

**DIPLOMADO DE PROFUNDIZACION CISCO
(DISEÑO E INPLEMENTACION DE SOLUCIONES INTEGRADAS LAN / WAN)**

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Paso 11 - Prueba de Habilidades en la Plataforma CISCO

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INTRODUCCION

El diplomado está constituido por dos módulos: Network Fundamentals (CCNA1 R&S) y Routing and Switching Fundamentals (CCNA2 R&S), los cuales forman parte del currículo CCNA R&S adscrito a la Academia CISCO.

Algunos conceptos relacionados con la configuración de sistemas operativos de red, protocolos de comunicación, mecanismos de acceso al medio y características de la capa de red, asignación de direcciones IP, subnetting y capa de aplicación.

Enrutamiento estático, enrutamiento dinámico, enrutamiento mediante protocolos de estado enlace, listas de acceso, asignación dinámica de direcciones IP y traducciones de direcciones IP mediante NAT. El uso de protocolos basados en STP y VLANs bajo una arquitectura jerárquica.

Para este trabajo se utilizan dos topologías, escenario 1: Una empresa posee sucursales distribuidas en las ciudades de Bogotá y Medellín, en donde el estudiante será el administrador de la red, el cual deberá configurar e interconectar entre sí cada uno de los dispositivos que forman parte del escenario, acorde con los lineamientos establecidos para el direccionamiento IP, protocolos de enrutamiento y demás aspectos que forman parte de la topología de red.

Donde se plantea trabajar con protocolo RIP, encapsulamiento PPP, habilitar NAT, configuración del servicio en DHCP.

El otro escenario es una empresa de Tecnología posee tres sucursales distribuidas en las ciudades de Miami, Bogotá y Buenos Aires, en donde el estudiante será el administrador de la red, el cual deberá configurar e interconectar entre sí cada uno de los dispositivos que forman parte del escenario, acorde con los lineamientos establecidos para el direccionamiento IP, protocolos de enrutamiento y demás aspectos que forman parte de la topología de red.

Para este configuraremos el direccionamiento IP, trabajar protocolo de enrutamiento OSPFv2, interfaces por OSPF, DHCP and NAT y la utilización de otros comandos.

Estos dos escenarios se desarrollan las habilidades adquiridas en el transcurso del diplomado "CCNA de CISCO", se van a ejecutar a través de la herramienta de simulación Packet Tracer.

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ESCENARIO 1

Una empresa posee sucursales distribuidas en las ciudades de Bogotá y Medellín, en donde el estudiante será el administrador de la red, el cual deberá configurar e interconectar entre sí cada uno de los dispositivos que forman parte del escenario, acorde con los lineamientos establecidos para el direccionamiento IP, protocolos de enrutamiento y demás aspectos que forman parte de la topología de red.

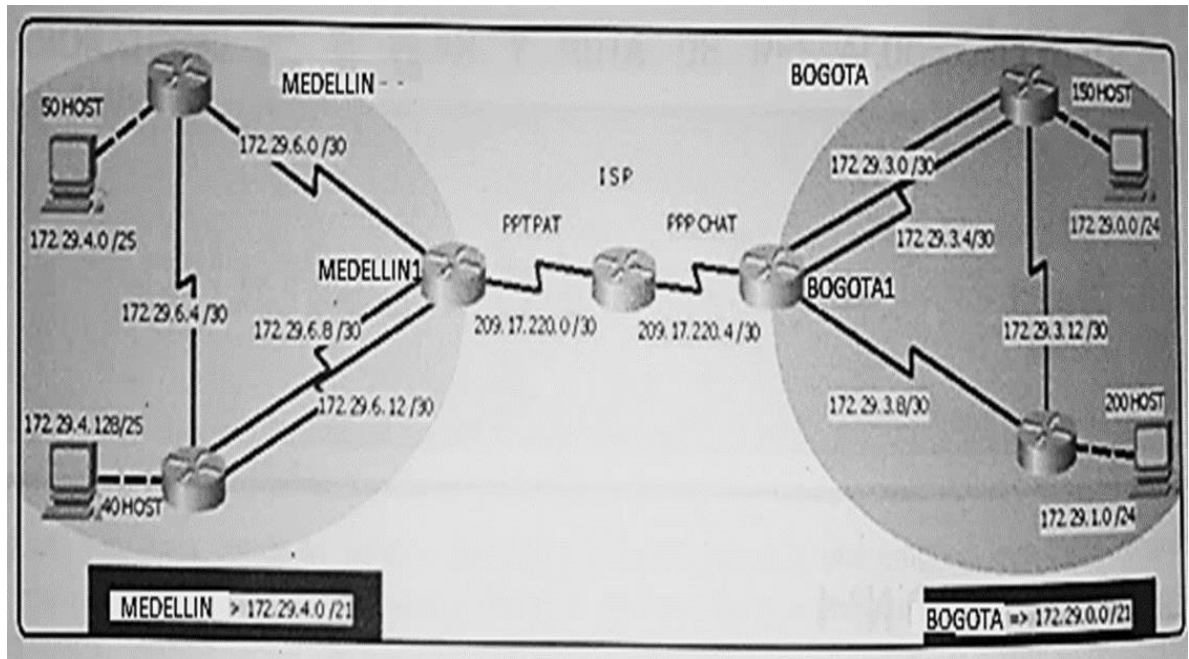


Ilustración 1 Topología descrita a trabajar

Este escenario plantea el uso de RIP como protocolo de enrutamiento, considerando que se tendrán rutas por defecto redistribuidas; así mismo, habilitar el encapsulamiento PPP y su autenticación. Los router Bogota2 y medellin2 proporcionan el servicio DHCP a su propia red LAN y a los router 3 de cada ciudad. Debe configurar PPP en los enlaces hacia el ISP, con autenticación. Debe habilitar NAT de sobrecarga en los router Bogota1 y medellin1.

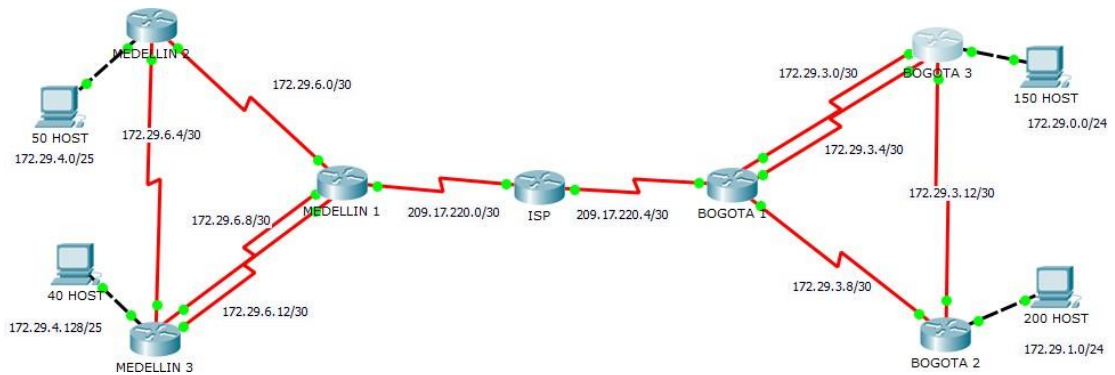


Ilustración 2 topología en Packet Tracer

PARTE 1: CONFIGURACIÓN DEL ENRUTAMIENTO

- a. Configurar el enrutamiento en la red usando el protocolo RIP versión 2, declare la red principal, desactive la sumarización automática.

MEDELLIN 1 RIP

```
Router>enable
```

```
Router#config t
```

Enter configuration commands, one per line. End with CNTL/Z.

```
Router(config)#router rip
```

```
Router(config-router)#version 2
```

```
Router(config-router)#no auto-summary
```

```
Router(config-router)#do show ip route connected
```

```
C 172.29.6.0/30 is directly connected, Serial0/0/1
```

```
C 172.29.6.8/30 is directly connected, Serial0/1/0
```

```
C 172.29.6.12/30 is directly connected, Serial0/1/1
```

```
C 209.17.220.0/30 is directly connected, Serial0/0/0
```

```
Router(config-router)#network 172.29.6.0
```

```
Router(config-router)#network 172.29.6.8
```

```
Router(config-router)#network 172.29.6.12
```

```
Router(config-router)#pasi
% Invalid input detected at '^' marker.
```

```
Router(config-router)#passive-interface s0/0/0
Router(config-router)#
```

MEDELLIN 2 RIP

```
Router>enable
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router rip
Router(config-router)#version 2
Router(config-router)#no auto-summary
Router(config-router)#do show ip route connected
C 172.29.4.0/25 is directly connected, GigabitEthernet0/0
C 172.29.6.0/30 is directly connected, Serial0/0/0
C 172.29.6.4/30 is directly connected, Serial0/0/1
Router(config-router)#network 172.29.4.0
Router(config-router)#network 172.29.6.0
Router(config-router)#network 172.29.6.4
Router(config-router)#passive-interfaceg0/0
% Invalid input detected at '^' marker.
Router(config-router)#passive-interface g0/0
Router(config-router)#
```

MEDELLIN 3 RIP

```
Router>enable
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router rip
Router(config-router)#version 2
```

```
Router(config-router)#no auto-summary
Router(config-router)#do show ip route connected
C 172.29.4.128/25 is directly connected, GigabitEthernet0/0
C 172.29.6.4/30 is directly connected, Serial0/1/0
C 172.29.6.8/30 is directly connected, Serial0/0/0
C 172.29.6.12/30 is directly connected, Serial0/0/1
Router(config-router)#network 172.29.4.128
Router(config-router)#network 172.29.6.4
Router(config-router)#network 172.29.6.8
Router(config-router)#network 172.29.6.12
Router(config-router)#passive-interface g0/0
Router(config-router)#
```

BOGOTA 1 RIP

```
Router>enable
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router rip
Router(config-router)#version 2
Router(config-router)#no auto-summary
Router(config-router)#do show ip route cnneted
Translating "cnneted"...domain server (255.255.255.255)
% Invalid input detected
Router(config-router)#do show ip route conneted
Translating "conneted"...domain server (255.255.255.255)
% Invalid input detected
Router(config-router)#do show ip route connected
C 172.29.3.0/30 is directly connected, Serial0/1/0
C 172.29.3.4/30 is directly connected, Serial0/1/1
C 172.29.3.8/30 is directly connected, Serial0/0/1
C 209.17.220.4/30 is directly connected, Serial0/0/0
```

```
Router(config-router)#network 172.29.3.0
Router(config-router)#network 172.29.3.4
Router(config-router)#network 172.29.3.8
Router(config-router)#passive-interface s0/0/0
Router(config-router)#
```

BOGOTA 2 RIP

```
Router>enable
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router rip
Router(config-router)#version 2
Router(config-router)#no auto-summary
Router(config-router)#do show ip route connected
C 172.29.1.0/24 is directly connected, GigabitEthernet0/0
C 172.29.3.8/30 is directly connected, Serial0/0/0
C 172.29.3.12/30 is directly connected, Serial0/0/1
Router(config-router)#network 172.29.1.0
Router(config-router)#network 172.29.3.8
Router(config-router)#network 172.29.3.12
Router(config-router)#passive-interface g0/0
Router(config-router)#
```

BOGOTA 3 RIP

```
Router>enable
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router rip
Router(config-router)#version 2
Router(config-router)#no auto-summary
Router(config-router)#do show ip route connected
```

C 172.29.0.0/24 is directly connected, GigabitEthernet0/0

C 172.29.3.0/30 is directly connected, Serial0/0/0

C 172.29.3.4/30 is directly connected, Serial0/0/1

C 172.29.3.12/30 is directly connected, Serial0/1/0

```
Router(config-router)#network 172.29.0.0
```

```
Router(config-router)#network 172.29.3.0
```

```
Router(config-router)#network 172.29.3.4
```

```
Router(config-router)#network 172.29.3.12
```

```
Router(config-router)#passive-interface g0/0
```

```
Router(config-router)#
```

```
Router(config-router)#
```

- b. Los router Bogota1 y Medellín deberán añadir a su configuración de enrutamiento una ruta por defecto hacia el ISP y, a su vez, redistribuirla dentro de las publicaciones de RIP.

MEDELLIN 1

```
Router>enable
```

```
Router#config t
```

Enter configuration commands, one per line. End with CNTL/Z.

```
Router(config)#ip route 0.0.0.0 0.0.0.0 209.17.220.1
```

```
Router(config)#router rip
```

```
Router(config-router)#default-information originate
```

```
Router(config-router)#
```

```
Router(config-router)#
```

VERIFICACION EN MEDELLIN 2

```
Router>enable
```

```
Router#show ip route
```

Codes: L - local, 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, E - EGP
i - IS-IS, 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 172.29.6.1 to network 0.0.0.0

172.29.0.0/16 is variably subnetted, 9 subnets, 3 masks

```
C    172.29.4.0/25 is directly connected, GigabitEthernet0/0
L    172.29.4.1/32 is directly connected, GigabitEthernet0/0
R    172.29.4.128/25 [120/1] via 172.29.6.6, 00:00:28, Serial0/0/1
C    172.29.6.0/30 is directly connected, Serial0/0/0
L    172.29.6.2/32 is directly connected, Serial0/0/0
C    172.29.6.4/30 is directly connected, Serial0/0/1
L    172.29.6.5/32 is directly connected, Serial0/0/1
R    172.29.6.8/30 [120/1] via 172.29.6.1, 00:00:04, Serial0/0/0
      [120/1] via 172.29.6.6, 00:00:28, Serial0/0/1
R    172.29.6.12/30 [120/1] via 172.29.6.1, 00:00:04, Serial0/0/0
      [120/1] via 172.29.6.6, 00:00:28, Serial0/0/1
R*  0.0.0.0/0 [120/1] via 172.29.6.1, 00:00:04, Serial0/0/0
```

Router#

EN BOGOTA 1

Router>enable

Router#config t

Enter configuration commands, one per line. End with CNTL/Z.

Router(config)#ip route 0.0.0.0 0.0.0.0 209.17.220.5

Router(config)#router rip

Router(config-router)#default-information originate

Router(config-router)#

VERIFICACION EN BOGOTA 3

Router>enable

```
Router#show ip route
```

```
Codes: L - local, 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, E - EGP  
i - IS-IS, 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 172.29.3.5 to network 0.0.0.0
```

```
172.29.0.0/16 is variably subnetted, 10 subnets, 3 masks
```

```
C 172.29.0.0/24 is directly connected, GigabitEthernet0/0  
L 172.29.0.1/32 is directly connected, GigabitEthernet0/0  
R 172.29.1.0/24 [120/1] via 172.29.3.13, 00:00:18, Serial0/1/0  
C 172.29.3.0/30 is directly connected, Serial0/0/0  
L 172.29.3.2/32 is directly connected, Serial0/0/0  
C 172.29.3.4/30 is directly connected, Serial0/0/1  
L 172.29.3.6/32 is directly connected, Serial0/0/1  
R 172.29.3.8/30 [120/1] via 172.29.3.5, 00:00:25, Serial0/0/1  
[120/1] via 172.29.3.1, 00:00:25, Serial0/0/0  
[120/1] via 172.29.3.13, 00:00:18, Serial0/1/0  
C 172.29.3.12/30 is directly connected, Serial0/1/0  
L 172.29.3.14/32 is directly connected, Serial0/1/0  
R* 0.0.0.0/0 [120/1] via 172.29.3.5, 00:00:25, Serial0/0/1  
[120/1] via 172.29.3.1, 00:00:25, Serial0/0/0
```

```
Router#
```

- c. El router ISP deberá tener una ruta estática dirigida hacia cada red interna de Bogotá y Medellín para el caso se sumarizan las subredes de cada uno a /22.

```
Router>enable
```

```
Router#config t
```

```
Enter configuration commands, one per line. End with CNTL/Z.
```

```
Router(config)#ip route 172.29.4.0 255.255.252.0 209.17.220.2
```

```
Router(config)#ip route 172.29.0.0 255.255.252.0 209.17.220.6
% Invalid input detected at '^' marker.
```

```
Router(config)#ip route 172.29.0.0 255.255.252.0 209.17.220.6
Router(config)#
Router(config)#
```

PARTE 2: TABLA DE ENRUTAMIENTO.

- a. Verificar la tabla de enrutamiento en cada uno de los routers para comprobar las redes y sus rutas.

Véase “Configurar el enrutamiento en la red usando el protocolo RIP versión 2” pag.4-8

- b. Verificar el balanceo de carga que presentan los routers.

```
Router#show ip route
```

```
Codes: L - local, 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, E - EGP
       i - IS-IS, 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 172.29.3.5 to network 0.0.0.0
```

```
172.29.0.0/16 is variably subnetted, 10 subnets, 3 masks
```

```
C    172.29.0.0/24 is directly connected, GigabitEthernet0/0
```

```
L    172.29.0.1/32 is directly connected, GigabitEthernet0/0
```

```
R    172.29.1.0/24 [120/1] via 172.29.3.13, 00:00:12, Serial0/1/0
```

```
C    172.29.3.0/30 is directly connected, Serial0/0/0
```

```
L    172.29.3.2/32 is directly connected, Serial0/0/0
```

```
C    172.29.3.4/30 is directly connected, Serial0/0/1
```

```
L 172.29.3.6/32 is directly connected, Serial0/0/1
```



```

R    172.29.3.8/30 [120/1] via 172.29.3.5, 00:00:25, Serial0/0/1
      [120/1] via 172.29.3.13, 00:00:12, Serial0/1/0
      [120/1] via 172.29.3.1, 00:00:25, Serial0/0/0
C    172.29.3.12/30 is directly connected, Serial0/1/0
L    172.29.3.14/32 is directly connected, Serial0/1/0
R*  0.0.0.0/0 [120/1] via 172.29.3.5, 00:00:25, Serial0/0/1
      [120/1] via 172.29.3.1, 00:00:25, Serial0/0/0

```

Router#

- c. Obsérvese en los routers Bogotá1 y Medellín1 cierta similitud por su ubicación, por tener dos enlaces de conexión hacia otro router y por la ruta por defecto que manejan.

Presentan cierta similitud.

- d. Los routers Medellín2 y Bogotá2 también presentan redes conectadas directamente y recibidas mediante RIP.

Véase la tabla de enrutamiento

- e. Las tablas de los routers restantes deben permitir visualizar rutas redundantes para el caso de la ruta por defecto.

```

R    172.29.3.8/30 [120/1] via 172.29.3.5, 00:00:25, Serial0/0/1
      [120/1] via 172.29.3.13, 00:00:12, Serial0/1/0
      [120/1] via 172.29.3.1, 00:00:25, Serial0/0/0
C    172.29.3.12/30 is directly connected, Serial0/1/0
L    172.29.3.14/32 is directly connected, Serial0/1/0
R*  0.0.0.0/0 [120/1] via 172.29.3.5, 00:00:25, Serial0/0/1
      [120/1] via 172.29.3.1, 00:00:25, Serial0/0/0

```

El balanceo de carga son rutas redundantes.

- f. El router ISP solo debe indicar sus rutas estáticas adicionales a las directamente conectadas.

enable

config t

```
ip route 172.29.4.0 255.255.252.0 209.17.220.2
```

```
ip route 172.29.0.0 255.255.252.0 209.17.220.6
```

Rutas estáticas.

PARTE 3: DESHABILITAR LA PROPAGACIÓN DEL PROTOCOLO RIP.

- a. Para no propagar las publicaciones por interfaces que no lo requieran se debe deshabilitar la propagación del protocolo RIP, en la siguiente tabla se indican las interfaces de cada router que no necesitan desactivación.

ROUTER	INTERFAZ
Bogota1	SERIAL0/0/1; SERIAL0/1/0; SERIAL0/1/1
Bogota2	SERIAL0/0/0; SERIAL0/0/1
Bogota3	SERIAL0/0/0; SERIAL0/0/1; SERIAL0/1/0
Medellín1	SERIAL0/0/0; SERIAL0/0/1; SERIAL0/1/1
Medellín2	SERIAL0/0/0; SERIAL0/0/1
Medellín3	SERIAL0/0/0; SERIAL0/0/1; SERIAL0/1/0
ISP	No lo requiere

BOGOTA 1

```
Router>enable
```

```
Router#config t
```

```
Enter configuration commands, one per line. End with CNTL/Z.
```

```
Router(config)#interface s0/0/0
```

```
Router(config-if)#ip address 209.17.220.6 255.255.255.252
```

```
Router(config-if)#no shutdown
```

```
Router(config-if)#
```

```
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up
```

```
Router(config-if)#
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to up
```

```
Router(config-if)#interface s0/0/1
```

```
Router(config-if)#ip address 172.29.3.9 255.255.255.252
```

```
Router(config-if)#clock rate 4000000
Router(config-if)#no shutdown
%LINK-5-CHANGED: Interface Serial0/0/1, changed state to down
Router(config-if)#
Router(config-if)#interface s0/0/1
Router(config-if)#ip address 172.29.3.9 255.255.255.252
Router(config-if)#clock rate 4000000
Router(config-if)#no shutdown
Router(config-if)#
Router(config-if)#interface s0/1/0
Router(config-if)#ip address 172.29.3.1 255.255.255.252
Router(config-if)#clock rate 4000000
Router(config-if)#no shutdown
%LINK-5-CHANGED: Interface Serial0/1/0, changed state to down
Router(config-if)#
Router(config-if)#
Router(config-if)#interface s0/1/1
Router(config-if)#ip address 172.29.3.5 255.255.255.252
Router(config-if)#clock rate 4000000
Router(config-if)#no shutdown
%LINK-5-CHANGED: Interface Serial0/1/1, changed state to down
Router(config-if)#
Router(config-if)#
```

BOGOTA 2

```
Router>ENABLE
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface s0/0/0
Router(config-if)#ip address 172.29.3.10 255.255.255.252
Router(config-if)#no shutdown
```

```

Router(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up
Router(config-if)#interface s
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed
state to up
% Invalid input detected at '^' marker.
Router(config-if)#interface s0/0/1
Router(config-if)#no shutdown
%LINK-5-CHANGED: Interface Serial0/0/1, changed state to down
Router(config-if)#interface s0/0/1
Router(config-if)#ip address 172.29.3.13 255.255.255.252
Router(config-if)#clock rate 4000000
Router(config-if)#no shutdown
Router(config-if)#
Router(config-if)#interface g0/0
Router(config-if)#ip address 172.29.1.1 255.255.255.0
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0,
changed state to up
Router(config-if)#

```

BOGOTA 3

```

Router>enable
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface s0/0/0
Router(config-if)#ip address 172.29.3.2 255.255.255.252
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up

```

```
Router(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed
state to up
Router(config-if)#interface s0/0/1
Router(config-if)#ip address 172.29.3.6 255.255.255.252
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/1, changed state to up
Router(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/1, changed
state to up
Router(config-if)#interface g0/0
Router(config-if)#ip address 172.29.0.1 255.255.255.0
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0,
changed state to up
Router(config-if)#
```

MEDELLIN 1

```
Router>ENABLE
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface s0/0/0
Router(config-if)#ip address 209.17.220.2 255.255.255.252
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up
Router(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed
state to up
```

```
Router(config-if)#interface s0/0/1
Router(config-if)#ip address 172.29.6.1 255.255.255.252
Router(config-if)#clock rate 4000000
Router(config-if)#no shutdown
%LINK-5-CHANGED: Interface Serial0/0/1, changed state to down
Router(config-if)#interface s0/1/0
Router(config-if)#ip address 172.29.6.9 255.255.255.252
Router(config-if)#clock rate 4000000
Router(config-if)#no shutdown
%LINK-5-CHANGED: Interface Serial0/1/0, changed state to down
Router(config-if)#interface s0/1/1
Router(config-if)#ip address 172.29.6.13 255.255.255.252
Router(config-if)#clock rate 4000000
Router(config-if)#no shutdown
%LINK-5-CHANGED: Interface Serial0/1/1, changed state to down
Router(config-if)#
```

MEDELLIN 2

```
Router>enable
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface s0/0/0
Router(config-if)#ip address 172.29.6.2 255.255.255.252
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up
Router(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed
state to up
Router(config-if)#interface s0/0/1
Router(config-if)#ip address 172.29.6.5 255.255.255.252
```

```
Router(config-if)#clock rate 4000000
Router(config-if)#no shutdown
%LINK-5-CHANGED: Interface Serial0/0/1, changed state to down
Router(config-if)#
Router(config-if)#interface g0/0
Router(config-if)#ip address 172.29.4.1 255.255.255.128
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0,
changed state to up
Router(config-if)#
```

MEDELLIN 3

```
Router>enable
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface s0/0/0
Router(config-if)#ip address 172.29.6.10 255.255.255.252
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up
Router(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed
state to up
Router(config-if)#interface s0/0/1
Router(config-if)#ip address 172.29.6.14 255.255.255.252
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/1, changed state to up
Router(config-if)#
```

```

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/1, changed
state to up
Router(config-if)#interface s0/1/0
Router(config-if)#ip address 172.29.6.6 255.255.255.252
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface Serial0/1/0, changed state to up
Router(config-if)#interface
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1/0, changed
state to up
% Invalid input detected at '^' marker.
Router(config-if)#interface g0/0
Router(config-if)#ip address 172.29.4.129 255.255.255.128
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0,
changed state to up
Router(config-if)#

```

PARTE 4: VERIFICACIÓN DEL PROTOCOLO RIP.

- a. Verificar y documentar las opciones de enrutamiento configuradas en los routers, como el passive interface para la conexión hacia el ISP, la versión de RIP y las interfaces que participan de la publicación entre otros datos.

MEDELLIN 1 RIP

```

Router>enable
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router rip
Router(config-router)#version 2
Router(config-router)#no auto-summary
Router(config-router)#do show ip route connected

```



```
C 172.29.6.0/30 is directly connected, Serial0/0/1
C 172.29.6.8/30 is directly connected, Serial0/1/0
C 172.29.6.12/30 is directly connected, Serial0/1/1
C 209.17.220.0/30 is directly connected, Serial0/0/0
Router(config-router)#network 172.29.6.0
Router(config-router)#network 172.29.6.8
Router(config-router)#network 172.29.6.12
Router(config-router)#passi
% Invalid input detected at '^' marker.
Router(config-router)#passive-interface s0/0/0
Router(config-router)#
```

MEDELLIN 2 RIP

```
Router>enable
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router rip
Router(config-router)#version 2
Router(config-router)#no auto-summary
Router(config-router)#do show ip route connected
C 172.29.4.0/25 is directly connected, GigabitEthernet0/0
C 172.29.6.0/30 is directly connected, Serial0/0/0
C 172.29.6.4/30 is directly connected, Serial0/0/1
Router(config-router)#network 172.29.4.0
Router(config-router)#network 172.29.6.0
Router(config-router)#network 172.29.6.4
Router(config-router)#passive-interfaceg0/0
% Invalid input detected at '^' marker.
Router(config-router)#passive-interface g0/0
Router(config-router)#
```

MEDELLIN 3 RIP

Router>enable

Router#config t

Enter configuration commands, one per line. End with CNTL/Z.

Router(config)#router rip

Router(config-router)#version 2

Router(config-router)#no auto-summary

Router(config-router)#do show ip route connected

C 172.29.4.128/25 is directly connected, GigabitEthernet0/0

C 172.29.6.4/30 is directly connected, Serial0/1/0

C 172.29.6.8/30 is directly connected, Serial0/0/0

C 172.29.6.12/30 is directly connected, Serial0/0/1

Router(config-router)#network 172.29.4.128

Router(config-router)#network 172.29.6.4

Router(config-router)#network 172.29.6.8

Router(config-router)#network 172.29.6.12

Router(config-router)#passive-interface g0/0

Router(config-router)#

BOGOTA 1 RIP

Router>enable

Router#config t

Enter configuration commands, one per line. End with CNTL/Z.

Router(config)#router rip

Router(config-router)#version 2

Router(config-router)#no auto-summary

Router(config-router)#do show ip route cnneted

Translating "cnneted"...domain server (255.255.255.255)

% Invalid input detected

```
Router(config-router)#do show ip route conneted
Translating "conneted"...domain server (255.255.255.255)
% Invalid input detected
Router(config-router)#do show ip route connected
C 172.29.3.0/30 is directly connected, Serial0/1/0
C 172.29.3.4/30 is directly connected, Serial0/1/1
C 172.29.3.8/30 is directly connected, Serial0/0/1
C 209.17.220.4/30 is directly connected, Serial0/0/0
Router(config-router)#network 172.29.3.0
Router(config-router)#network 172.29.3.4
Router(config-router)#network 172.29.3.8
Router(config-router)#passive-interface s0/0/0
Router(config-router)#
```

BOGOTA 2 RIP

```
Router>enable
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router rip
Router(config-router)#version 2
Router(config-router)#no auto-summary
Router(config-router)#do show ip route connected
C 172.29.1.0/24 is directly connected, GigabitEthernet0/0
C 172.29.3.8/30 is directly connected, Serial0/0/0
C 172.29.3.12/30 is directly connected, Serial0/0/1
Router(config-router)#network 172.29.1.0
Router(config-router)#network 172.29.3.8
Router(config-router)#network 172.29.3.12
Router(config-router)#passive-interface g0/0
Router(config-router)#
```

BOGOTA 3 RIP

```
Router>enable
```

```
Router#config t
```

Enter configuration commands, one per line. End with CNTL/Z.

```
Router(config)#router rip
```

```
Router(config-router)#version 2
```

```
Router(config-router)#no auto-summary
```

```
Router(config-router)#do show ip route connected
```

```
C 172.29.0.0/24 is directly connected, GigabitEthernet0/0
```

```
C 172.29.3.0/30 is directly connected, Serial0/0/0
```

```
C 172.29.3.4/30 is directly connected, Serial0/0/1
```

```
C 172.29.3.12/30 is directly connected, Serial0/1/0
```

```
Router(config-router)#network 172.29.0.0
```

```
Router(config-router)#network 172.29.3.0
```

```
Router(config-router)#network 172.29.3.4
```

```
Router(config-router)#network 172.29.3.12
```

```
Router(config-router)#passive-interface g0/0
```

```
Router(config-router)#
```

```
Router(config-router)#
```

- b. Verificar y documentar la base de datos de RIP de cada router, donde se informa de manera detallada de todas las rutas hacia cada red.

MEDELLIN 1

```
Router(config)#router rip
```

```
Router(config-router)#version 2
```

```
Router(config-router)#no auto-summary
```

```
Router(config-router)#do show ip route connected
```

```
C 172.29.6.0/30 is directly connected, Serial0/0/1
```

```
C 172.29.6.8/30 is directly connected, Serial0/1/0
```

```
C 172.29.6.12/30 is directly connected, Serial0/1/1
C 209.17.220.0/30 is directly connected, Serial0/0/0
Router(config-router)#network 172.29.6.0
Router(config-router)#network 172.29.6.8
Router(config-router)#network 172.29.6.12
```

MEDELLIN 2

```
Router(config)#router rip
Router(config-router)#version 2
Router(config-router)#no auto-summary
Router(config-router)#do show ip route connected
C 172.29.4.0/25 is directly connected, GigabitEthernet0/0
C 172.29.6.0/30 is directly connected, Serial0/0/0
C 172.29.6.4/30 is directly connected, Serial0/0/1
Router(config-router)#network 172.29.4.0
Router(config-router)#network 172.29.6.0
Router(config-router)#network 172.29.6.4
```

MEDELLIN 3

```
Router(config)#router rip
Router(config-router)#version 2
Router(config-router)#no auto-summary
Router(config-router)#do show ip route connected
C 172.29.4.128/25 is directly connected, GigabitEthernet0/0
C 172.29.6.4/30 is directly connected, Serial0/1/0
C 172.29.6.8/30 is directly connected, Serial0/0/0
C 172.29.6.12/30 is directly connected, Serial0/0/1
Router(config-router)#network 172.29.4.128
Router(config-router)#network 172.29.6.4
Router(config-router)#network 172.29.6.8
Router(config-router)#network 172.29.6.12
```

```
Router(config-router)#passive-interface g0/0
```

BOGOTA 1

```
Router(config)#router rip
```

```
Router(config-router)#version 2
```

```
Router(config-router)#no auto-summary
```

```
Router(config-router)#do show ip route cnneted
```

```
Translating "cnneted"...domain server (255.255.255.255)
```

```
% Invalid input detected
```

```
Router(config-router)#do show ip route conneted
```

```
Translating "conneted"...domain server (255.255.255.255)
```

```
% Invalid input detected
```

```
Router(config-router)#do show ip route connected
```

```
C 172.29.3.0/30 is directly connected, Serial0/1/0
```

```
C 172.29.3.4/30 is directly connected, Serial0/1/1
```

```
C 172.29.3.8/30 is directly connected, Serial0/0/1
```

```
C 209.17.220.4/30 is directly connected, Serial0/0/0
```

```
Router(config-router)#network 172.29.3.0
```

```
Router(config-router)#network 172.29.3.4
```

```
Router(config-router)#network 172.29.3.8
```

```
Router(config-router)#passive-interface s0/0/0
```

BOGOTA 2

```
Router(config)#router rip
```

```
Router(config-router)#version 2
```

```
Router(config-router)#no auto-summary
```

```
Router(config-router)#do show ip route connected
```

```
C 172.29.1.0/24 is directly connected, GigabitEthernet0/0
```

```
C 172.29.3.8/30 is directly connected, Serial0/0/0
```

```
C 172.29.3.12/30 is directly connected, Serial0/0/1
```

```
Router(config-router)#network 172.29.1.0
```

```
Router(config-router)#network 172.29.3.8
Router(config-router)#network 172.29.3.12
Router(config-router)#passive-interface g0/0
```

BOGOTA 3

```
Router(config)#router rip
Router(config-router)#version 2
Router(config-router)#no auto-summary
Router(config-router)#do show ip route connected
C 172.29.0.0/24 is directly connected, GigabitEthernet0/0
C 172.29.3.0/30 is directly connected, Serial0/0/0
C 172.29.3.4/30 is directly connected, Serial0/0/1
C 172.29.3.12/30 is directly connected, Serial0/1/0
Router(config-router)#network 172.29.0.0
Router(config-router)#network 172.29.3.0
Router(config-router)#network 172.29.3.4
Router(config-router)#network 172.29.3.12
Router(config-router)#passive-interface g0/0
```

PARTE 5: CONFIGURAR ENCAPSULAMIENTO Y AUTENTICACIÓN PPP.

- Según la topología se requiere que el enlace Medellín1 con ISP sea configurado con autenticación PAP.

ISP

```
Router>enable
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname isp
isp(config)#username medellin 1 password edwin2019
% Invalid input detected at '^' marker.
isp(config)#username medellin1 password edwin2019
isp(config)#interface s0/0
```

```
%Invalid interface type and number
isp(config)#interface s0/0
%Invalid interface type and number
isp(config)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed
state to down
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed
state to up
isp(config)#interface s0/0/0
isp(config-if)#encapsulation ppp
isp(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed
state to down
isp(config-if)#ppp authentication pap
isp(config-if)#ppp pap sent-username isp password edwin2019
isp(config-if)#
```

MEDELLIN 1

```
Router>ENABLE
Router#CONFIG T
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname medellin1
medellin1(config)#username isp password edwin2019
medellin1(config)#interface s0/0/0
medellin1(config-if)#encapsulation PPP
medellin1(config-if)#ppp authentication pap
medellin1(config-if)#
medellin1(config-if)#ppp pap sent-username medellin1 password edwin2019
medellin1(config-if)#
medellin1(config-if)#
```


%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to up

- b. El enlace Bogotá1 con ISP se debe configurar con autenticación CHAT.

```
Router>enable
```

```
Router#config t
```

Enter configuration commands, one per line. End with CNTL/Z.

```
Router(config)#hostname bogota1
```

```
bogota1(config)#username isp password edwin2019
```

```
bogota1(config)#interface s0/0/0
```

```
bogota1(config-if)#encapsulation pp
```

```
bogota1(config-if)#
```

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to up

```
bogota1(config-if)#ppp authentication chap
```

```
bogota1(config-if)#
```

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to up

```
bogota1(config-if)#ppp authentication chap
```

```
bogota1(config-if)#
```

PARTE 6: CONFIGURACIÓN DE PAT.

- a. En la topología, si se activa NAT en cada equipo de salida (Bogotá1 y Medellín1), los routers internos de una ciudad no podrán llegar hasta los routers internos en el otro extremo, sólo existirá comunicación hasta los routers Bogotá1, ISP y Medellín1.

- b. Después de verificar lo indicado en el paso anterior proceda a configurar el NAT en el router Medellín1. Compruebe que la traducción de direcciones indique las interfaces de entrada y de salida. Al realizar una prueba de ping, la dirección debe ser traducida automáticamente a la dirección de la interfaz serial 0/1/0 del router Medellín1, como diferente puerto.
- c. Proceda a configurar el NAT en el router Bogotá1. Compruebe que la traducción de direcciones indique las interfaces de entrada y de salida. Al realizar una prueba de ping, la dirección debe ser traducida automáticamente a la dirección de la interfaz serial 0/1/0 del router Bogotá1, como diferente puerto.

PARTE 7: CONFIGURACIÓN DEL SERVICIO DHCP.

- a. Configurar la red Medellín2 y Medellín3 donde el router Medellín 2 debe ser el servidor DHCP para ambas redes Lan.

MEDELLIN 2

```
Router>enable
```

```
Router#config t
```

```
Enter configuration commands, one per line. End with CNTL/Z.
```

```
Router(config)#ip dhcp excluded-address 172.29.4.1 172.29.4.5
```

```
% Invalid input detected at '^' marker.
```

```
Router(config)#ip dhcp excluded-address 172.29.4.1 172.29.4.5
```

```
Router(config)##ip dhcp excluded-address 172.29.4.129 172.29.4.133
```

```
% Invalid input detected at '^' marker.
```

```
Router(config)#ip dhcp excluded-address 172.29.4.129 172.29.4.133
```

```
Router(config)#ip dhcp pool med2
```

```
% Invalid input detected at '^' marker.
```

```
Router(config)#ip dhcp pool medellin2
```

```
Router(dhcp-config)#
```

```
Router(dhcp-config)#network 172.29.4.0 255.255.255.128
```

```
^
```

```
% Invalid input detected at '^' marker.
```

```
Router(dhcp-config)#network 172.29.4.0 255.255.255.128
```

```
Router(dhcp-config)#default-router 172.29.4.1
Router(dhcp-config)#dns-server 8.8.8.8
Router(dhcp-config)#
Router(dhcp-config)#exit
Router(config)#
Router(config)#ip dhcp pool med3
Router(dhcp-config)#network 172.29.4.128 255.255.255.128
Router(dhcp-config)#default-router 172.29.4.129
Router(dhcp-config)#dns-server 8.8.8.8
Router(dhcp-config)#exit
Router(config)#
Router(config)#
```

MEDELLIN 3

```
Router>enable
Router#CONFIG T
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface g0/0
Router(config-if)#ip helper-address 172.29.6.5
Router(config-if)#
```

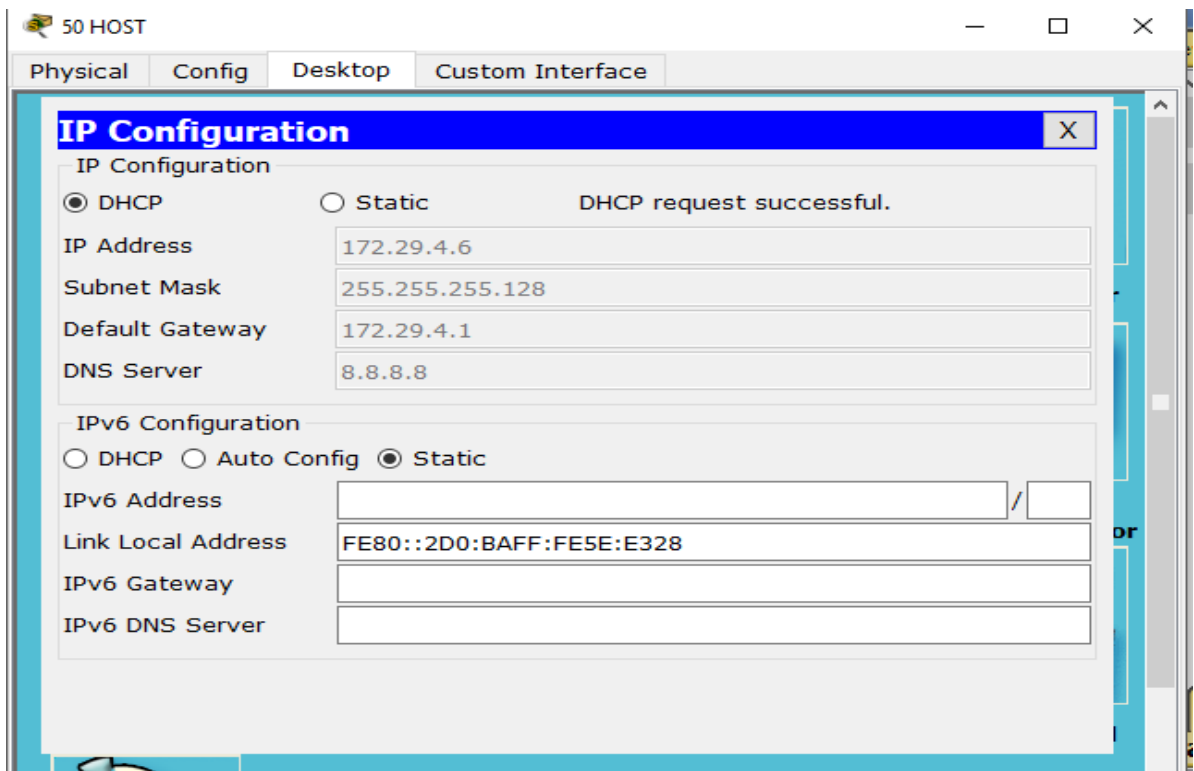


Ilustración 4 PC-0 50 HOST DHCP

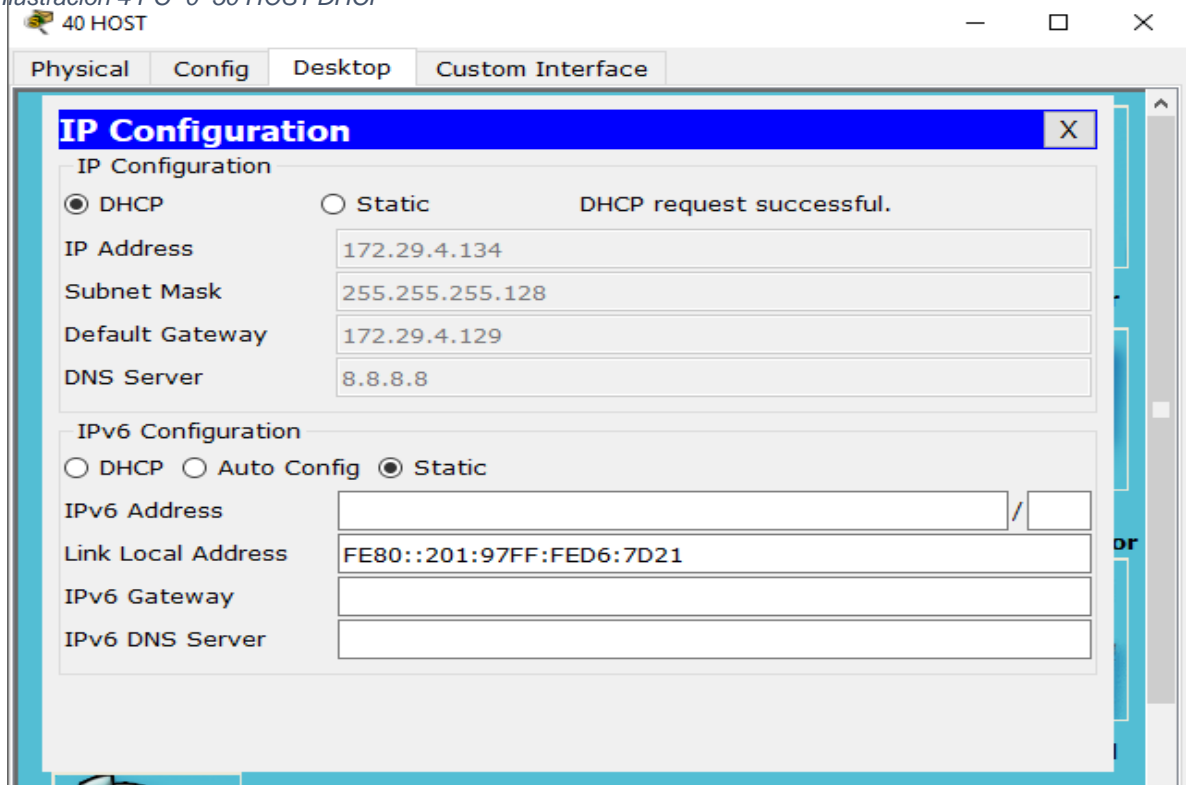


Ilustración 3 PC-1 40 HOST, DHCP

- b. El router Medellín3 deberá habilitar el paso de los mensajes broadcast hacia la IP del router Medellín2.
- c. Configurar la red Bogotá2 y Bogotá3 donde el router Medellín2 debe ser el servidor DHCP para ambas redes Lan.

BOGOTA 2

```
Router>enable
```

```
Router#config t
```

```
Enter configuration commands, one per line. End with CNTL/Z.
```

```
Router(config)#ip dhcp excluded-address 172.29.1.1 172.29.1.5
```

```
Router(config)#ip dhcp excluded-address 172.29.0.1 172.29.0.5
```

```
Router(config)#ip dhcp pool bogota2
```

```
Router(dhcp-config)#network 172.29.1.0 255.255.255.0
```

```
Router(dhcp-config)#default-router 172.29.1.1
```

```
Router(dhcp-config)#dns-server 8.8.8.8
```

```
Router(dhcp-config)#ip dhcp pool
```

```
bogota3
```

```
Router(dhcp-config)#network 172.29.0.0 255.255.255.0
```

```
Router(dhcp-config)#default-router 172.29.0.1
```

```
Router(dhcp-config)#dns-server 8.8.8.8
```

```
Router(dhcp-config)#
```

```
Router(dhcp-config)#
```

BOGOTA 3

```
Router>enable
```

```
Router#config t
```

```
Enter configuration commands, one per line. End with CNTL/Z.
```

```
Router(config)#interface g0/0
```

```
Router(config-if)#ip helper-address 172.29.3.13
```

```
Router(config-if)#
```

- d. Configure el router Bogotá1 para que habilite el paso de los mensajes Broadcast hacia la IP del router Bogotá2.

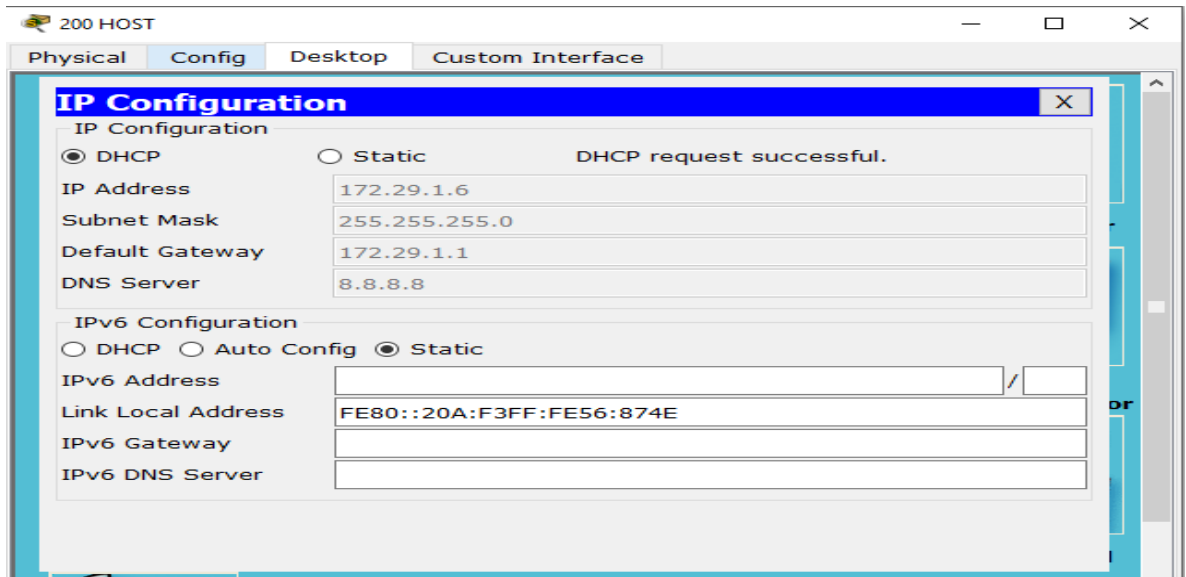


Ilustración 5 HOST 200 DHCP

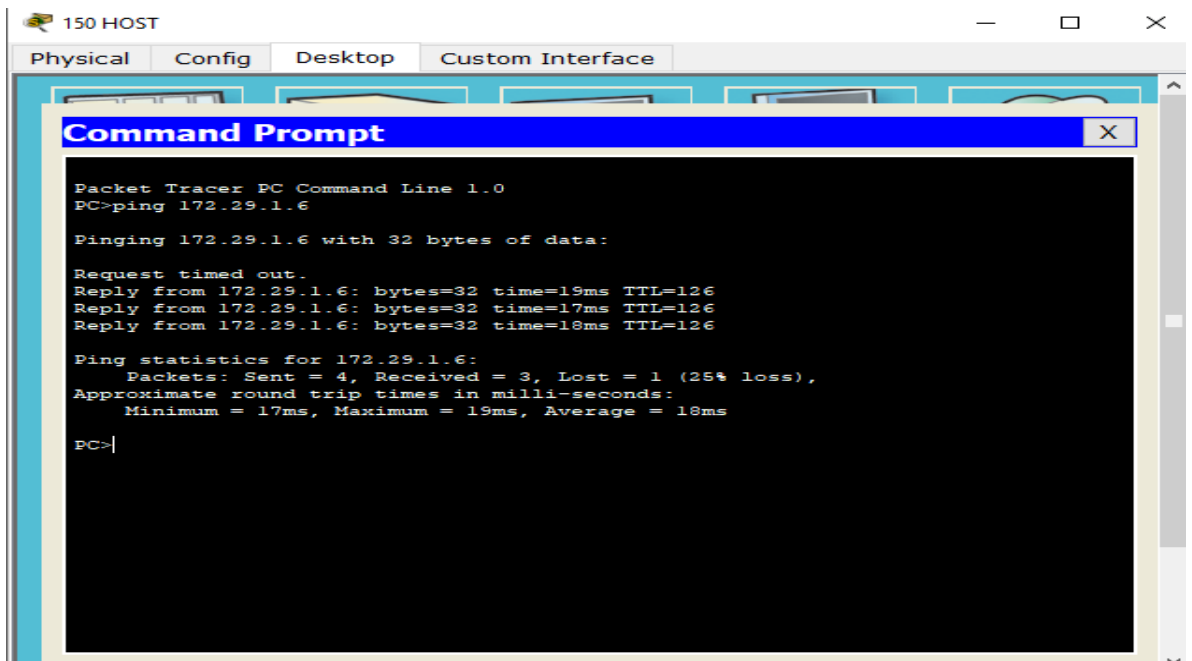


Ilustración 6 PING

ESCENARIO 2

Una empresa de Tecnología posee tres sucursales distribuidas en las ciudades de Miami, Bogotá y Buenos Aires, en donde el estudiante será el administrador de la red, el cual deberá configurar e interconectar entre sí cada uno de los dispositivos que forman parte del escenario, acorde con los lineamientos establecidos para el direccionamiento IP, protocolos de enrutamiento y demás aspectos que forman parte de la topología de red.

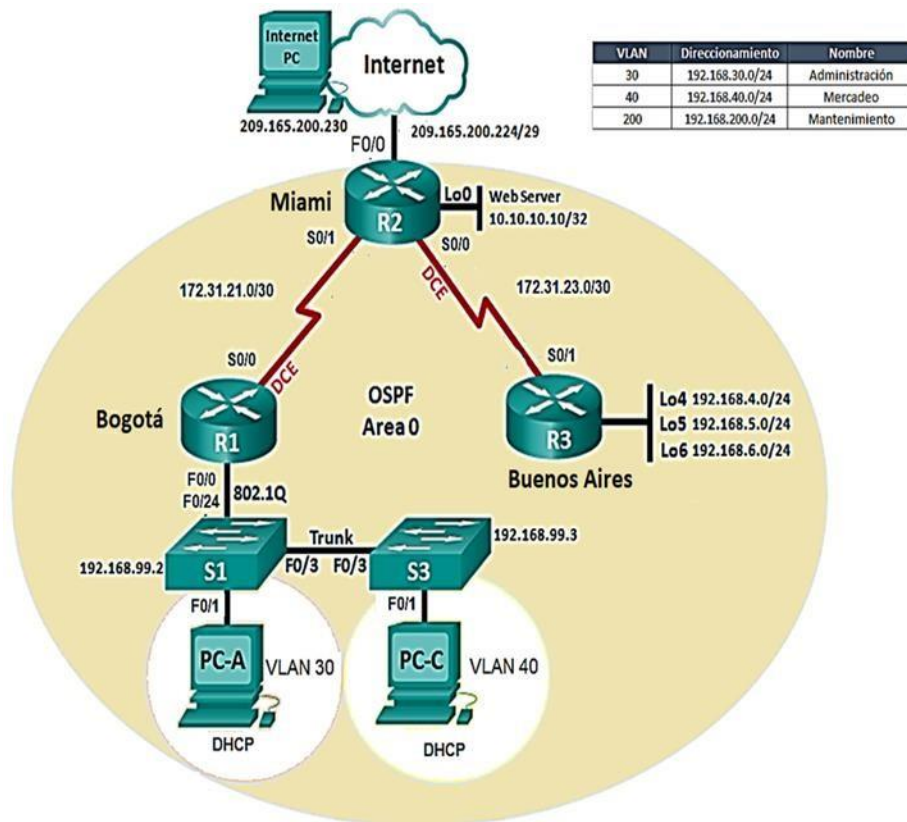


Ilustración 7 Topología a trabajar

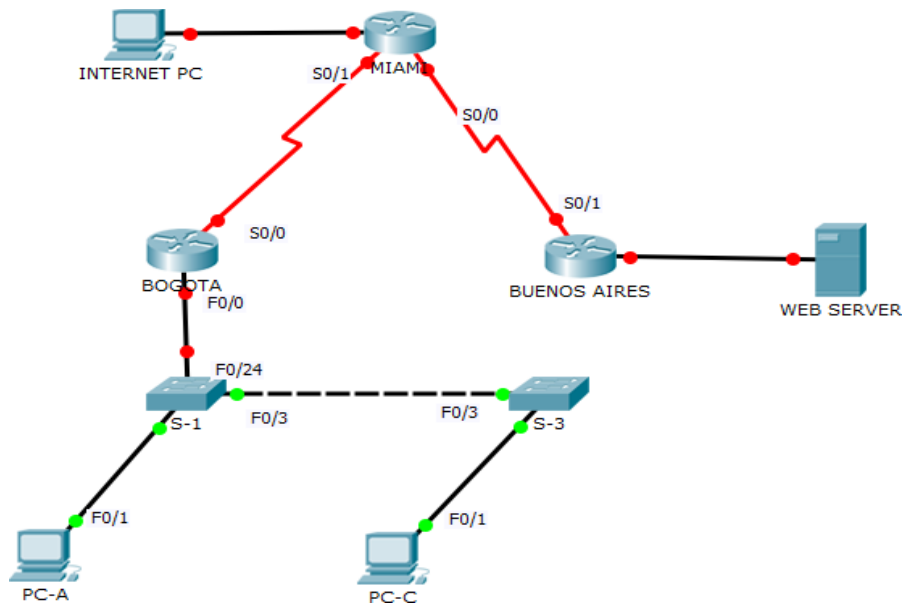


Ilustración 8 Tologia Packet tracer

CONFIGURAR EL DIRECCIONAMIENTO IP ACORDE CON LA TOPOLOGÍA DE RED PARA CADA UNO DE LOS DISPOSITIVOS QUE FORMAN PARTE DEL ESCENARIO

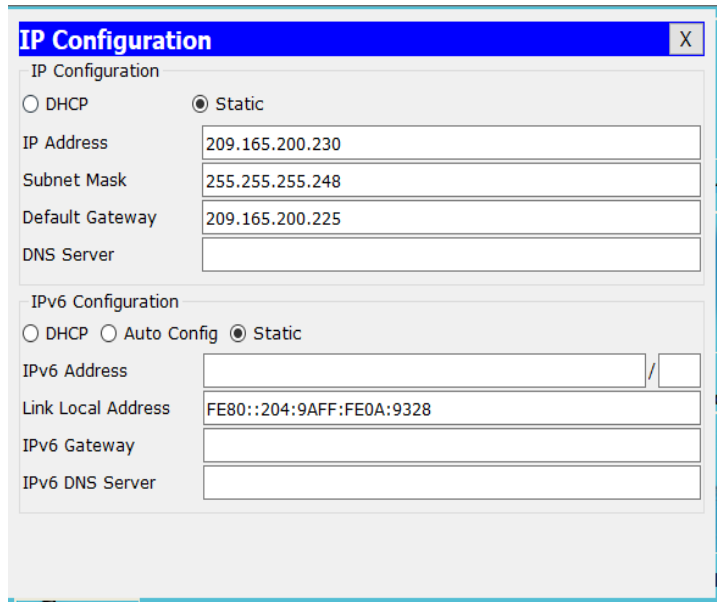


Ilustración 9 Configuración PC

Router R1 Bogotá

```
Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname bogota
bogota(config)#no ip domain lookup
bogota(config)#enable secret edwin2019
bogota(config)#line console 0
bogota(config-line)#password edwin
bogota(config-line)#login
bogota(config-line)#line vty 0 4
bogota(config-line)#password edwin2019
bogota(config-line)#login
bogota(config-line)#exit
bogota(config)#interface s0/0/0
```

```
bogota(config-if)#description conecta R2
% Invalid input detected at '^' marker.
bogota(config-if)#description conecta R2
bogota(config-if)#ip address 172.31.21.1 255.255.255.252
bogota(config-if)#clock rate 25600
Unknown clock rate
bogota(config-if)#clock rate
% Incomplete command.
bogota(config-if)#no shutdown
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to down
bogota(config-if)#ip route 0.0.0.0 0.0.0.0 s0/0/0
%Default route without gateway, if not a point-to-point interface, may impact
performance
bogota(config)#
```

Router R2 Miami

```
Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname miami
miami(config)#no ip domain lookup
miami(config)#enable secret edwin2019
miami(config)#line console 0
miami(config-line)#password edwin
miami(config-line)#login
miami(config-line)#line vty 0 4
miami(config-line)#password edwin2019
miami(config-line)#login
miami(config-line)#exit
miami(config)#interface s0/0/1
miami(config-if)#description conecta R1
% Invalid input detected at '^' marker.
miami(config-if)#description conecta R1
miami(config-if)#ip address 172.31.21.2 255.255.255.252
miami(config-if)#no shutdown
miami(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/1, changed state to up
miami(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/1, changed state
to up
miami(config-if)#
miami(config-if)#exit
miami(config)#interface s0/0/0
```

```

miami(config-if)#description conecta R3
% Invalid input detected at '^' marker.
miami(config-if)#description conecta R3
miami(config-if)#ip address 172.31.21.1 255.255.255.252
% 172.31.21.0 overlaps with Serial0/0/1
miami(config-if)#
miami(config-if)#clock rate 25600
Unknown clock rate
miami(config-if)#no shutdown
% 172.31.21.0 overlaps with Serial0/0/1
Serial0/0/0: incorrect IP address assignment
miami(config-if)#
miami(config-if)#exit
miami(config)#interface s0/0/1
miami(config-if)#description conecta R3
miami(config-if)#ip address 172.31.21.0 255.255.255.252
Bad mask /30 for address 172.31.21.0
miami(config-if)#clock rate 25600
Unknown clock rate
miami(config-if)#no shutdown
miami(config-if)#
miami(config-if)#interface g0/0
miami(config-if)#description conecta internet pc
miami(config-if)#ip address 209.165.200.230 255.255.255.248
miami(config-if)#no shutdown
miami(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0,
changed state to up
%IP-4-DUPADDR: Duplicate address 209.165.200.230 on GigabitEthernet0/0,
sourced by 00D0.58C9.2967
miami(config-if)#exit
miami(config)#
miami(config-if)#exit
miami(config)#
miami(config)#interface g0/0
miami(config-if)#10.10.10.10 255.255.255.0
% Invalid input detected at '^' marker.
miami(config-if)#ip address 10.10.10.10 255.255.255.0
miami(config-if)#no shutdown
miami(config-if)#
miami(config-if)#description web server
miami(config-if)#
miami(config-if)#exit
miami(config)#interface g0/0

```

```
miami(config-if)#ip address 10.10.10.1 255.255.255.0
miami(config-if)#no shutdown
miami(config-if)#
miami(config-if)#ip route 0.0.0.0 0.0.0.0 g0/1
%Default route without gateway, if not a point-to-point interface, may impact
performance
miami(config)#
miami(config)#
```

Router R3 Buenos Aires¹

```
Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname "buenos aires"
% Spaces are not allowed in hostname
Router(config)#no ip domain lookup
% Invalid input detected at '^' marker.
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#no ip domain lookup
Router(config)#enable secret edwin2019
Router(config)#line console 0
Router(config-line)#password edwin
Router(config-line)#login
Router(config-line)#line vty 0 4
Router(config-line)#password edwin2019
Router(config-line)#login
Router(config-line)#exit
Router(config)#interface s0/0/1
Router(config-if)#description conecta R2
Router(config-if)#ip address 172.31.23.2 255.255.255.252
Router(config-if)#no shutdown
%LINK-5-CHANGED: Interface Serial0/0/1, changed state to down
Router(config-if)#
Router(config-if)#
```

¹ La marcación no salió del Router cuando se la programaba como "buenos aires" quedo Router, no se corrige para no dañar el diseño del circuito o simulación en Packer Tracer..

Switche 1

```
S1>enable
S1#config t
Enter configuration commands, one per line. End with CNTL/Z.
S1(config)#no ip domain lookup
S1(config)#enable secret edwin2019
S1(config)#line console 0
S1(config-line)#password edwin
S1(config-line)#login
S1(config-line)#line vty 0 4
S1(config-line)#password edwin2019
S1(config-line)#login
S1(config-line)#exit
S1(config)#
S1(config)#
```

Switch 3

```
S3>enable
S3#config t
Enter configuration commands, one per line. End with CNTL/Z.
S3(config)#no ip domain lookup
S3(config)#enable secret edwin2019
S3(config)#line console 0
S3(config-line)#password edwin
S3(config-line)#login
S3(config-line)#line vty 0 4
S3(config-line)#password edwin2019
S3(config-line)#login
S3(config-line)#exit
S3(config)#show vlan
% Invalid input detected at '^' marker.
S3(config)#interface vlan 200
S3(config-if)#
%LINK-5-CHANGED: Interface Vlan200, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan200, changed state to
up
S3(config-if)#ip address 192.168. 200 3 255.255.255.0
% Invalid input detected at '^' marker.
S3(config-if)#ip address 192.168.200.3 255.255.255.0
S3(config-if)#no shutdown
S3(config-if)#ip defaut gateway 192.168.200.1
% Invalid input detected at '^' marker.
```

```
S3(config-if)#ip default-gateway 192.168.200.1
S3(config)#interface fa0/3
S3(config-if)#switchport mode trunk
S3(config-if)#switchport trunk native vlan 1
S3(config-if)#interface range fa0/2,fa0/4-24, g0/1-2
S3(config-if-range)#switchport mode access
S3(config-if-range)#exit
S3(config)#int fa0/1
S3(config-if)#switchport mode access
S3(config-if)#switchport access vlan 40
S3(config-if)#interface range fa0/2, fa0/4-24, g0/1-2
S3(config-if-range)#shutdown
%LINK-5-CHANGED: Interface FastEthernet0/2, changed state to administratively
down
%LINK-5-CHANGED: Interface FastEthernet0/4, changed state to administratively
down
%LINK-5-CHANGED: Interface FastEthernet0/5, changed state to administratively
down
%LINK-5-CHANGED: Interface FastEthernet0/6, changed state to administratively
down
%LINK-5-CHANGED: Interface FastEthernet0/7, changed state to administratively
down
%LINK-5-CHANGED: Interface FastEthernet0/8, changed state to administratively
down
%LINK-5-CHANGED: Interface FastEthernet0/9, changed state to administratively
down
%LINK-5-CHANGED: Interface FastEthernet0/10, changed state to
administratively down
%LINK-5-CHANGED: Interface FastEthernet0/11, changed state to
administratively down
%LINK-5-CHANGED: Interface FastEthernet0/12, changed state to
administratively down
%LINK-5-CHANGED: Interface FastEthernet0/13, changed state to
administratively down

%LINK-5-CHANGED: Interface FastEthernet0/14, changed state to
administratively down
%LINK-5-CHANGED: Interface FastEthernet0/15, changed state to
administratively down
%LINK-5-CHANGED: Interface FastEthernet0/16, changed state to
administratively down
%LINK-5-CHANGED: Interface FastEthernet0/17, changed state to
administratively down
%LINK-5-CHANGED: Interface FastEthernet0/18, changed state to
administratively down
```

```
%LINK-5-CHANGED: Interface FastEthernet0/19, changed state to
administratively down
%LINK-5-CHANGED: Interface FastEthernet0/20, changed state to
administratively down
%LINK-5-CHANGED: Interface FastEthernet0/21, changed state to
administratively down
%LINK-5-CHANGED: Interface FastEthernet0/22, changed state to
administratively down
%LINK-5-CHANGED: Interface FastEthernet0/23, changed state to
administratively down
%LINK-5-CHANGED: Interface FastEthernet0/24, changed state to
administratively down
%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to
administratively down
%LINK-5-CHANGED: Interface GigabitEthernet0/2, changed state to
administratively down
S3(config-if-range)#
```

Trunk

```
S1#config
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
S1(config)#interface f0/3
S1(config-if)#switchport mode trunk
S1(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3, changed
state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3, changed
state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan200, changed state to
up
S1(config-if)#swtchport trunk native vlan 1
% Invalid input detected at '^' marker.
S1(config-if)#switchport trunk native vlan 1
S1(config-if)#exit
S1(config)#interface f0/24
S1(config-if)#switchport mode trunk
S1(config-if)#switchport trunk native vlan 1
S1(config-if)#exit
S1(config)#
```

Ping En S3

```
S3>ping 192.160.200.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.160.200.1, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)
S3>ping 192.168.40.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.40.1, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)
S3>
```

Configuración interface R1

```
bogota>enable
Password:
bogota#config
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
bogota(config)#interface g0/0.30
bogota(config-subif)#description administracion LAN
bogota(config-subif)#encapsulation dot1q 30
bogota(config-subif)#ip address 192.168.30.1 255.255.255.0
bogota(config-subif)#no shutdown
bogota(config-subif)#interface g0/0.40
bogota(config-subif)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0.40, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0.40,
changed state to up
bogota(config-subif)#description mercadeo LAN
bogota(config-subif)#encapsulation dot1q 40
bogota(config-subif)#ip address 192.168.40.1 255.255.255.0
bogota(config-subif)#no shutdown
bogota(config-subif)#interface g0/0.200
bogota(config-subif)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0.200, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0.200,
changed state to up
bogota(config-subif)#description mantenimiento LAN
```



```

bogota(config-subif)#encapsulation dot1q 200
bogota(config-subif)#ip address 192.168.200.1 255.255.255.0
bogota(config-subif)#exit
bogota(config)#interface g0/0
bogota(config-if)#no shutdown
bogota(config-if)#

```

CONFIGURAR EL PROTOCOLO DE ENRUTAMIENTO OSPFV2 BAJO LOS SIGUIENTES CRITERIOS:

OSPFv2 area 0

Verificar información de OSPF

Configuration Item or Task	Specification
Router ID R1	1.1.1.1
Router ID R2	5.5.5.5
Router ID R3	8.8.8.8
Configurar todas las interfaces LAN como pasivas	
Establecer el ancho de banda para enlaces seriales en	256 Kb/s
Ajustar el costo en la métrica de S0/0 a	9500

Visualizar tablas de enrutamiento y router conectados por OSPFv2

Configuración en R1

bogota#show ip route connected

```

C 172.31.21.0/30 is directly connected, Serial0/0/0
C 192.168.30.0/24 is directly connected, GigabitEthernet0/0.30
C 192.168.40.0/24 is directly connected, GigabitEthernet0/0.40
C 192.168.200.0/24 is directly connected, GigabitEthernet0/0.200
bogota#config
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
bogota(config)#router ospf 1
bogota(config-router)#router-id 1.1.1.1
bogota(config-router)#network 172.31.21.0.0.0.3 area 0

```

```
% Invalid input detected at '^' marker.
bogota(config-router)#network 172.31.21.0 0.0.0.3 area 0
bogota(config-router)#network 192.168.30.0 0.0.0.255 area 0
bogota(config-router)#network 192.168.40.0 0.0.0.255 area 0
bogota(config-router)#network 192.168.200.0 0.0.0.255 area 0
bogota(config-router)#
bogota(config-router)#passive-interface g0/0.30
bogota(config-router)#passive-interface g0/0.40
bogota(config-router)#passive-interface g0/0.200
bogota(config-router)#
bogota(config-router)#
```

Configuración en R2

User Access Verification

Password:

```
miami>config
```

```
Translating "config"
```

```
% Unknown command or computer name, or unable to find computer address
```

```
miami>routerospf 1
```

```
% Invalid input detected at '^' marker.
```

```
miami>enable
```

Password:

```
miami#config
```

```
Configuring from terminal, memory, or network [terminal]?
```

```
Enter configuration commands, one per line. End with CNTL/Z.
```

```
miami(config)#router ospf 1
```

```
miami(config-router)#router-id 5.5.5.5
```

```
miami(config-router)#network 172.31.21.0 0.0.0.3 area 0
```

```
miami(config-router)#
```

```
00:57:12: %OSPF-5-ADJCHG: Process 1, Nbr 1.1.1.1 on Serial0/0/1 from
LOADING to FULL, Loading Done
```

```
miami(config-router)#network 172.31.23.0 0.0.0.3 area 0
```

```
miami(config-router)#network 10.10.10.0 0.0.0.255 area 0
```

```
miami(config-router)#
```

```
miami(config-router)#passive-interface g0/0
```

```
miami(config-router)#interface s0/0/0
```

```
miami(config-if)#bandwidth 256
```

```
miami(config-if)#interface s0/0/1
```

```
miami(config-if)#bandwidth 256
```

```
miami(config-if)#interface s0/0/0
```

```
miami(config-if)#ip ospf cost 9500
```

```
miami(config-if)#
```

```
miami(config-if)#
```

Configuración en R3

```
User Access Verification
Password:
Router>enable
Password:
Router#router ospf 1
% Invalid input detected at '^' marker.
Router#config
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router ospf 1
Router(config-router)#router-id 8.8.8.8
Router(config-router)#network 172.31.23.0 0.0.0.3 area 0
Router(config-router)#network 192.168.4.0 0.0.3.255 area 0
Router(config-router)#interface s0/0/1
Router(config-if)#bandwidth cost 9500
% Invalid input detected at '^' marker.
Router(config-if)#passive-interface 1o4
% Invalid input detected at '^' marker.
Router(config-if)#exit
Router(config)#
```

Visualizar lista resumida de interfaces por OSPF en donde se ilustre el costo de cada interface

Router 2

```
miami#show ip ospf interface
GigabitEthernet0/0 is up, line protocol is up
Internet address is 10.10.10.1/24, Area 0
Process ID 1, Router ID 5.5.5.5, Network Type BROADCAST, Cost: 1
Transmit Delay is 1 sec, State DR, Priority 1
Designated Router (ID) 5.5.5.5, Interface address 10.10.10.1
No backup designated router on this network
Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
No Hellos (Passive interface)
Index 1/1, flood queue length 0
Next 0x0(0)/0x0(0)
Last flood scan length is 1, maximum is 1
Last flood scan time is 0 msec, maximum is 0 msec
Neighbor Count is 0, Adjacent neighbor count is 0
```

```
Suppress hello for 0 neighbor(s)
Serial0/0/1 is up, line protocol is up
Internet address is 172.31.21.2/30, Area 0
Process ID 1, Router ID 5.5.5.5, Network Type POINT-TO-POINT, Cost: 390
Transmit Delay is 1 sec, State POINT-TO-POINT, Priority 0
No designated router on this network
No backup designated router on this network
Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
Hello due in 00:00:07
Index 2/2, flood queue length 0
Next 0x0(0)/0x0(0)
Last flood scan length is 1, maximum is 1
Last flood scan time is 0 msec, maximum is 0 msec
Neighbor Count is 1 , Adjacent neighbor count is 1
Adjacent with neighbor 1.1.1.1
Suppress hello for 0 neighbor(s)
miami#
miami#
```

Router 3

```
Router(config-router)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
Router#show ip ospf interface
Loopback4 is up, line protocol is up
Internet address is 192.168.4.1/24, Area 0
Process ID 1, Router ID 8.8.8.8, Network Type LOOPBACK, Cost: 1
Loopback interface is treated as a stub Host
Loopback5 is up, line protocol is up
Internet address is 192.168.5.1/24, Area 0
Process ID 1, Router ID 8.8.8.8, Network Type LOOPBACK, Cost: 1
Loopback interface is treated as a stub Host
Loopback6 is up, line protocol is up
Internet address is 192.168.6.1/24, Area 0
Process ID 1, Router ID 8.8.8.8, Network Type LOOPBACK, Cost: 1
Loopback interface is treated as a stub Host
Router#
Router#
```

Visualizar el OSPF Process ID, Router ID, Address summarizations, Routing Networks, and passive interfaces configuradas en cada router.

Router R1

bogota>enable

Password:

bogota#show ip ospf interface

GigabitEthernet0/0.30 is up, line protocol is up

Internet address is 192.168.30.1/24, Area 0

Process ID 1, Router ID 1.1.1.1, Network Type BROADCAST, Cost: 1

Transmit Delay is 1 sec, State DR, Priority 1

Designated Router (ID) 1.1.1.1, Interface address 192.168.30.1

No backup designated router on this network

Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5

No Hellos (Passive interface)

Index 1/1, flood queue length 0

Next 0x0(0)/0x0(0)

Last flood scan length is 1, maximum is 1

Last flood scan time is 0 msec, maximum is 0 msec

Neighbor Count is 0, Adjacent neighbor count is 0

Suppress hello for 0 neighbor(s)

GigabitEthernet0/0.40 is up, line protocol is up

Internet address is 192.168.40.1/24, Area 0

Process ID 1, Router ID 1.1.1.1, Network Type BROADCAST, Cost: 1

Transmit Delay is 1 sec, State DR, Priority 1

Designated Router (ID) 1.1.1.1, Interface address 192.168.40.1

No backup designated router on this network

Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5

No Hellos (Passive interface)

Index 2/2, flood queue length 0

Next 0x0(0)/0x0(0)

Last flood scan length is 1, maximum is 1

Last flood scan time is 0 msec, maximum is 0 msec

Neighbor Count is 0, Adjacent neighbor count is 0

Suppress hello for 0 neighbor(s)

GigabitEthernet0/0.200 is up, line protocol is up

Internet address is 192.168.200.1/24, Area 0

Process ID 1, Router ID 1.1.1.1, Network Type BROADCAST, Cost: 1

Transmit Delay is 1 sec, State DR, Priority 1

Designated Router (ID) 1.1.1.1, Interface address 192.168.200.1

No backup designated router on this network

Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5

No Hellos (Passive interface)

Index 3/3, flood queue length 0

Next 0x0(0)/0x0(0)

Last flood scan length is 1, maximum is 1

```
Last flood scan time is 0 msec, maximum is 0 msec
Neighbor Count is 0, Adjacent neighbor count is 0
Suppress hello for 0 neighbor(s)
Serial0/0/0 is up, line protocol is up
Internet address is 172.31.21.1/30, Area 0
Process ID 1, Router ID 1.1.1.1, Network Type POINT-TO-POINT, Cost: 64
Transmit Delay is 1 sec, State POINT-TO-POINT, Priority 0
No designated router on this network
No backup designated router on this network
Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
Hello due in 00:00:04
Index 4/4, flood queue length 0
Next 0x0(0)/0x0(0)
Last flood scan length is 1, maximum is 1
Last flood scan time is 0 msec, maximum is 0 msec
Neighbor Count is 1 , Adjacent neighbor count is 1
Adjacent with neighbor 5.5.5.5
Suppress hello for 0 neighbor(s)
bogota#
bogota#
```

Router 2

```
miami>enable
Password:
miami#show ip ospf interface
GigabitEthernet0/0 is up, line protocol is up
Internet address is 10.10.10.1/24, Area 0
Process ID 1, Router ID 5.5.5.5, Network Type BROADCAST, Cost: 1
Transmit Delay is 1 sec, State DR, Priority 1
Designated Router (ID) 5.5.5.5, Interface address 10.10.10.1
No backup designated router on this network
Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
No Hellos (Passive interface)
Index 1/1, flood queue length 0
Next 0x0(0)/0x0(0)
Last flood scan length is 1, maximum is 1
Last flood scan time is 0 msec, maximum is 0 msec
Neighbor Count is 0, Adjacent neighbor count is 0
Suppress hello for 0 neighbor(s)
Serial0/0/1 is up, line protocol is up
Internet address is 172.31.21.2/30, Area 0
Process ID 1, Router ID 5.5.5.5, Network Type POINT-TO-POINT, Cost: 390
```

```
Transmit Delay is 1 sec, State POINT-TO-POINT, Priority 0
No designated router on this network
No backup designated router on this network
Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
Hello due in 00:00:01
Index 2/2, flood queue length 0
Next 0x0(0)/0x0(0)
Last flood scan length is 1, maximum is 1
Last flood scan time is 0 msec, maximum is 0 msec
Neighbor Count is 1 , Adjacent neighbor count is 1
Adjacent with neighbor 1.1.1.1
Suppress hello for 0 neighbor(s)
miami#
miami#
```

Router 3

```
Router>enable
Password:
Router#show ip ospf interface
Loopback4 is up, line protocol is up
Internet address is 192.168.4.1/24, Area 0
Process ID 1, Router ID 8.8.8.8, Network Type LOOPBACK, Cost: 1
Loopback interface is treated as a stub Host
Loopback5 is up, line protocol is up
Internet address is 192.168.5.1/24, Area 0
Process ID 1, Router ID 8.8.8.8, Network Type LOOPBACK, Cost: 1
Loopback interface is treated as a stub Host
Loopback6 is up, line protocol is up
Internet address is 192.168.6.1/24, Area 0
Process ID 1, Router ID 8.8.8.8, Network Type LOOPBACK, Cost: 1
Loopback interface is treated as a stub Host
Router#
```

CONFIGURAR VLANS, PUERTOS TRONCALES, PUERTOS DE ACCESO, ENCAPSULAMIENTO, INTERVLAN ROUTING Y SEGURIDAD EN LOS SWITCHES ACORDE A LA TOPOLOGÍA DE RED ESTABLECIDA.

SWITCHE S1

S1#config t

Enter configuration commands, one per line. End with CNTL/Z.

S1(config)#

S1(config)#vlan 30

S1(config-vlan)#name administracion

S1(config-vlan)#exit

S1(config)#vlan 40

S1(config-vlan)#name mercadeo

S1(config-vlan)#exit

S1(config)#vlan 200

S1(config-vlan)#name mantenimiento

S1(config-vlan)#exit

S1(config)#interface vlan 200

S1(config-if)#ip address 192.168.99.2 255.255.255.0

S1(config-if)#no shutdown

S1(config-if)#exit

S1(config)#default-gateway 192.168.99.1

% Invalid input detected at '^' marker.

S1(config)#ip default-gateway 192.168.99.1

S1(config)#

S1(config)#

S1>enable

Password:

S1#config

Configuring from terminal, memory, or network [terminal]?

Enter configuration commands, one per line. End with CNTL/Z.

S1(config)#interface fastethernet 0/3

S1(config-if)#switchport mode trunk

S1(config-if)#

S1(config-if)#

S1(config-if)#

S1(config-if)#switchport trunk native 0/24

% Invalid input detected at '^' marker.

S1(config-if)#switchport trunk native vlan 1

S1(config-if)#exit

S1(config)#interface fastEthernet o/24

% Invalid input detected at '^' marker.


```
S1(config)#interface fastEthernet 0/24
S1(config-if)#exit
S1(config)#interface fastEthernet 0/24
S1(config-if)#switchport mode trunk
S1(config-if)#switchport trunk native vlan 1
S1(config-if)#exit
S1(config)#
```

SWITCHE S3

S3>enable

Password:

S3#

S3#config t

Enter configuration commands, one per line. End with CNTL/Z.

S3(config)#vlan 30

S3(config-vlan)#name Administracion

S3(config-vlan)#vlan 40

S3(config-vlan)#name Mercadeo

S3(config-vlan)#vlan 200

S3(config-vlan)#name Mantenimiento

S3(config-vlan)#VLAN Mantenimiento

^

% Invalid input detected at '^' marker.

S3(config-vlan)#exit

S3(config)#interface vlan 200

S3(config-if)#

S3(config-if)#ip address 192.168.99.3 255.255.255.0

S3(config-if)#Puerto de enlace S3 VLAN Mantenimiento

^

% Invalid input detected at '^' marker.

S3(config-if)#exit

S3(config)#ip default-gateway 192.168.99.1

S3(config)#int F0/3

S3(config-if)#switchport mode trunk

S3(config-if)#switchport trunk native vlan 1

S3(config-if)#int range fa0/1-2, fa0/4-24, g0/1-2

S3(config-if-range)#switchport mode access

S3(config-if-range)#int f0/1

S3(config-if)#switchport mode access

S3(config-if)#switchport access vlan 40

S3(config-if)#int range fa0/2, fa0/4-24, g0/1-2

S3(config-if-range)#switchport

% Incomplete command.

```
S3(config-if-range)#switchport mode trunk
S3(config-if-range)#switchport trunk native 0/24
^
% Invalid input detected at '^' marker.
S3(config-if-range)#exit
S3(config)#
```

EN EL SWITCH 3 DESHABILITAR DNS LOOKUP.

```
S3#enable
S3#config t
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
S3(config)#no ip domain lookup
S3(config)#exit
S3#
%SYS-5-CONFIG_I: Configured from console by console
S3#
```

ASIGNAR DIRECCIONES IP A LOS SWITCHES ACORDE A LOS LINEAMIENTOS.

SWITCHE S1

```
S1>enable
Password:
S1#config t
Enter configuration commands, one per line. End with CNTL/Z.
S1(config)#interface f0/0
%Invalid interface type and number
S1(config)#int
% Incomplete command.
S1(config)#int F0/3
S1(config-if)#int f0/4
S1(config-if)#int f0/1
S1(config-if)#int f0/2
S1(config-if)#switchport trunk native vlan 1
S1(config-if)#exit
S1(config)#int fastEthernet 0/24
S1(config-if)#switchport mode trunk
S1(config-if)#switchport trunk native vlan 1
S1(config-if)#exit
```

```
S1(config)#int vlan 200
S1(config-if)#ip address 192.168.200.2 255.255.255.0
S1(config-if)#no shutdown
S1(config-if)#exit
S1(config)#
```

DESACTIVAR TODAS LAS INTERFACES QUE NO SEAN UTILIZADAS EN EL ESQUEMA DE RED.

SWITCHE S1

```
S1>enable
Password:
S1#config t
Enter configuration commands, one per line. End with CNTL/Z.
S1(config)#interface range fa0/1-2, fa0/4-23, GigabitEthernet0/1-2
S1(config-if-range)#switchport mode access
S1(config-if-range)#interface fa0/1
S1(config-if)#switchport access vlan 30
S1(config-if)#interface range fa0/2, fa0/4-23, GigabitEthernet0/1-2
S1(config-if-range)#shutdown
S1(config-if-range)#exit
S1(config)#
S1(config)#
```

SWITCHE S3

```
User Access Verification
Password:
S3>enable
Password:
S3#config t
Enter configuration commands, one per line. End with CNTL/Z.
S3(config)#interface range fa0/1-2, fa0/4-24, GigabitEthernet0/1-2
S3(config-if-range)#switchport mode access
S3(config-if-range)#interface fa0/1
S3(config-if)#switchport mode access
S3(config-if)#switchport access vlan 40
S3(config-if)#interface range fa0/2, fa0/4-24, GigabitEthernet0/1-2
```

```
S3(config-if-range)#shutdown
S3(config-if-range)#exit
S3(config)#
S3(config)#
```

IMPLEMENTE DHCP AND NAT FOR IPV4, CONFIGURAR R1 COMO SERVIDOR DHCP PARA LAS VLANS 30 Y 40.

User Access Verification

Password:

bogota>enable

Password:

bogota#config t

Enter configuration commands, one per line. End with CNTL/Z.

bogota(config)#ip dhcp excluded-address 192.168.30.1 192.168.30.30

bogota(config)#ip dhcp excluded-address 192.168.40.1 192.169.40.30

bogota(config)#ip dhcp pool administracion

bogota(dhcp-config)#dns-server 10.10.10.11

bogota(dhcp-config)#default-router 192.168.30.1

bogota(dhcp-config)#network 192.168.30.0 255.255.255.0

bogota(dhcp-config)#ip dhcp pool mercadeo

bogota(dhcp-config)#dns-server 10.10.10.11

bogota(dhcp-config)#default-router 192.168.40.1

bogota(dhcp-config)#network 192.168.40.0 255.255.255.0

bogota(dhcp-config)#exit

bogota(config)#exit

bogota#

%SYS-5-CONFIG_I: Configured from console by console

bogota#

RESERVAR LAS PRIMERAS 30 DIRECCIONES IP DE LAS VLAN 30 Y 40 PARA CONFIGURACIONES ESTÁTICAS.

Configurar DHCP pool para VLAN 30	Name: ADMINISTRACION DNS-Server: 10.10.10.11 Domain-Name: ccna-unad.com Establecer default gateway.
Configurar DHCP pool para VLAN 40	Name: MERCADEO DNS-Server: 10.10.10.11 Domain-Name: ccna-unad.com Establecer default gateway.

CONFIGURAR NAT EN R2 PARA PERMITIR QUE LOS HOST PUEDAN SALIR A INTERNET.

```
miami#config t
Enter configuration commands, one per line. End with CNTL/Z.
miami(config)#user webuser privilege 15 secret edwin2019
miami(config)#ip nat inside source static 10.10.10.10 209.165.200.229
miami(config)#interface g0/1
miami(config-if)#ip nat outside
miami(config-if)#interface g0/0
miami(config-if)#ip nat inside
miami(config-if)#exit
```

CONFIGURAR AL MENOS DOS LISTAS DE ACCESO DE TIPO ESTÁNDAR A SU CRITERIO EN PARA RESTRINGIR O PERMITIR TRÁFICO DESDE R1 O R3 HACIA R2.

CONFIGURAR AL MENOS DOS LISTAS DE ACCESO DE TIPO EXTENDIDO O NOMBRADAS A SU CRITERIO EN PARA RESTRINGIR O PERMITIR TRÁFICO DESDE R1 O R3 HACIA R2.

User Access Verification

Password:

```
miami>enable
```

Password:

```
miami#config t
```

Enter configuration commands, one per line. End with CNTL/Z.

```
miami(config)#user webuser privilege 15 secret edwin2019
miami(config)#ip nat inside source static 10.10.10.10 209.165.200.229
miami(config)#interface g0/1
miami(config-if)#ip nat outside
miami(config-if)#interface g0/0
miami(config-if)#ip nat inside
miami(config-if)#exit
miami(config)#access-list 1 permit 192.168.30.0 0.0.0.255
miami(config)#access-list 1 permit 192.168.40.0 0.0.0.255
miami(config)#access-list 1 permit 192.168.4.0 0.0.3.255
miami(config)#ip nat pool internet 209.165.200.225 209.165.200.228 netmask
255.255.255.248
miami(config)#ip nat inside source list 1 pool internet
miami(config)#
miami(config)#
```

VERIFICAR PROCESOS DE COMUNICACIÓN Y REDIRECCIONAMIENTO DE TRÁFICO EN LOS ROUTERS MEDIANTE EL USO DE PING Y TRACEROUTE.

Command Prompt

```
Packet Tracer PC Command Line 1.0
PC>ping 192.168.30.31

Pinging 192.168.30.31 with 32 bytes of data:

Reply from 192.168.30.31: bytes=32 time=40ms TTL=128
Reply from 192.168.30.31: bytes=32 time=2ms TTL=128
Reply from 192.168.30.31: bytes=32 time=34ms TTL=128
Reply from 192.168.30.31: bytes=32 time=36ms TTL=128

Ping statistics for 192.168.30.31:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 2ms, Maximum = 40ms, Average = 28ms
```

```
PC>ping 209.165.200.230

Pinging 209.165.200.230 with 32 bytes of data:

Reply from 172.31.21.2: Destination host unreachable.
Reply from 172.31.21.2: Destination host unreachable.
Reply from 172.31.21.2: Destination host unreachable.
Reply from 172.31.21.2: Destination host unreachable.

Ping statistics for 209.165.200.230:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

```

PC>tracert 209.165.200.230

Tracing route to 209.165.200.230 over a maximum of 30 hops:

  0  12 ms    0 ms     0 ms     192.168.30.1
  1  9 ms     0 ms    20 ms    172.31.21.2
  2  1 ms     *       13 ms    172.31.21.2
  3  *        17 ms   *        Request timed out.
  4  21 ms    *       13 ms    172.31.21.2
  5  *        21 ms   *        Request timed out.
  6  1 ms     *       13 ms    172.31.21.2
  7  *        1 ms    *        Request timed out.
  8  0 ms     *       15 ms    172.31.21.2
  9  *        0 ms    *        Request timed out.
 10 23 ms    *       13 ms    172.31.21.2
 11 *        18 ms   *        Request timed out.
 12 9 ms     *       1 ms     172.31.21.2
 13 *        17 ms   *        Request timed out.
 14 20 ms    *       13 ms    172.31.21.2
 15 *        14 ms   *        Request timed out.
 16 0 ms     *       0 ms     172.31.21.2
 17 *        1 ms    *        Request timed out.
 18 16 ms    *       24 ms    172.31.21.2
 19 *        10 ms   *        Request timed out.
 20 13 ms    *       17 ms    172.31.21.2
 21 *        12 ms   *        Request timed out.
 22 22 ms    *       23 ms    172.31.21.2
 23 *        12 ms   *        Request timed out.
 24 1 ms     *       0 ms     172.31.21.2
 25 *        13 ms   *        Request timed out.
 26 13 ms    *       13 ms    172.31.21.2
 27 *        24 ms   *        Request timed out.
 28 4 ms     *       7 ms     172.31.21.2
 29 *        14 ms   *        Request timed out.
 30

Trace complete.

PC>

```

Ilustración 10 ping Pc..

CONCLUSIONES

El documento consolidado en estas páginas “prueba de habilidades”, aplica los conocimientos estudiados en el diplomado.

Se logró satisfactoriamente la conexión en el escenario 1 y el escenario 2, la configuración, simulación de los dispositivos de la red corresponden a los casos de estudio.

Fue una experiencia muy llena de conocimiento este diplomado, fortalece mi formación académica y más en mi profesionalización en ingeniería electrónica.

Este primer paso en CISCO va a ser el abrir bocas a seguir formándose en Networking, que va a ser el emprendimiento del futuro digital, telecomunicaciones y electrónica.

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