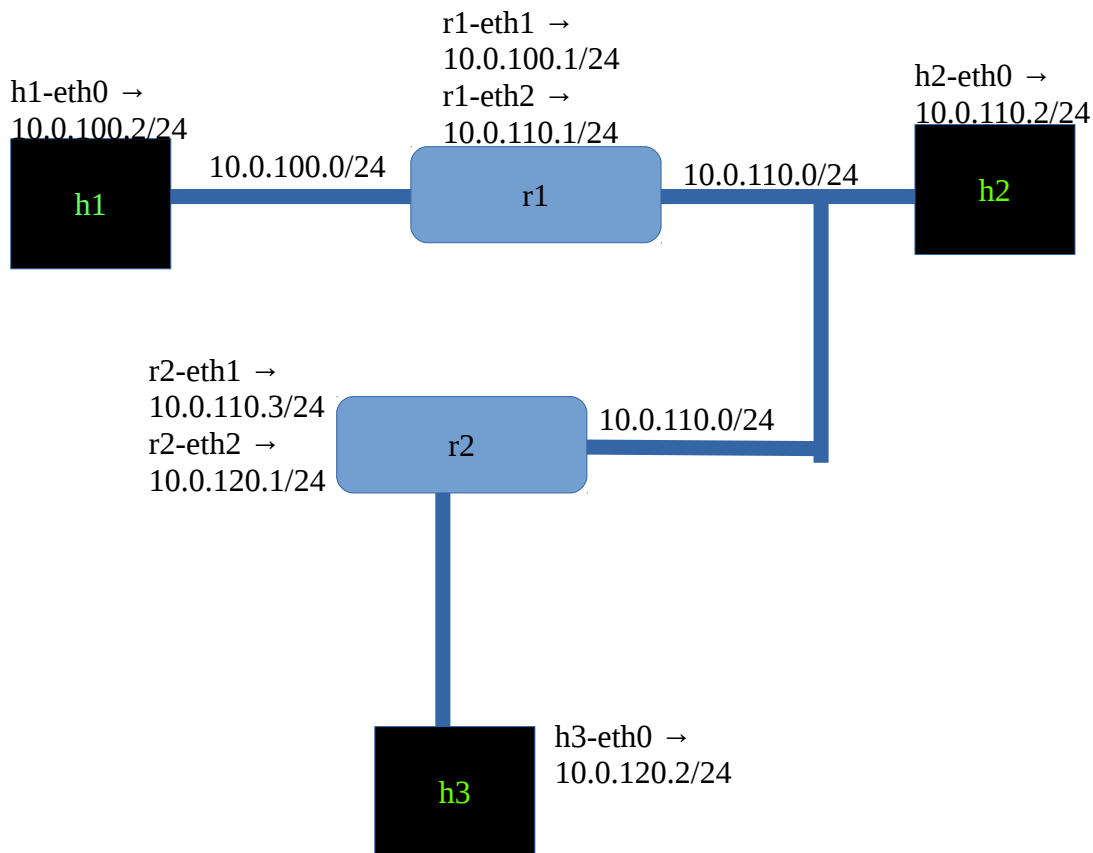


ESQUEMA DE ESCENARIO 3



COMANDOS DE CONFIGURACIÓN

ASIGNAR IP's A LAS INTERFACES

#ip a → para comprobar las interfaces.

#ip a add → Para añadir ip a las interfaces de red.

```
"Node: h1" (on mininet-vm)
root@mininet-vm:~# ip a add 10.0.100.2/24 dev h1-eth0
root@mininet-vm:~# ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default
    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
2: h1-eth0@if22: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP group default qlen 1000
    link/ether 6e:e6:98:50:81:37 brd ff:ff:ff:ff:ff:ff
    inet 10.0.100.2/24 scope global h1-eth0
        valid_lft forever preferred_lft forever
root@mininet-vm:~#
```

```
"Node: r1" (on mininet-virtual-machine)
root@mininet-virtual-machine:~# ip a add 10.0.100.1/24 dev r1-eth1
root@mininet-virtual-machine:~# ip a add 10.0.110.1/24 dev r1-eth2
root@mininet-virtual-machine:~# ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default
    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
2: r1-eth1@if25: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast sta
    te UP group default qlen 1000
    link/ether c2:2a:94:31:5a:b9 brd ff:ff:ff:ff:ff:ff
    inet 10.0.100.1/24 scope global r1-eth1
        valid_lft forever preferred_lft forever
3: r1-eth2@if26: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast sta
    te UP group default qlen 1000
    link/ether ce:c3:d9:0d:66:76 brd ff:ff:ff:ff:ff:ff
    inet 10.0.110.1/24 scope global r1-eth2
        valid_lft forever preferred_lft forever
root@mininet-virtual-machine:~#
```

```
"Node: h2" (on mininet-virtual-machine)
root@mininet-virtual-machine:~# ip a add 10.0.110.2/24 dev h2-eth0
root@mininet-virtual-machine:~# ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default
    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
2: h2-eth0@if23: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast sta
    te UP group default qlen 1000
    link/ether d2:aa:4f:7f:ac:77 brd ff:ff:ff:ff:ff:ff
    inet 10.0.110.2/24 scope global h2-eth0
        valid_lft forever preferred_lft forever
root@mininet-virtual-machine:~#
```

```
"Node: r2" (on mininet-virtual-machine)
root@mininet-virtual-machine:~# ip a add 10.0.110.3/24 dev r2-eth1
root@mininet-virtual-machine:~# ip a add 10.0.120.1/24 dev r2-eth2
root@mininet-virtual-machine:~# ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default
    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
2: r2-eth1@if27: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast sta
    te UP group default qlen 1000
    link/ether 52:cb:05:76:72:54 brd ff:ff:ff:ff:ff:ff
    inet 10.0.110.3/24 scope global r2-eth1
        valid_lft forever preferred_lft forever
3: r2-eth2@if28: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast sta
    te UP group default qlen 1000
    link/ether 26:93:47:01:4e:5e brd ff:ff:ff:ff:ff:ff
    inet 10.0.120.1/24 scope global r2-eth2
        valid_lft forever preferred_lft forever
root@mininet-virtual-machine:~#
```

```
"Node: h3" (on mininet-virtual-machine)
root@mininet-virtual-machine:~# ip a add 10.0.120.2/24 dev h3-eth0
root@mininet-virtual-machine:~# ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default
    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
2: h3-eth0@if24: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP group default qlen 1000
    link/ether ca:e8:80:1a:f0:e8 brd ff:ff:ff:ff:ff:ff
    inet 10.0.120.2/24 scope global h3-eth0
        valid_lft forever preferred_lft forever
root@mininet-virtual-machine:~#
```

AÑADIR RUTAS DE ENCAMINAMIENTO

#ip r add → Para añadir ruta de encaminamiento.

#ip r → Para comprobar la tabla de encaminamiento.

```
"Node: h1" (on mininet-virtual-machine)
root@mininet-virtual-machine:~# ip r add 10.0.110.2 via 10.0.100.1
root@mininet-virtual-machine:~# ip r add 10.0.120.2 via 10.0.100.1
root@mininet-virtual-machine:~# ip r
10.0.100.0/24 dev h1-eth0 proto kernel scope link src 10.0.100.2
10.0.110.2 via 10.0.100.1 dev h1-eth0
10.0.120.2 via 10.0.100.1 dev h1-eth0
root@mininet-virtual-machine:~#

"Node: r1" (on mininet-virtual-machine)
root@mininet-virtual-machine:~# ip r add 10.0.120.2 via 10.0.110.3
root@mininet-virtual-machine:~# ip r
10.0.100.0/24 dev r1-eth1 proto kernel scope link src 10.0.100.1
10.0.110.0/24 dev r1-eth2 proto kernel scope link src 10.0.110.1
10.0.120.2 via 10.0.110.3 dev r1-eth2
root@mininet-virtual-machine:~#

"Node: h2" (on mininet-virtual-machine)
root@mininet-virtual-machine:~# ip r add 10.0.100.2 via 10.0.110.1
root@mininet-virtual-machine:~# ip r add 10.0.120.2 via 10.0.110.1
root@mininet-virtual-machine:~# ip r
10.0.100.2 via 10.0.110.1 dev h2-eth0
10.0.110.0/24 dev h2-eth0 proto kernel scope link src 10.0.110.2
10.0.120.2 via 10.0.110.1 dev h2-eth0
root@mininet-virtual-machine:~#

"Node: r2" (on mininet-virtual-machine)
root@mininet-virtual-machine:~# ip r add 10.0.100.2 via 10.0.110.1
root@mininet-virtual-machine:~# ip r
10.0.100.2 via 10.0.110.1 dev r2-eth1
10.0.110.0/24 dev r2-eth1 proto kernel scope link src 10.0.110.3
10.0.120.0/24 dev r2-eth2 proto kernel scope link src 10.0.120.1
root@mininet-virtual-machine:~#

"Node: h3" (on mininet-virtual-machine)
root@mininet-virtual-machine:~# ip r add 10.0.100.2 via 10.0.120.1
root@mininet-virtual-machine:~# ip r add 10.0.110.2 via 10.0.120.1
root@mininet-virtual-machine:~# ip r
10.0.100.2 via 10.0.120.1 dev h3-eth0
10.0.110.2 via 10.0.120.1 dev h3-eth0
10.0.120.0/24 dev h3-eth0 proto kernel scope link src 10.0.120.2
root@mininet-virtual-machine:~#
```

COMPROBAR CONECTIVIDAD ENTRE TODOS LOS NODOS

#ping ip_destino → Comprueba la conectividad entre los hosts.

CONECTIVIDAD ENTRE H1 Y H2

```
"Node: h1" (on mininet-vm)
root@mininet-vm:~# ping 10.0.110.2 -c5
PING 10.0.110.2 (10.0.110.2) 56(84) bytes of data.
64 bytes from 10.0.110.2: icmp_seq=1 ttl=63 time=2.12 ms
64 bytes from 10.0.110.2: icmp_seq=2 ttl=63 time=0.121 ms
64 bytes from 10.0.110.2: icmp_seq=3 ttl=63 time=0.110 ms
64 bytes from 10.0.110.2: icmp_seq=4 ttl=63 time=0.119 ms
64 bytes from 10.0.110.2: icmp_seq=5 ttl=63 time=0.121 ms

--- 10.0.110.2 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4004ms
rtt min/avg/max/mdev = 0.110/0.518/2.121/0.801 ms
root@mininet-vm:~#
```

CONECTIVIDAD ENTRE H1 Y H3

```
"Node: h1" (on mininet-vm)
root@mininet-vm:~# ping 10.0.120.2 -c5
PING 10.0.120.2 (10.0.120.2) 56(84) bytes of data.
64 bytes from 10.0.120.2: icmp_seq=1 ttl=62 time=0.871 ms
64 bytes from 10.0.120.2: icmp_seq=2 ttl=62 time=0.117 ms
64 bytes from 10.0.120.2: icmp_seq=3 ttl=62 time=0.130 ms
64 bytes from 10.0.120.2: icmp_seq=4 ttl=62 time=0.139 ms
64 bytes from 10.0.120.2: icmp_seq=5 ttl=62 time=0.140 ms

--- 10.0.120.2 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4002ms
rtt min/avg/max/mdev = 0.117/0.279/0.871/0.296 ms
root@mininet-vm:~#
```

CONECTIVIDAD ENTRE H2 Y H3

```
"Node: h1" (on mininet-vm)
root@mininet-vm:~# ping 10.0.120.2 -c5
PING 10.0.120.2 (10.0.120.2) 56(84) bytes of data.
64 bytes from 10.0.120.2: icmp_seq=1 ttl=62 time=0.871 ms
64 bytes from 10.0.120.2: icmp_seq=2 ttl=62 time=0.117 ms
64 bytes from 10.0.120.2: icmp_seq=3 ttl=62 time=0.130 ms
64 bytes from 10.0.120.2: icmp_seq=4 ttl=62 time=0.139 ms
64 bytes from 10.0.120.2: icmp_seq=5 ttl=62 time=0.140 ms

--- 10.0.120.2 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4002ms
rtt min/avg/max/mdev = 0.117/0.279/0.871/0.296 ms
root@mininet-vm:~#
```

CAPTURAR TRAFICO

#tcpdump → Para capturar el tráfico de paquetes de ICMP.

TRAFICO ENTRE H1 Y H3

```
"Node: r2" (on mininet-vm)
root@mininet-vm:~# tcpdump -i r2-eth1 -c 5
tcpdump: verbose output suppressed, use -v or -vv for full protocol decode
listening on r2-eth1, link-type EN10MB (Ethernet), capture size 262144 bytes
03:56:46.970738 IP 10.0.100.2 > 10.0.120.2: ICMP echo request, id 2070, seq 91, length 64
03:56:46.970806 IP 10.0.120.2 > 10.0.100.2: ICMP echo reply, id 2070, seq 91, length 64
03:56:47.391168 IP 10.0.120.2 > 10.0.100.2: ICMP echo request, id 2074, seq 79, length 64
03:56:47.391240 IP 10.0.100.2 > 10.0.120.2: ICMP echo reply, id 2074, seq 79, length 64
03:56:47.970805 IP 10.0.100.2 > 10.0.120.2: ICMP echo request, id 2070, seq 92, length 64
```

TRAFICO ENTRE H3 Y H1

```
"Node: r2" (on mininet-vm)
root@mininet-vm:~# tcpdump -i r2-eth2 -c 5
tcpdump: verbose output suppressed, use -v or -vv for full protocol decode
listening on r2-eth2, link-type EN10MB (Ethernet), capture size 262144 bytes
03:58:35.976452 IP 10.0.100.2 > 10.0.120.2: ICMP echo request, id 2070, seq 200, length 64
03:58:35.976505 IP 10.0.120.2 > 10.0.100.2: ICMP echo reply, id 2070, seq 200, length 64
03:58:36.392292 IP 10.0.120.2 > 10.0.100.2: ICMP echo request, id 2074, seq 188, length 64
03:58:36.392397 IP 10.0.100.2 > 10.0.120.2: ICMP echo reply, id 2074, seq 188, length 64
03:58:36.975440 IP 10.0.100.2 > 10.0.120.2: ICMP echo request, id 2070, seq 201, length 64
```