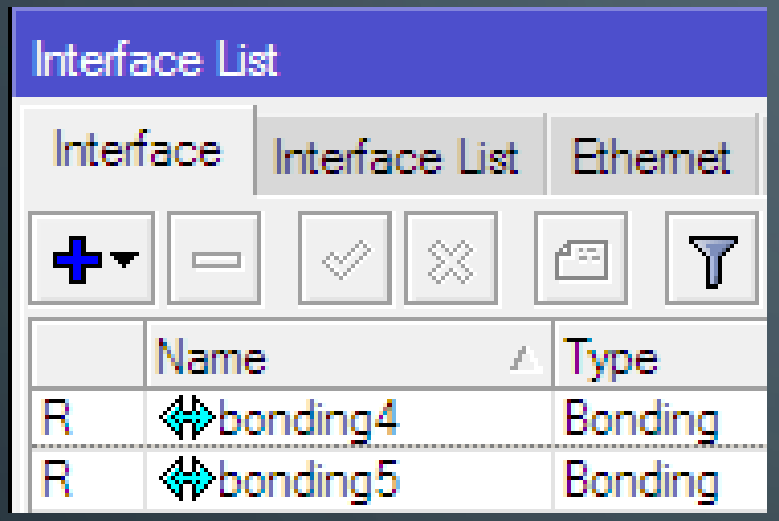
- Se tiene una pequeña red, la cual esta distribuida en 2 capas (Nucleo , Acceso). También se dispone de servidores a los cuales serán balanceados los usuarios.

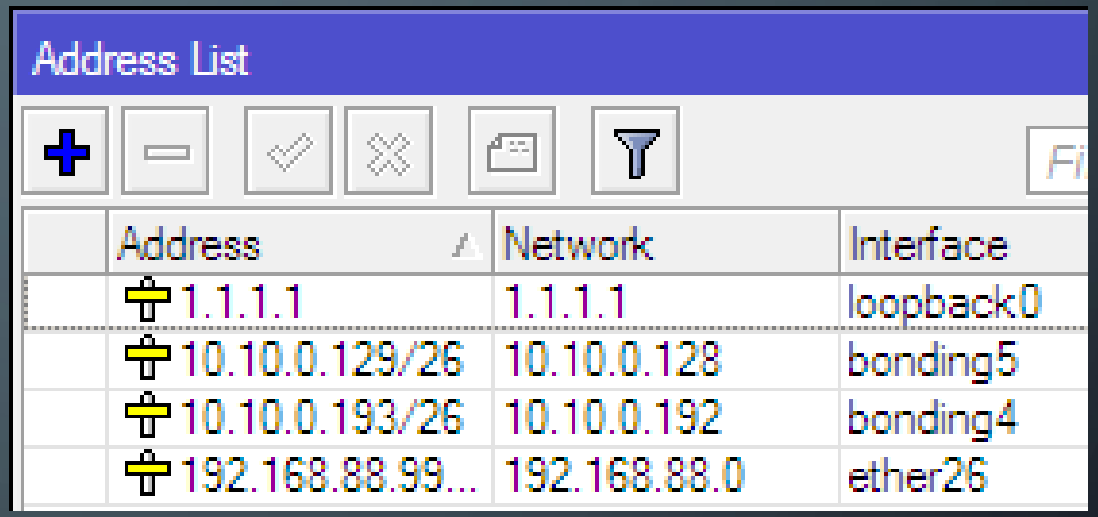


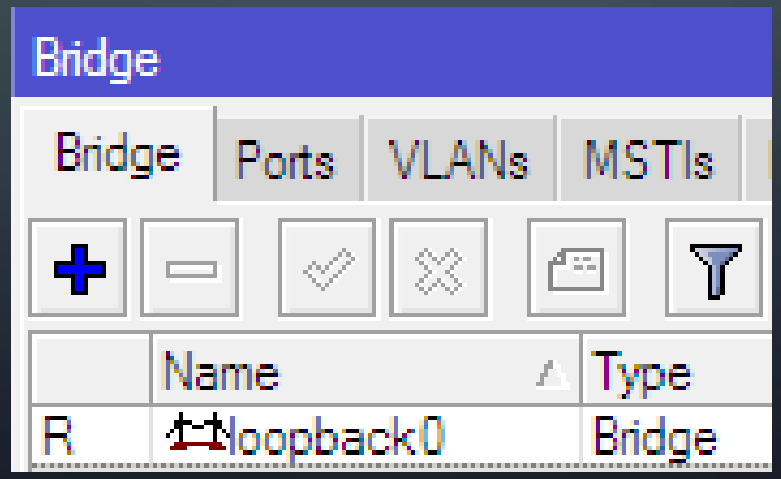
ACTIVIDADES A REALIZAR

- CONFIGURACION DE DIRECCIONES IP
- CONFIGURACION DE ROUTING
- PREPARACION Y CONFIGURACION DE SERVIDORES
- MARCADO DE PAQUETES
- BALANCEO DE SOLICITUDES WEB
- PRUEBAS

CONFIGURACIÓN DE DIRECCIONES IP – ROUTER EDGE







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CONFIGURACIÓN DE DIRECCIONES IP – ROUTER EDGE

```
/interface bridge
add name=loopback0

/interface bonding
add name=bonding4 slaves=ether3,ether4
add name=bonding5 slaves=ether1,ether2

/ip address
add address=192.168.88.99/24 interface=ether26 network=192.168.88.0
add address=10.10.0.193/26 interface=bonding4 network=10.10.0.192
add address=10.10.0.129/26 interface=bonding5 network=10.10.0.128
add address=1.1.1.1 interface=loopback0 network=1.1.1.1
```

CONFIGURACIÓN DE DIRECCIONES IP – CORE1

Interface List

Interface | Interface List | Ethernet

	Name	Type
RS	bonding1	Bonding
RS	bonding2	Bonding
R	bonding3	Bonding
R	bonding5	Bonding

Address List

	Address	Network	Interface
	10.10.0.65/26	10.10.0.64	bonding3
	10.10.0.130/26	10.10.0.128	bonding5
	10.10.0.2/26	10.10.0.0	bridge1
	2.2.2.2	2.2.2.2	loopback0

Bridge

Bridge | Ports | VLANs | MSTIs

	Name	Type
R	bridge1	Bridge
R	loopback0	Bridge

Bridge

Bridge | Ports | VLANs | MSTIs | Port M

#		Interface	Bridge
0		bonding1	bridge1
1		bonding2	bridge1

CONFIGURACIÓN DE DIRECCIONES IP – CORE1

```
/interface bonding
add name=bonding1 slaves=ether23,ether24
add name=bonding2 slaves=ether21,ether22
add name=bonding3 slaves=ether26,ether25
add name=bonding5 slaves=ether1,ether2
/interface bridge
add name=bridge1
add name=loopback0
/interface bridge port
add bridge=bridge1 interface=bonding1
add bridge=bridge1 interface=bonding2
/ip address
add address=10.10.0.130/26 interface=bonding5 network=10.10.0.128
add address=10.10.0.65/26 interface=bonding3 network=10.10.0.64
add address=2.2.2.2 interface=loopback0 network=2.2.2.2
add address=10.10.0.2/26 interface=bridge1 network=10.10.0.0
```

CONFIGURACIÓN DE DIRECCIONES IP – CORE2

Interface List

Interface | Interface List | Ethernet

	Name	Type
RS	bonding1	Bonding
RS	bonding2	Bonding
R	bonding3	Bonding
R	bonding4	Bonding

Address List

	Address	Network	Interface
	10.10.0.66/26	10.10.0.64	bonding3
	10.10.0.194/26	10.10.0.192	bonding4
	10.10.0.3/26	10.10.0.0	bridge1
	3.3.3.3	3.3.3.3	loopback0

Bridge

Bridge | Ports | VLANs | MSTIs

	Name	Type
R	bridge1	Bridge
R	loopback0	Bridge

Bridge

Bridge | Ports | VLANs | MSTIs | Port

#		Interface	Bridge
0		bonding1	bridge1
1		bonding2	bridge1

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CONFIGURACIÓN DE DIRECCIONES IP – CORE2

```
/interface bonding
add name=bonding1 slaves=ether23,ether24
add name=bonding2 slaves=ether21,ether22
add name=bonding3 slaves=ether25,ether26
add name=bonding4 slaves=ether3,ether4

/interface bridge
add name=bridge1
add name=loopback0

/interface bridge port
add bridge=bridge1 interface=bonding1
add bridge=bridge1 interface=bonding2

/ip address
add address=10.10.0.194/26 interface=bonding4 network=10.10.0.192
add address=10.10.0.66/26 interface=bonding3 network=10.10.0.64
add address=3.3.3.3 interface=loopback0 network=3.3.3.3
add address=10.10.0.3/26 interface=bridge1 network=10.10.0.0
```

CONFIGURACIÓN DE DIRECCIONES IP – SW1

Interface List

Interface | Interface List | Ethernet

	Name	Type
RS	bonding1	Bonding
RS	bonding2	Bonding
R	bridge1	Bridge
RS	ether1	Ethernet
RS	ether2	Ethernet

Bridge

Bridge | Ports | VLANs | MSTIs

	Name	Type
R	bridge1	Bridge

Bridge

Bridge | Ports | VLANs | MSTIs | Port M

#	Interface	Bridge
0	ether1	bridge1
1	ether2	bridge1
2	bonding1	bridge1
3	bonding2	bridge1
4	ether3	bridge1

Address List

	Address	Network	Interface
	10.10.0.4/26	10.10.0.0	bridge1

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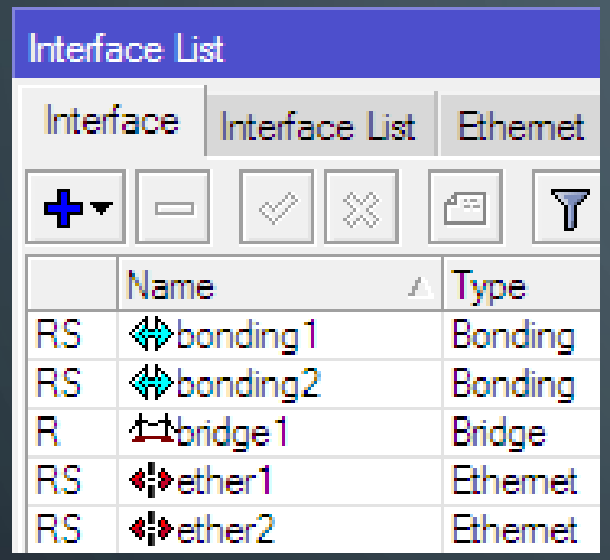
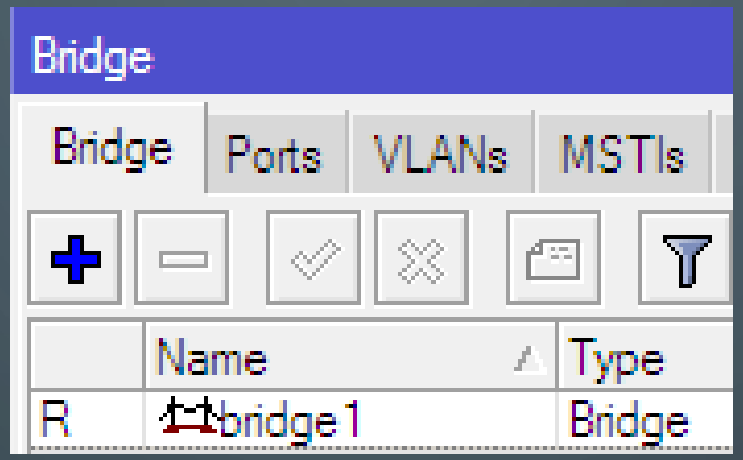
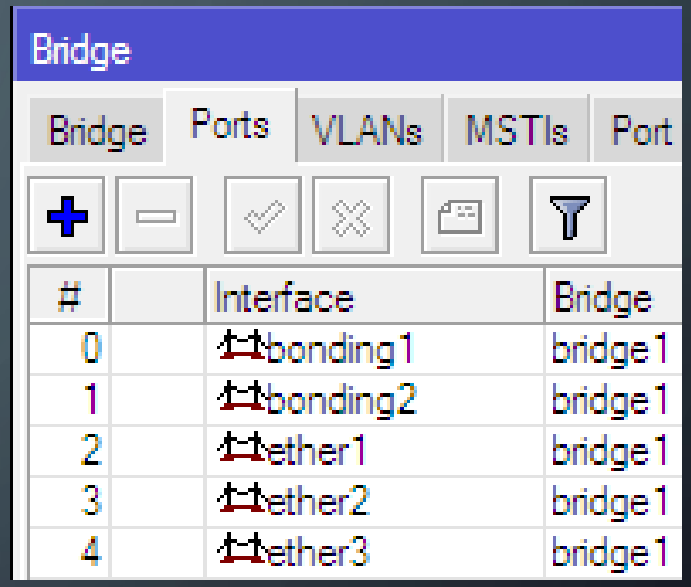
CONFIGURACIÓN DE DIRECCIONES IP – SW1

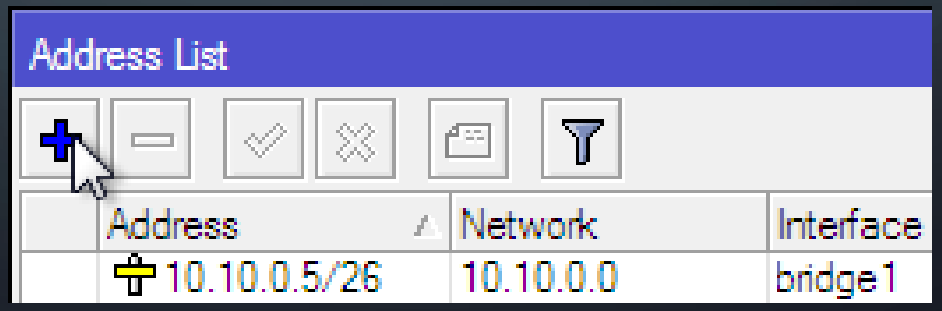
```
/interface bonding
add name=bonding1 slaves=ether23,ether24
add name=bonding2 slaves=ether21,ether22

/interface bridge
add name=bridge1

/interface bridge port
add bridge=bridge1 interface=ether1
add bridge=bridge1 interface=ether2
add bridge=bridge1 interface=bonding1
add bridge=bridge1 interface=bonding2
add bridge=bridge1 interface=ether3

/ip address
add address=10.10.0.4/26 interface=bridge1 network=10.10.0.0
```

CONFIGURACIÓN DE DIRECCIONES IP – SW2





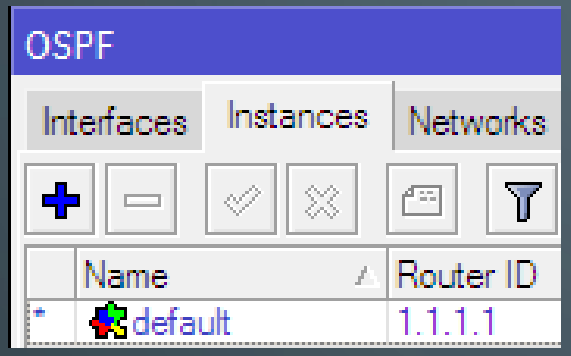


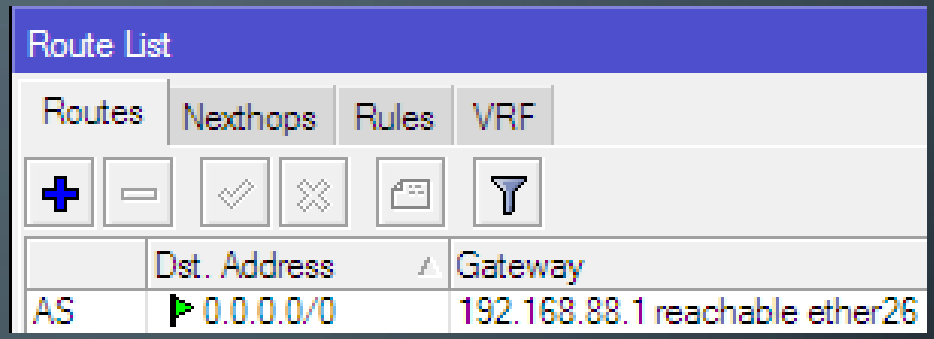


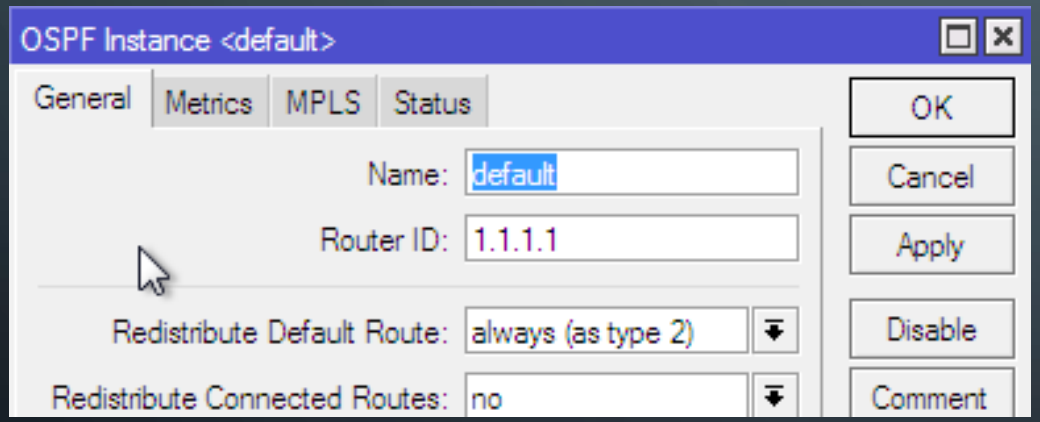
CONFIGURACIÓN DE DIRECCIONES IP – SW2

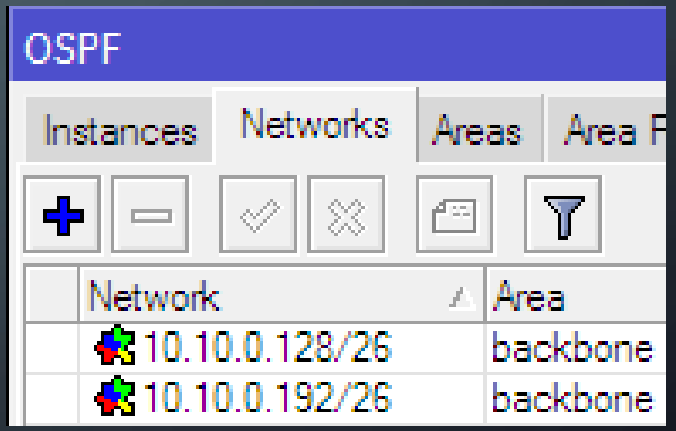
```
/interface bonding
add name=bonding1 slaves=ether23,ether24
add name=bonding2 slaves=ether21,ether22

/interface bridge
add name=bridge1

/interface bridge port
add bridge=bridge1 interface=bonding1
add bridge=bridge1 interface=bonding2
add bridge=bridge1 interface=ether1
add bridge=bridge1 interface=ether2
add bridge=bridge1 interface=ether3

/ip address
add address=10.10.0.5/26 interface=bridge1 network=10.10.0.0
```

CONFIGURACIÓN DE ROUTING - ROUTER EDGE





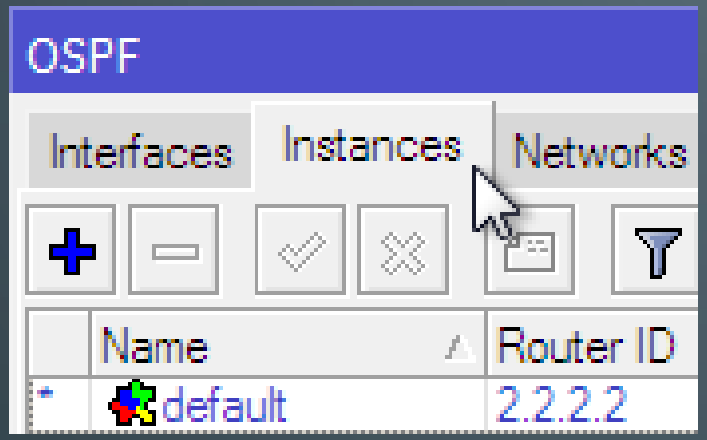


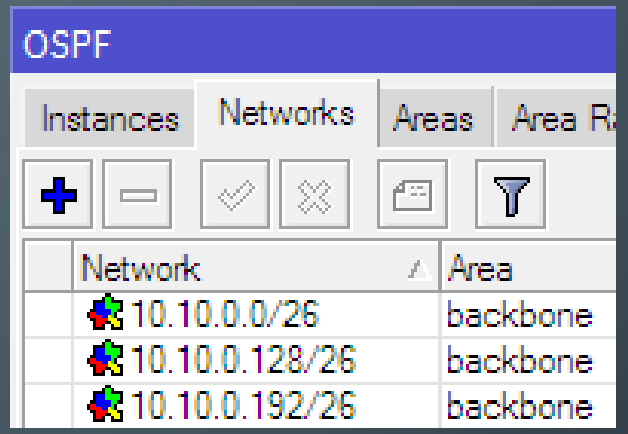


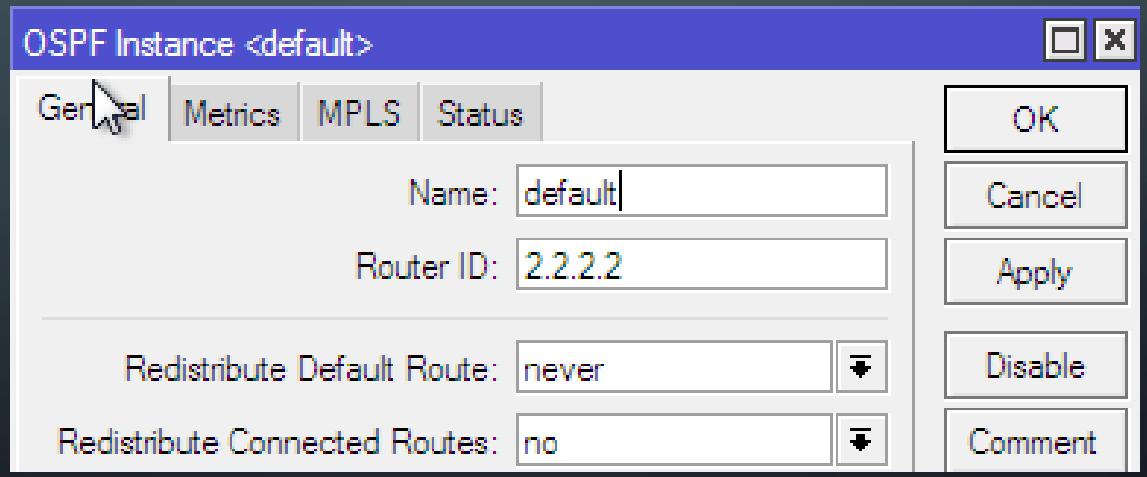
CONFIGURACIÓN DE ROUTING - ROUTER EDGE

```
/ip route
add distance=1 gateway=192.168.88.1

/routing ospf instance
set [ find default=yes ] distribute-default=always-as-type-2 router-id=1.1.1.1

/routing ospf network
add area=backbone network=10.10.0.192/26
add area=backbone network=10.10.0.128/26
```

CONFIGURACIÓN DE ROUTING –CORE1



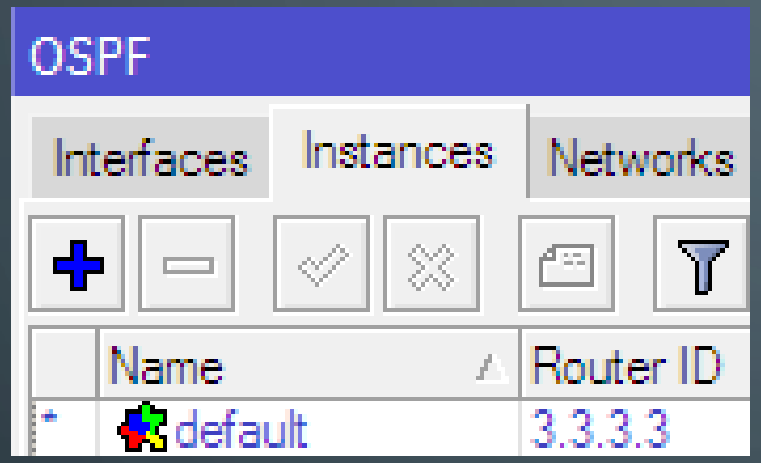


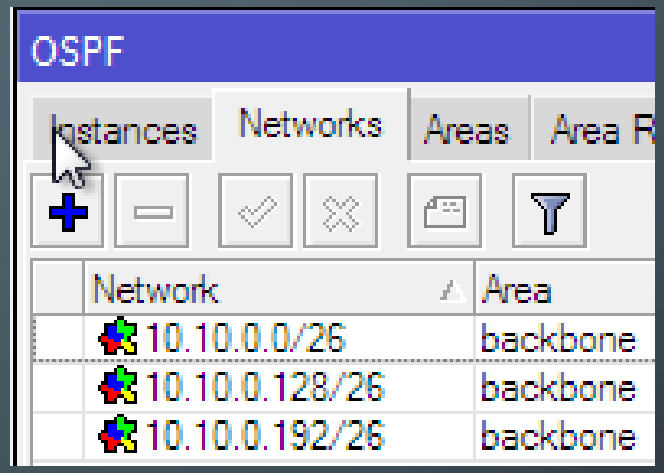


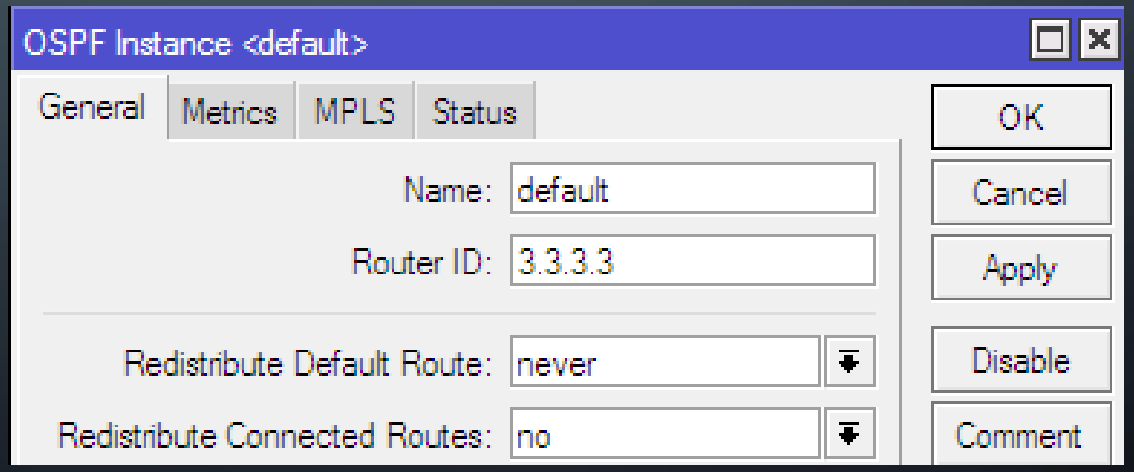
CONFIGURACIÓN DE ROUTING –CORE1

```
/routing ospf instance
set [ find default=yes ] router-id=2.2.2.2
/routing ospf network
add area=backbone network=10.10.0.128/26
add area=backbone network=10.10.0.192/26
add area=backbone network=10.10.0.0/26
```

CONFIGURACIÓN DE ROUTING –CORE2



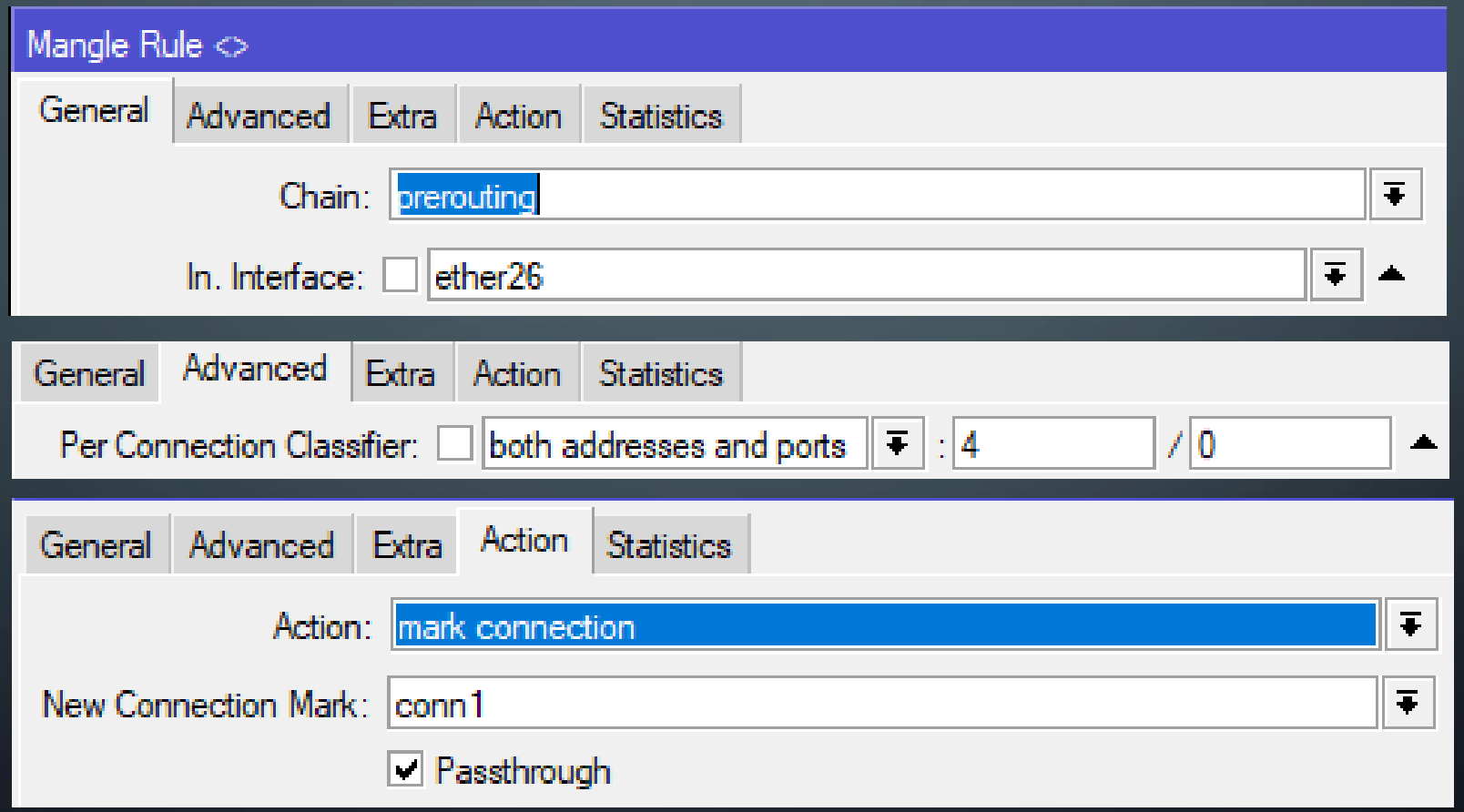




CONFIGURACIÓN DE ROUTING –CORE2

```
/routing ospf instance
set [ find default=yes ] router-id=3.3.3.3

/routing ospf network
add area=backbone network=10.10.0.192/26
add area=backbone network=10.10.0.128/26
add area=backbone network=10.10.0.0/26
```

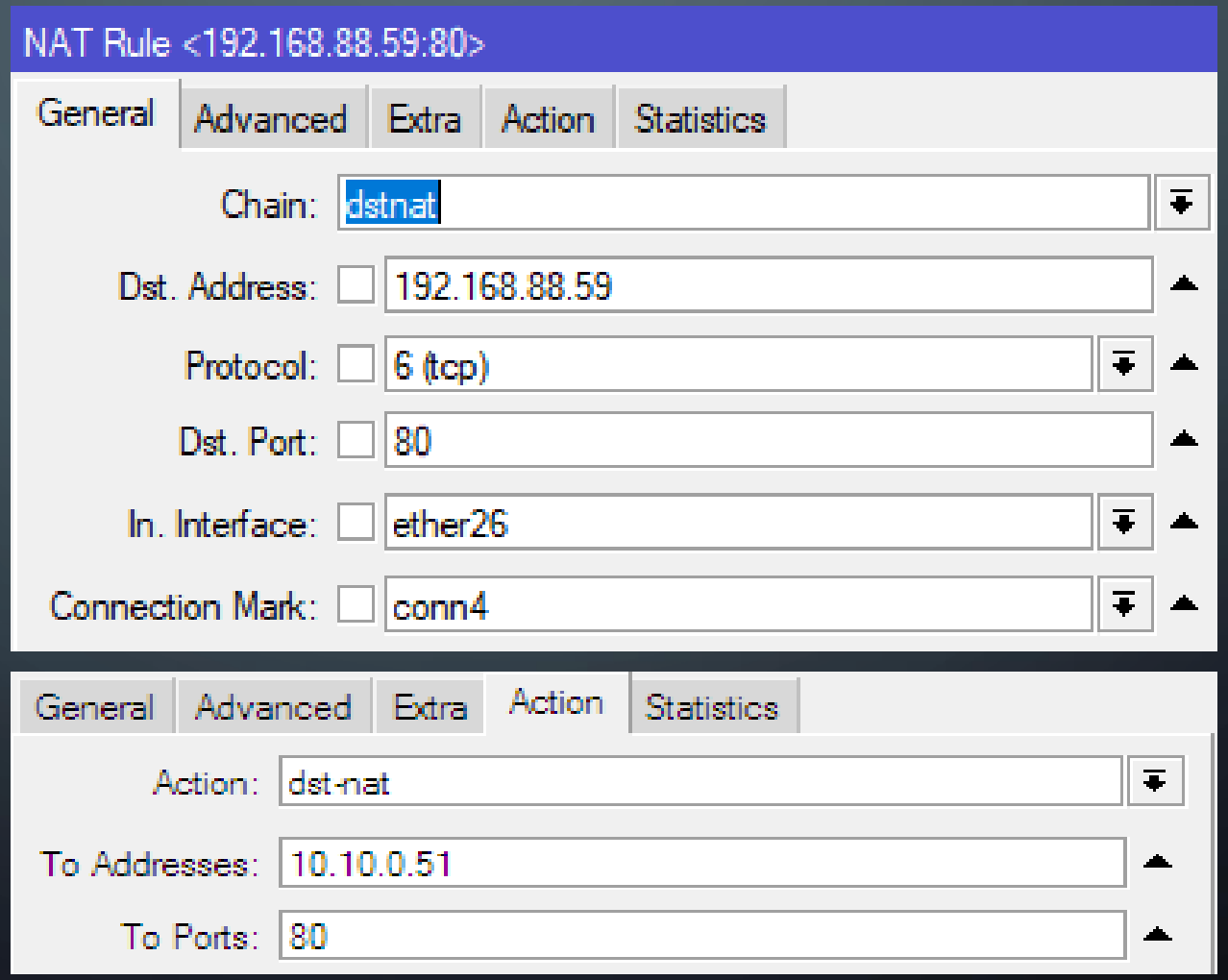
MARCADO DE PAQUETES –ROUTER EDGE
IP > FIREWALL > MANGLE



MARCADO DE PAQUETES –ROUTER EDGE
IP > FIREWALL > MANGLE

```
/ip firewall mangle
add action=mark-connection chain=prerouting in-interface=ether26 \
    new-connection-mark=conn1 passthrough=yes per-connection-classifier=\
    both-addresses-and-ports:4/0
add action=mark-connection chain=prerouting in-interface=ether26 \
    new-connection-mark=conn2 passthrough=yes per-connection-classifier=\
    both-addresses-and-ports:4/1
add action=mark-connection chain=prerouting in-interface=ether26 \
    new-connection-mark=conn3 passthrough=yes per-connection-classifier=\
    both-addresses-and-ports:4/2
add action=mark-connection chain=prerouting in-interface=ether26 \
    new-connection-mark=conn4 passthrough=yes per-connection-classifier=\
    both-addresses-and-ports:4/3
```

BALANCEO DE SOLICITUDES WEB – DSTNAT
IP > FIREWALL > NAT



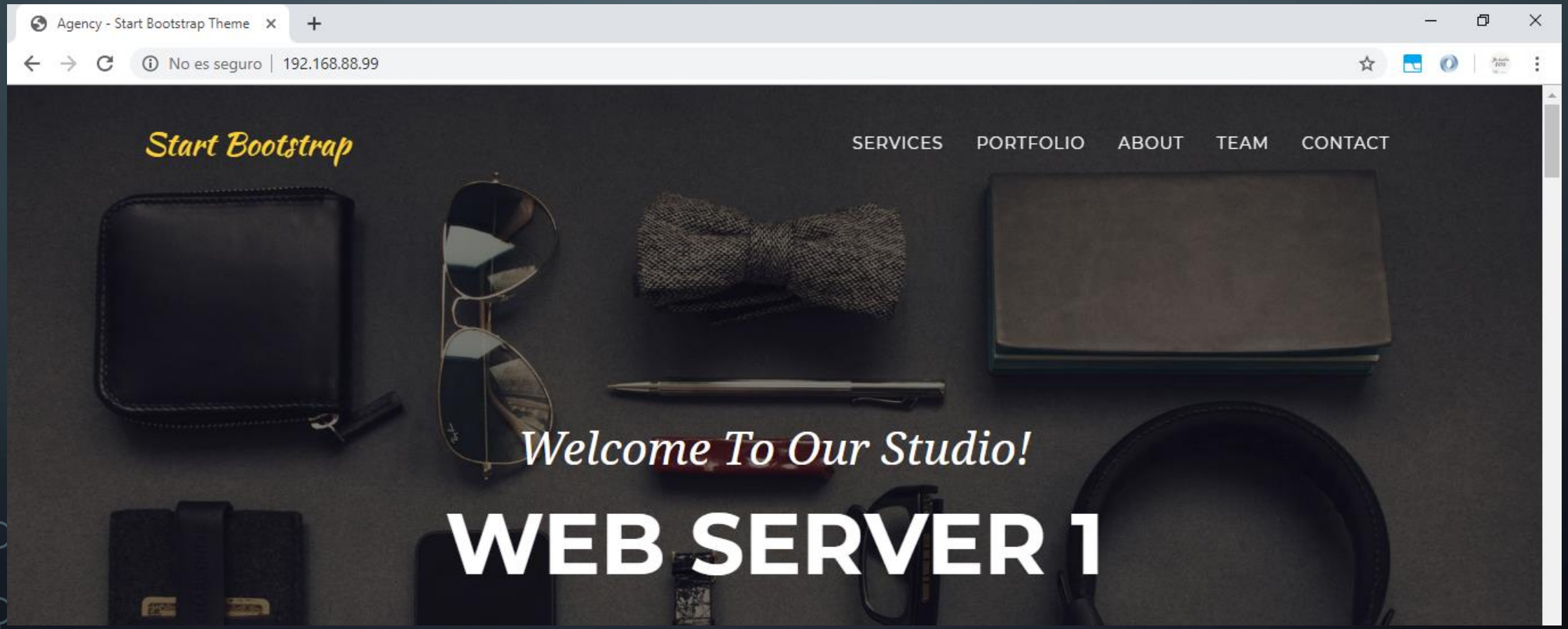
BALANCEO DE SOLICITUDES WEB – DSTNAT
IP > FIREWALL > NAT

```
/ip firewall nat
add action=dst-nat chain=dstnat comment=DST-NAT-1 connection-mark=conn1 \
    dst-port=80 protocol=tcp to-addresses=10.10.0.51 to-ports=80
add action=dst-nat chain=dstnat comment=DST-NAT-2 connection-mark=conn2 \
    dst-port=80 protocol=tcp to-addresses=10.10.0.52 to-ports=80
add action=dst-nat chain=dstnat comment=DST-NAT-3 connection-mark=conn3 \
    dst-port=80 protocol=tcp to-addresses=10.10.0.53 to-ports=80
add action=dst-nat chain=dstnat comment=DST-NAT-4 connection-mark=conn4 \
    dst-port=80 protocol=tcp to-addresses=10.10.0.54 to-ports=80
add action=dst-nat chain=dstnat disabled=yes dst-address=192.168.88.92 \
    in-interface=ether26 to-addresses=10.10.0.61
```

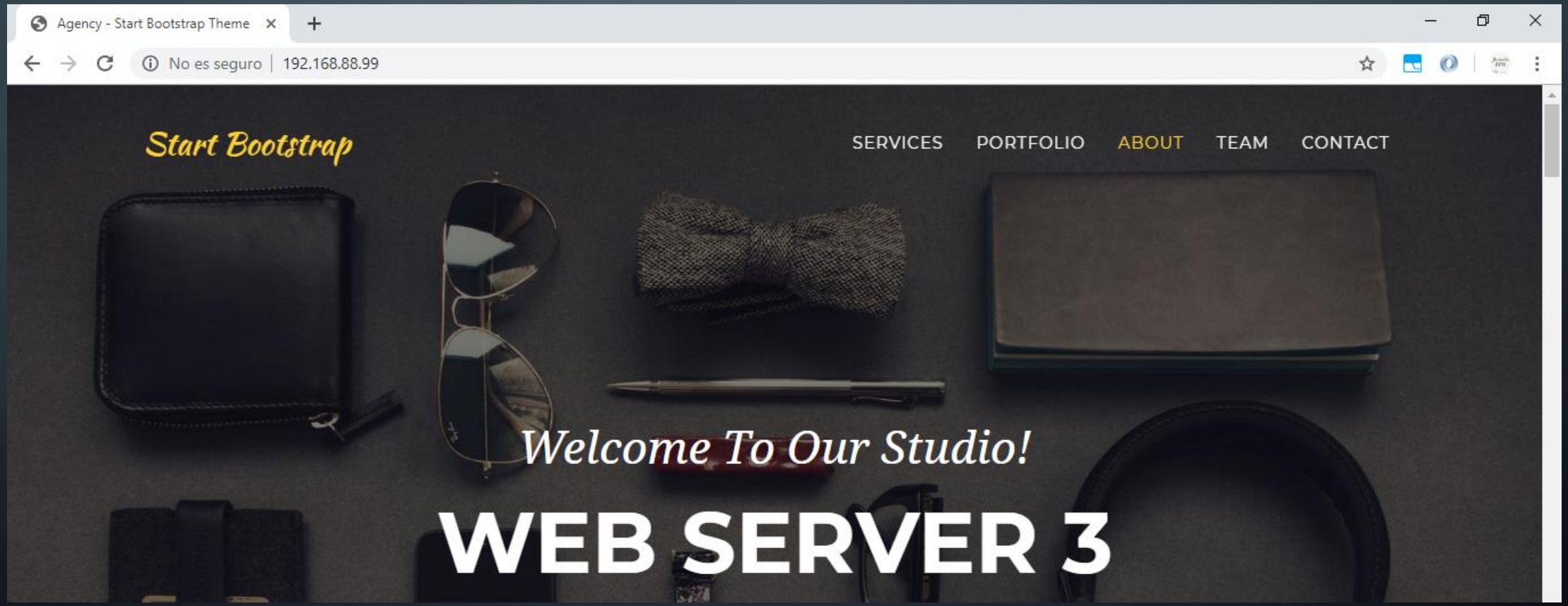
DIRECCIONES IP DE SERVIDORES

```
/ip dhcp-server lease
add address=10.10.0.52 client-id=\
    ff:b5:5e:67:ff:0:2:0:0:ab:11:bd:91:e9:61:4e:10:2b:c8 comment=S2 \
    mac-address=00:50:00:00:0B:00 server=dhcp1
add address=10.10.0.51 client-id=\
    ff:b5:5e:67:ff:0:2:0:0:ab:11:c5:2a:d9:30:93:b6:78:ea comment=S1 \
    mac-address=00:50:00:00:0A:00 server=dhcp1
add address=10.10.0.54 client-id=\
    ff:b5:5e:67:ff:0:2:0:0:ab:11:86:9b:7c:ed:7f:67:29:3c comment=S4 \
    mac-address=00:50:00:00:0D:00 server=dhcp1
add address=10.10.0.53 client-id=\
    ff:b5:5e:67:ff:0:2:0:0:ab:11:f7:24:37:38:3d:7:2a:c5 comment=S3 mac-address=\
    00:50:00:00:0C:00 server=dhcp1
```

PRUEBAS – REQUEST WEB TO 192.168.88.99

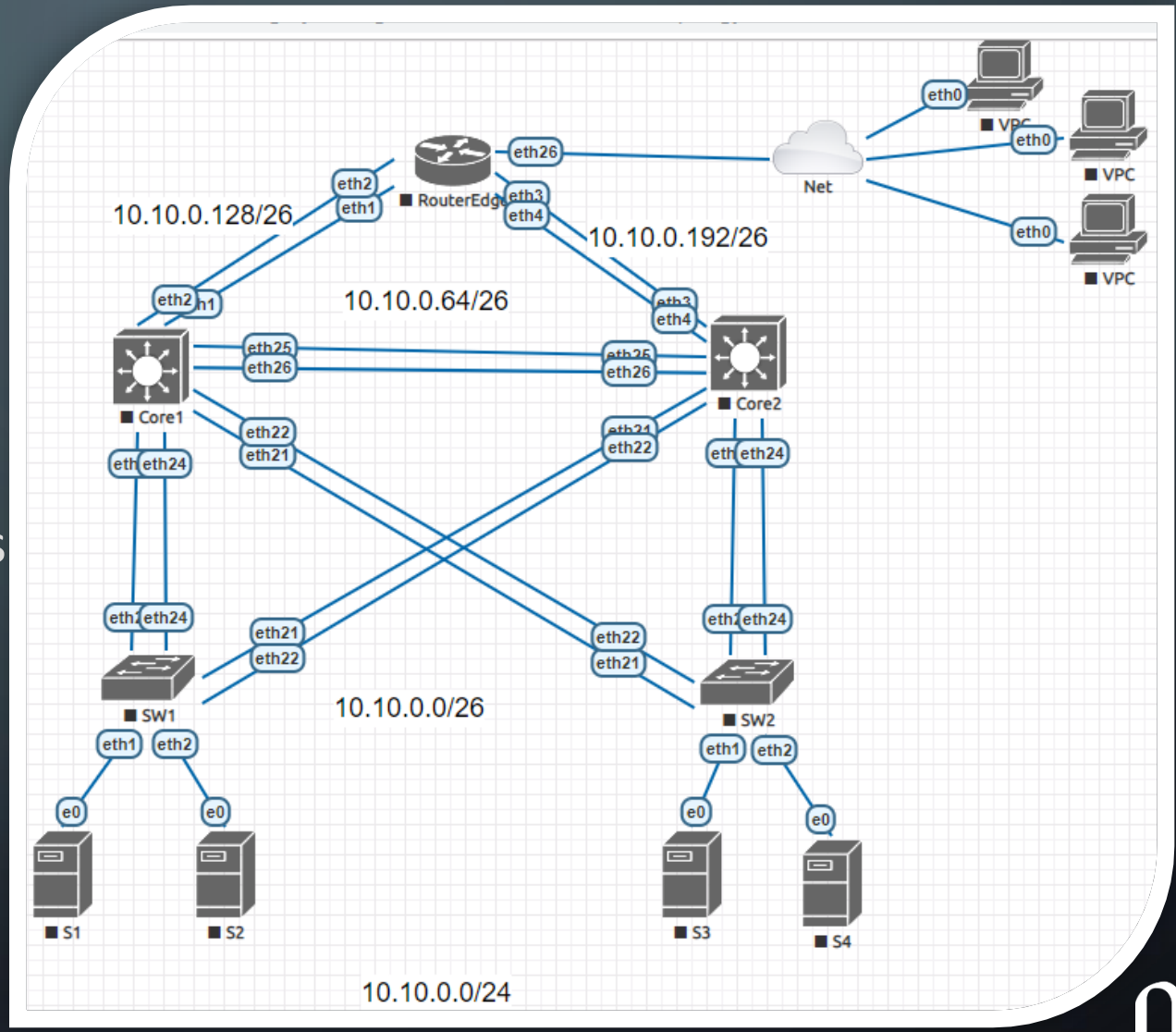


PRUEBAS – REQUEST WEB TO 192.168.88.99 DESDE OTRO DISPOSITIVO



RESULTADOS

- Varios usuarios que acceden a los servidores de manera balanceada a distintos servidores



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- https://wiki.mikrotik.com/wiki/Manual:IP/Firewall/NAT
- https://wiki.mikrotik.com/wiki/Manual:PCC

PREGUNTAS?

GRACIAS