

(15 + 6 + 3) = 24 = 4

Topología:

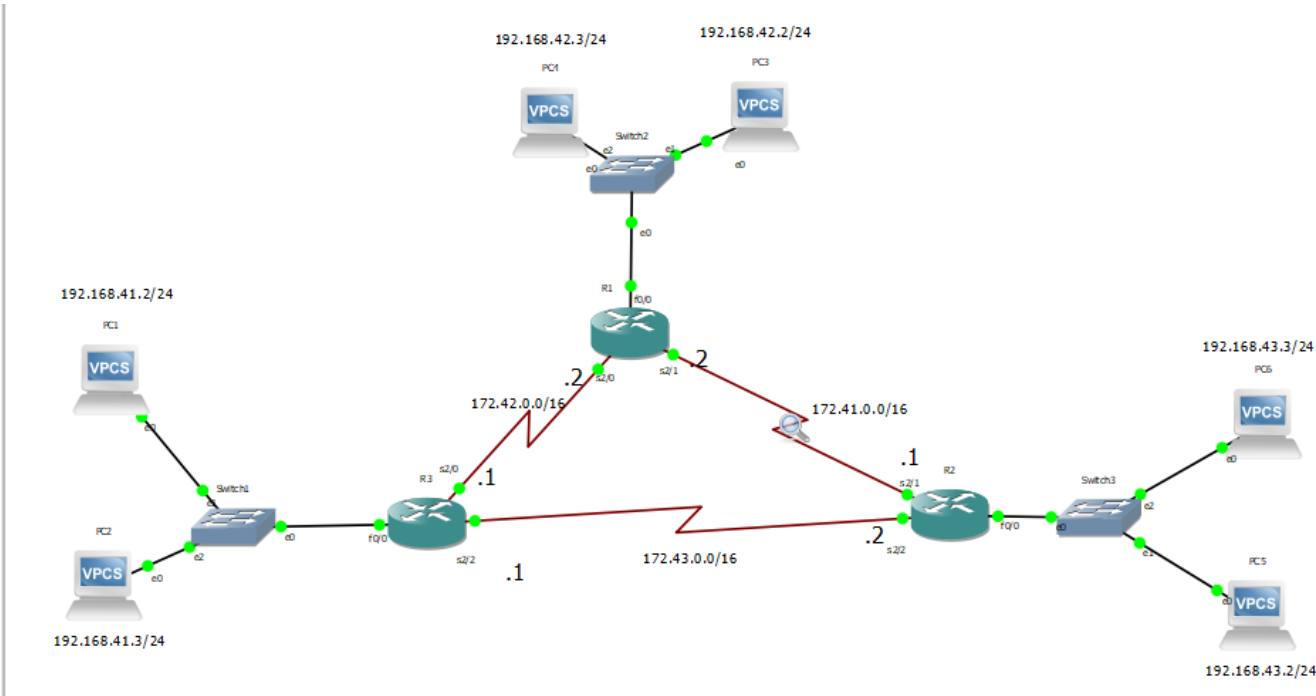


Tabla de IP's:

Máquina	IP	Gateway	
1	192.168.41.2/24	192.168.41.1	
2	192.168.41.3/24	192.168.41.1	
3	192.168.42.2/24	192.168.42.1	
4	192.168.42.3/24	192.168.42.1	
5	192.168.43.2/24	192.168.43.1	
6	192.168.43.3/24	192.168.43.1	
Conexión	Dirección de Red	Primera Dirección Asignable	Gateway
R1-R2	172.41.0.0/16	172.41.0.1	N.A.
R1-R3	172.42.0.0/16	172.42.0.1	N.A.
R2-R3	172.43.0.0/16	172.43.0.1	N.A.

R1:

```
R1#conf
R1#configure ter
R1#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#inte
R1(config)#interface se
R1(config)#interface serial 2/0
R1(config-if)#ip ad
R1(config-if)#ip addre
R1(config-if)#ip address 172.42.0.2/16
      ^
% Invalid input detected at '^' marker.

R1(config-if)#ip address 172.42.0.2 255.255.0.0
R1(config-if)#no shu
R1(config-if)#no shutdown
R1(config-if)#exit
R1(config)#inte
R1(config)#interface fa
*Mar  1 00:03:04.903: %LINK-3-UPDOWN: Interface Serial2/0, changed state to up
*Mar  1 00:03:05.903: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0,
changed state to up
R1(config)#interface fa
R1(config)#interface fastEthernet 0/0
R1(config-if)#ip add
R1(config-if)#ip address 192.168.42.1 255.255
*Mar  1 00:03:35.335: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0,
changed state to down
R1(config-if)#ip address 192.168.42.1 255.255.255.0
R1(config-if)#no shu
R1(config-if)#no shutdown
R1(config-if)#exit
R1(config)#
*Mar  1 00:03:46.407: %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state t
o up
*Mar  1 00:03:47.407: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthern
et0/0, changed state to up
R1(config)#int
R1(config)#interface se
R1(config)#interface serial 2/1
R1(config-if)#ip ad
R1(config-if)#ip add
R1(config-if)#ip address 172.41.0.2 255.255.0.0
R1(config-if)#no shu
R1(config-if)#no shutdown
R1(config-if)#exit
R1(config)#
*Mar  1 00:04:29.567: %LINK-3-UPDOWN: Interface Serial2/1, changed state to up
R1(config)#
*Mar  1 00:04:30.571: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/1, changed state to up
R1(config)#
```

```
12/0, changed state to up
R1(config)#inte
R1(config)#interface ser
R1(config)#interface serial 2/1
R1(config-if)#ip ro
R1(config-if)#ip route 192.168.43.0 255.255.255.0 172.41.0.1
R1(config)#inter
R1(config)#interface ser
R1(config)#interface serial 2/0
R1(config-if)#ip rou
R1(config-if)#ip route 192.168.41.0 255.255.255.0 172.42.0.1
R1(config)#
```

R2:

```
R2
*Mar 1 00:00:17.443: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0,
changed state to down
*Mar 1 00:00:17.459: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/1,
changed state to down
*Mar 1 00:00:17.471: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/2,
changed state to down
*Mar 1 00:00:17.487: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/3,
changed state to down
R2#en
R2#enable
R2#conf
R2#configure ter
R2#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#inte
R2(config)#interface ser
R2(config)#interface serial 2/1
R2(config-if)#ip add
R2(config-if)#ip address 172.41.0.1 255.255.0.0
R2(config-if)#no su
R2(config-if)#no shu
R2(config-if)#no shutdown
R2(config-if)#exit
R2(config)#inter
R2(config)#interface se
R2(config)#interface serial
*Mar 1 00:05:56.823: %LINK-3-UPDOWN: Interface Serial2/1, changed state to up
R2(config)#interface serial
*Mar 1 00:05:57.827: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/1, changed state to up
R2(config)#interface serial 2/2
R2(config-if)#ip add
R2(config-if)#ip address 172.43.0.2 255.255.0.0
R2(config-if)#no shu
R2(config-if)#no shutdown
R2(config-if)#exit
R2(config)#int
R2(config)#interface
*Mar 1 00:06:32.799: %LINK-3-UPDOWN: Interface Serial2/2, changed state to up
R2(config)#interface
*Mar 1 00:06:33.803: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/2, changed state to up
R2(config)#interface fas
R2(config)#interface fastEthernet 0/0
R2(config-if)#ip address 192.168.43.1
*Mar 1 00:06:55.343: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/2, changed state to down
R2(config-if)#ip address 192.168.43.1 255.255.255.0
R2(config-if)#no shutdown
R2(config-if)#exit
R2(config)#
*Mar 1 00:07:05.931: %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to up
*Mar 1 00:07:06.931: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
R2(config)#
```

```
R2(config)#inter
R2(config)#interface serial 2/1
R2(config-if)#ip route
R2(config-if)#ip rout
R2(config-if)#ip route 192.168.42.0 255.255.255.0 172.41.0.2
R2(config)#inte
R2(config)#interface ser
R2(config)#interface serial 2/2
R2(config-if)#ip route 192.168.41.0 255.255.255.0 172.43.0.1
R2(config)#
```

R3:

```
changed state to down
R3#inter
R3#enable
R3#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R3(config)#inter
R3(config)#interface se
R3(config)#interface serial 2/0
R3(config-if)#ip address 172.42.0.1 255.255.0.0
R3(config-if)#no shutdown
R3(config-if)#exit
R3(config)#inte
R3(config)#interface
*Mar 1 00:08:26.683: %LINK-3-UPDOWN: Interface Serial2/0, changed state to up
R3(config)#interface ser
R3(config)#interface serial
*Mar 1 00:08:27.687: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
R3(config)#interface serial 2/2
R3(config-if)#ip add
R3(config-if)#ip address 172.43.0.1 255.255.0.0
R3(config-if)#no shu
R3(config-if)#no shutdown
R3(config-if)#exit
R3(config)#inter
R3(config)#interface fas
R3(config)#interface fastEthernet
*Mar 1 00:08:46.847: %LINK-3-UPDOWN: Interface Serial2/2, changed state to up
*Mar 1 00:08:47.879: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/2, changed state to up
R3(config)#interface fastEthernet 0/0
R3(config-if)#ip add
R3(config-if)#ip address 192.168.41.1 255.255.255.0
R3(config-if)#no shut
R3(config-if)#no shutdown
R3(config-if)#exit
R3(config)#
*Mar 1 00:09:35.535: %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to up
*Mar 1 00:09:36.535: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
R3(c
```

```
Enter configuration commands, one per line. End with CNTL/Z.
R3(config)#inter
R3(config)#interface ser
R3(config)#interface serial 2/2
R3(config-if)#ip route 192.168.43.0 255.255.255.0 172.43.0.2
R3(config)#interface serial 2/0
R3(config-if)#ip route 192.168.42.0 255.255.255.0 172.42.0.2
R3(config)#
```

PC1:

```
PC1> ip 192.168.41.2 255.255.255.0 192.168.41.1
Checking for duplicate address...
PC1 : 192.168.41.2 255.255.255.0 gateway 192.168.41.1

PC1> save
Saving startup configuration to startup.vpc
. done

PC1> █
```

PC2:

```
PC2> ip 192.168.41.3 255.255.255.0 192.168.41.1
Checking for duplicate address...
PC2 : 192.168.41.3 255.255.255.0 gateway 192.168.41.1

PC2> save
Saving startup configuration to startup.vpc
. done

PC2> █
```

PC3:

```
PC3> ip 192.168.42.2 255.255.255.0 192.168.42.1
Checking for duplicate address...
PC3 : 192.168.42.2 255.255.255.0 gateway 192.168.42.1

PC3> save
Saving startup configuration to startup.vpc
. done

PC3> █
```

PC4:

```
PC4> ip 192.168.42.3 255.255.255.0 192.168.42.1
Checking for duplicate address...
PC4 : 192.168.42.3 255.255.255.0 gateway 192.168.42.1

PC4> save
Saving startup configuration to startup.vpc
. done

PC4> █
```

PC5:

```
PC5> ip 192.168.43.2 255.255.255.0 192.168.43.1
Checking for duplicate address...
PC5 : 192.168.43.2 255.255.255.0 gateway 192.168.43.1

PC5> save
Saving startup configuration to startup.vpc
. done

PC5> █
```

PC6:

```
PC6> ip 192.168.43.3 255.255.255.0 192.168.43.1
Checking for duplicate address...
PC6 : 192.168.43.3 255.255.255.0 gateway 192.168.43.1

PC6> save
Saving startup configuration to startup.vpc
. done
```

Ping de referencia (PC6 -> PC4, PC6 -> PC2):

```
PC6> ping 192.168.42.3

192.168.42.3 icmp_seq=1 timeout
84 bytes from 192.168.42.3 icmp_seq=2 ttl=62 time=90.283 ms
84 bytes from 192.168.42.3 icmp_seq=3 ttl=62 time=109.912 ms
84 bytes from 192.168.42.3 icmp_seq=4 ttl=62 time=119.919 ms
84 bytes from 192.168.42.3 icmp_seq=5 ttl=62 time=126.337 ms

PC6> ping 192.168.41.3

192.168.41.3 icmp_seq=1 timeout
84 bytes from 192.168.41.3 icmp_seq=2 ttl=62 time=84.476 ms
84 bytes from 192.168.41.3 icmp_seq=3 ttl=62 time=153.257 ms
84 bytes from 192.168.41.3 icmp_seq=4 ttl=62 time=109.563 ms
84 bytes from 192.168.41.3 icmp_seq=5 ttl=62 time=88.525 ms

PC6> █
```

Tabla de Ruteo de Cada Router:

R1:

```

R1#show ip route
Codes: C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2
       i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
       ia - IS-IS inter area, * - candidate default, U - per-user static route
       o - ODR, P - periodic downloaded static route

Gateway of last resort is not set

S    192.168.43.0/24 [1/0] via 172.41.0.1
C    172.42.0.0/16 is directly connected, Serial2/0
C    172.41.0.0/16 is directly connected, Serial2/1
S    192.168.41.0/24 [1/0] via 172.42.0.1
C    192.168.0.0/16 is directly connected, FastEthernet0/0
R1# █
```

R2:

```
R2#show ip route
Codes: C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2
       i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
       ia - IS-IS inter area, * - candidate default, U - per-user static route
       o - ODR, P - periodic downloaded static route

Gateway of last resort is not set

S    192.168.42.0/24 [1/0] via 172.41.0.2
C    192.168.43.0/24 is directly connected, FastEthernet0/0
C    172.43.0.0/16 is directly connected, Serial2/2
C    172.41.0.0/16 is directly connected, Serial2/1
S    192.168.41.0/24 [1/0] via 172.43.0.1
R2#
```

R3:

```
R3#show ip route
Codes: C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2
       i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
       ia - IS-IS inter area, * - candidate default, U - per-user static route
       o - ODR, P - periodic downloaded static route

Gateway of last resort is not set

S    192.168.42.0/24 [1/0] via 172.42.0.2
S    192.168.43.0/24 [1/0] via 172.43.0.2
C    172.42.0.0/16 is directly connected, Serial2/0
C    172.43.0.0/16 is directly connected, Serial2/2
C    192.168.41.0/24 is directly connected, FastEthernet0/0
R3#
```

Ping de referencia desde GNS (PC6 -> PC4):

84 bytes from 192.168.42.3 icmp_seq=5 ttl=62 time=94.806 ms PC6> ping 192.168.42.3 84 bytes from 192.168.42.3 icmp_seq=1 ttl=62 time=115.349 ms 84 bytes from 192.168.42.3 icmp_seq=2 ttl=62 time=110.542 ms 84 bytes from 192.168.42.3 icmp_seq=3 ttl=62 time=109.874 ms 84 bytes from 192.168.42.3 icmp_seq=4 ttl=62 time=106.426 ms 84 bytes from 192.168.42.3 icmp_seq=5 ttl=62 time=105.605 ms PC6> [ ]	TIME	SOURCE	DESTINATION	PROTOCOL	LENGTH	INFO	
	1	0.000000	N/A	N/A	CDP	325	Device ID: R2 Port ID: S
	2	3.502298	192.168.43.3	192.168.42.3	ICMP	88	Echo (ping) request id=0
	3	3.584119	192.168.42.3	192.168.43.3	ICMP	88	Echo (ping) reply id=0
	4	4.636775	192.168.43.3	192.168.42.3	ICMP	88	Echo (ping) request id=0
	5	4.676611	192.168.42.3	192.168.43.3	ICMP	88	Echo (ping) reply id=0
	6	5.714067	N/A	N/A	SLARP	24	Line keepalive, outgoing
	7	5.748956	192.168.43.3	192.168.42.3	ICMP	88	Echo (ping) request id=0
	8	5.768677	N/A	N/A	SLARP	24	Line keepalive, outgoing
	9	5.813798	192.168.42.3	192.168.43.3	ICMP	88	Echo (ping) reply id=0
	10	6.873274	192.168.43.3	192.168.42.3	ICMP	88	Echo (ping) request id=0
	11	6.923642	192.168.42.3	192.168.43.3	ICMP	88	Echo (ping) reply id=0