

Evaluación – Prueba de habilidades prácticas CCNA

PRESENTADO POR:
Taylor Mosquera Castro

UNIVERSIDAD NACIONAL ABIERTA A DISTANCIA
“UNAD”
INGENIERIA DE SISTEMAS
APARTADO JULIO 2019

Contenido

INTRODUCCIÓN.....	3
ESCENARIO 1	4
Parte 1: Configuración del enrutamiento	5
Parte 2: Tabla de enrutamiento	15
Parte 3: Deshabilitar la propagación RIP.....	18
Parte 4: Verificación del protocolo RIP	19
Parte 5: Configurar encapsulamiento y autenticación PPP	25
Parte 6: Configuración de PAT	27
Parte 7: Configuración del servicio DHCP.....	28
ESCENARIO 2	31
OSPFv2 area 0.....	36
Verificar información de OSPF.....	39
Visualizar tablas de enrutamiento y routers conectados por OSPFv2	39
Visualizar lista resumida de interfaces por OSPF en donde se ilustre el costo de cada interface	39
Visualizar el OSPF Process ID, Router ID, Address summarizations, Routing Networks, and passive interfaces configuradas en cada router	40
CONCLUSIÓN.....	45
BIBLIOGRAFÍA	46

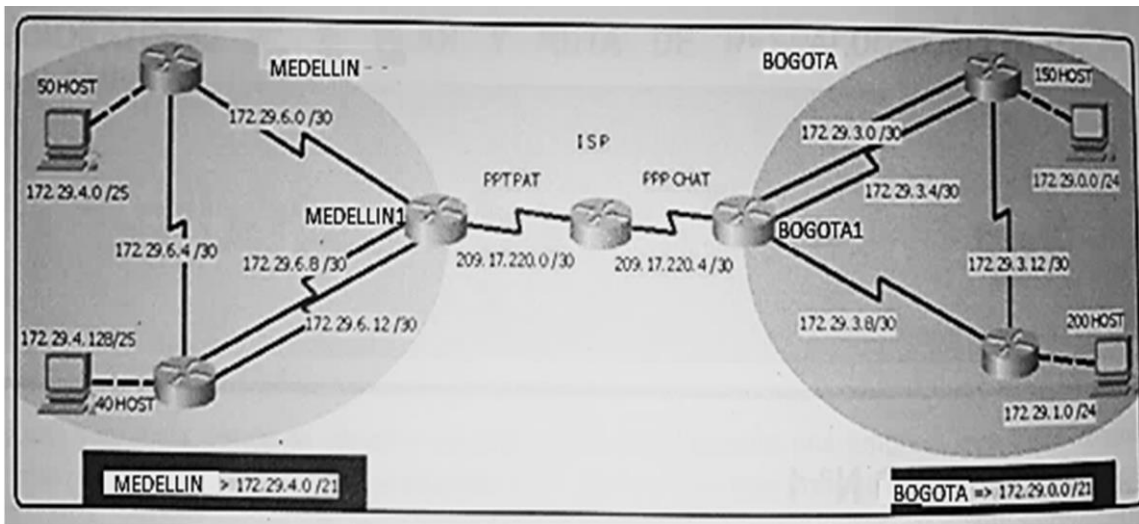
INTRODUCCIÓN

Un router o también conocido como enrutador o encaminador de paquetes, es un dispositivo que proporciona conectividad a nivel de red en el modelo OSI, mediante el uso del protocolo RIP en su versión 2, en el siguiente trabajo se da una mirada al uso cotidiano de los routers en las infraestructuras de red, desarrollando dos escenarios que pretenden poner a prueba el conocimiento obtenido durante la realización del seminario en redes Cisco, el documento incluye dos escenarios resueltos en donde se detalla las configuraciones que se deben realizar en los dispositivos para lograr la conectividad propuesta.

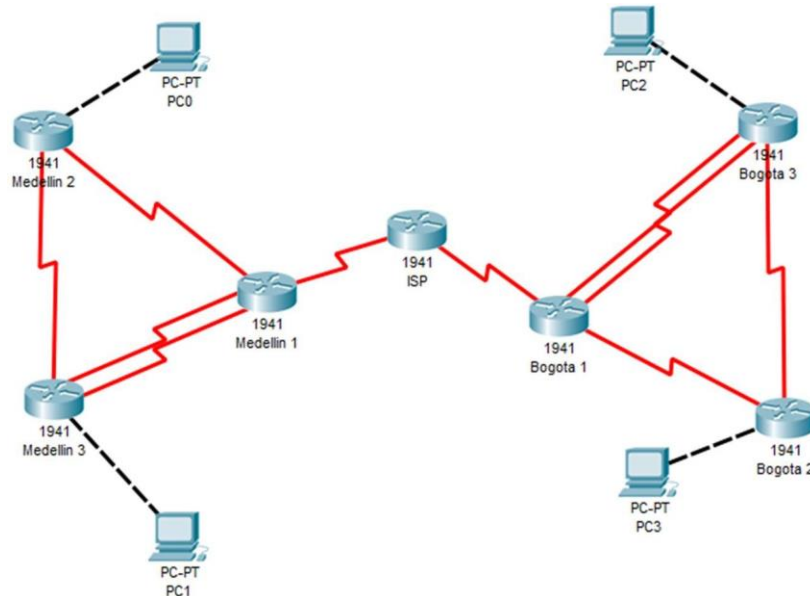
ESCENARIO 1

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.

Topología de red



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.

ISP

```
Router>en
```

```
Router#conf t
```

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

```
Router(config)#hostname ISP
```

```
ISP(config)#int s0/0/0
```

```
ISP(config-if)#ip address 209.17.220.1 255.255.255.252
```

```
ISP(config-if)#clock rate 4000000
```

```
ISP(config-if)#no shut
```

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

```
ISP(config-if)#int s0/0/1
```

```
ISP(config-if)#ip address 209.17.220.5 255.255.255.252
```

```
ISP(config-if)#clock rate 4000000
```

```
ISP(config-if)#no shut
```

```
%LINK-5-CHANGED: Interface Serial0/0/1, changed state to down
```

```
ISP(config-if)#
```

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

Medellín 1

```
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname medellin1
medellin1(config)#int s0/0/0
medellin1(config-if)#ip address 209.17.220.2 255.255.255.252
medellin1(config-if)#no shut
```

```
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to down
medellin1(config-if)#int s0/0/1
medellin1(config-if)#ip address 172.29.6.1 255.255.255.252
medellin1(config-if)#clock rate 4000000
This command applies only to DCE interfaces
medellin1(config-if)#no shut
```

```
%LINK-5-CHANGED: Interface Serial0/0/1, changed state to down
medellin1(config-if)#int s0/1/0
medellin1(config-if)#ip address 172.29.6.9 255.255.255.252
medellin1(config-if)#clock rate 4000000
This command applies only to DCE interfaces
medellin1(config-if)#no shut
```

```
%LINK-5-CHANGED: Interface Serial0/1/0, changed state to down
medellin1(config-if)#int s0/1/1
medellin1(config-if)#ip address 172.29.6.13 255.255.255.252
medellin1(config-if)#clock rate 4000000
This command applies only to DCE interfaces
medellin1(config-if)#no shut
```

```
medellin1(config-if)#
%LINK-5-CHANGED: Interface Serial0/1/1, changed state to up
```

```
medellin1(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1/1, changed state to up
```

Medellín 2

```
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
```

```
Router(config)#hostname medellin2
medellin2(config)#int s0/0/0
medellin2(config-if)#ip address 172.29.6.2 255.255.255.252
medellin2(config-if)#no shut
```

```
medellin2(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up
```

```
medellin2(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to up
```

```
medellin2(config-if)#int s0/0/1
medellin2(config-if)#ip address 172.29.6.5 255.255.255.252
medellin2(config-if)#clock rate 4000000
medellin2(config-if)#no shut
```

```
%LINK-5-CHANGED: Interface Serial0/0/1, changed state to down
medellin2(config-if)#int g0/0
medellin2(config-if)#ip address 172.29.4.1 255.255.255.128
medellin2(config-if)#no shut
```

```
medellin2(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
```

```
medellin2(config-if)#
```

Medellín 3

```
Router>en
Router#confi t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname medellin3
medellin3(config)#int s0/0/0
medellin3(config-if)#ip address 172.29.6.10 255.255.255.252
medellin3(config-if)#no shut
```

```
medellin3(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up
```

```
medellin3(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to up
```

```
medellin3(config-if)#int s0/0/1
```

```
medellin3(config-if)#ip address 172.29.6.14 255.255.255.252
medellin3(config-if)#no shut
```

```
medellin3(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/1, changed state to up
```

```
medellin3(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/1, changed state to up
```

```
medellin3(config-if)#int s0/1/0
medellin3(config-if)#ip address 172.29.6.6 255.255.255.252
medellin3(config-if)#no shut
```

```
medellin3(config-if)#
%LINK-5-CHANGED: Interface Serial0/1/0, changed state to up
```

```
medellin3(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1/0, changed state to up
```

```
medellin3(config-if)#int g0/0
medellin3(config-if)#ip address 172.29.4.129 255.255.255.128
medellin3(config-if)#no shut
```

```
medellin3(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
```

```
medellin3(config-if)#
```

Bogota 1

```
Router>en
```

```
Router#conf t
```

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

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

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

```
bogota1(config-if)#ip address 209.17.220.6 255.255.255.252
```

```
bogota1(config-if)#no shut
```

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

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

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

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



```
bogotal(config-if)#int s0/0/1
bogotal(config-if)#ip address 172.29.3.9 255.255.255.252
bogotal(config-if)#clock rate 4000000
bogotal(config-if)#no shut
```

%LINK-5-CHANGED: Interface Serial0/0/1, changed state to down

```
bogotal(config-if)#int s0/1/0
bogotal(config-if)#ip address 172.29.3.1 255.255.255.252
bogotal(config-if)#clock rate 4000000
bogotal(config-if)#no shut
```

%LINK-5-CHANGED: Interface Serial0/1/0, changed state to down

```
bogotal(config-if)#int s0/1/1
bogotal(config-if)#ip address 172.29.3.5 255.255.255.252
bogotal(config-if)#clock rate 4000000
bogotal(config-if)#no shut
```

%LINK-5-CHANGED: Interface Serial0/1/1, changed state to down

```
bogotal(config-if)#
bogotal(config-if)#
```

Bogota 2

```
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname bogota2
bogota2(config)#int g0/0
bogota2(config-if)#ip address 172.29.1.1 255.255.255.0
bogota2(config-if)#no shut

bogota2(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

bogota2(config-if)#int s0/0/0
bogota2(config-if)#ip address 172.29.3.10 255.255.255.252
bogota2(config-if)#no shut

bogota2(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up

bogota2(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to up

bogota2(config-if)#int s0/0/1
bogota2(config-if)#ip address 172.29.3.13 255.255.255.252
bogota2(config-if)#clock rate 4000000
bogota2(config-if)#no shut

%LINK-5-CHANGED: Interface Serial0/0/1, changed state to down
bogota2(config-if)#
```

Bogota 3

```
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname bogota3
bogota3(config)#int s0/0/0
bogota3(config-if)#ip address 172.29.3.2 255.255.255.252
bogota3(config-if)#no shut

bogota3(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up
```

```
bogota3(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to up

bogota3(config-if)#int s0/0/1
bogota3(config-if)#ip address 172.29.3.6 255.255.255.252
bogota3(config-if)#no shut

bogota3(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/1, changed state to up

bogota3(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/1, changed state to up

bogota3(config-if)#int g0/0
bogota3(config-if)#ip address 172.29.0.1 255.255.255.0
bogota3(config-if)#no shut

bogota3(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

bogota3(config-if)#
```

Configuración RIP

Medellin 1

```
medellin1>en
medellin1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
medellin1(config)#router rip
medellin1(config-router)#version 2
medellin1(config-router)#no auto-summary
medellin1(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

medellin1(config-router)#network 172.29.6.0
medellin1(config-router)#network 172.29.6.8
```

```
medellin1(config-router)#network 172.29.6.12
medellin1(config-router)#passive-interface s0/0/0
medellin1(config-router)#
medellin1#
%SYS-5-CONFIG_I: Configured from console by console

medellin1#
```

Medellin 2

```
medellin2>en
medellin2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
medellin2(config)#router rip
medellin2(config-router)#version 2
medellin2(config-router)#no auto-summary
medellin2(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

medellin2(config-router)#network 172.29.4.0
medellin2(config-router)#network 172.29.6.0
medellin2(config-router)#network 172.29.6.4
medellin2(config-router)#passive-interface g0/0
medellin2(config-router)#
medellin2#
%SYS-5-CONFIG_I: Configured from console by console

medellin2#
```

Medellin 3

```
medellin3>en
medellin3#conf t
Enter configuration commands, one per line. End with CNTL/Z.
medellin3(config)#router rip
medellin3(config-router)#version 2
medellin3(config-router)#no auto-summary
medellin3(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

```
medellin3(config-router)#network 172.29.4.128
medellin3(config-router)#network 172.29.6.4
medellin3(config-router)#network 172.29.6.8
medellin3(config-router)#network 172.29.6.12
medellin3(config-router)#passive-interface g0/0
medellin3(config-router)#
```

Bogota 1

```
bogota1>en
bogota1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
bogota1(config)#router rip
bogota1(config-router)#version 2
bogota1(config-router)#no auto-summary
bogota1(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
```

```
bogota1(config-router)#network 172.29.3.0
bogota1(config-router)#network 172.29.3.4
bogota1(config-router)#network 172.29.3.8
bogota1(config-router)#passive-interface s0/0/0
bogota1(config-router)#
```

Bogota 2

```
bogota2>en
bogota2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
bogota2(config)#router rip
bogota2(config-router)#version 2
bogota2(config-router)#no auto-summary
bogota2(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
```

```
bogota2(config-router)#network 172.29.1.0
bogota2(config-router)#network 172.29.3.8
bogota2(config-router)#network 172.29.3.12
bogota2(config-router)#passive-interface g0/0
bogota2(config-router)#
```

Bogota 3

```
bogota3>en
bogota3#conf t
Enter configuration commands, one per line. End with CNTL/Z.
bogota3(config)#router rip
bogota3(config-router)#version 2
bogota3(config-router)#no auto-summary
bogota3(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
bogota3(config-router)#network 172.29.0.0
bogota3(config-router)#network 172.29.3.0
bogota3(config-router)#network 172.29.3.4
bogota3(config-router)#passive-interface g0/0
bogota3(config-router)#
```

- b) Los routers 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

```
medellin1>en
medellin1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
medellin1(config)#ip route 0.0.0.0 0.0.0.0 209.17.220.1
medellin1(config)#router rip
medellin1(config-router)#default-information originate
medellin1(config-router)#
```

Bogota 1

```
bogota1>en
bogota1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
bogota1(config)#ip route 0.0.0.0 0.0.0.0 209.17.220.5
bogota1(config)#route rip
bogota1(config-router)#default-information origina
bogota1(config-router)#
```

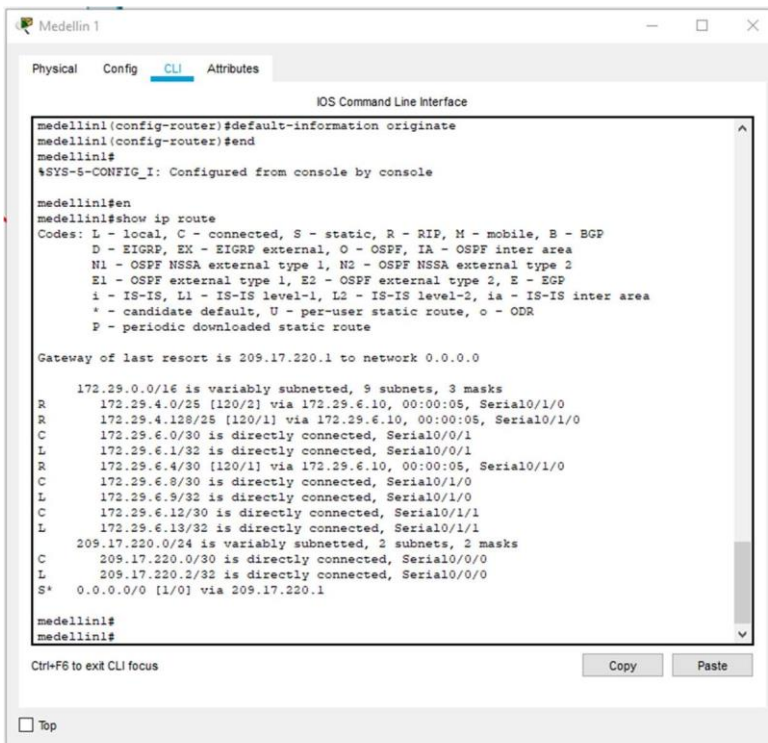
- c) El router ISP deberá tener una ruta estática dirigida hacia cada red interna de Bogotá y Medellín para el caso se sumarizan las subredes de cada uno a /22.

ISP

```
ISP>en
ISP#conf t
Enter configuration commands, one per line. End with CNTL/Z.
ISP(config)#ip route 172.29.4.0 255.255.252.0 209.17.220.2
ISP(config)#ip route 172.29.0.0 255.255.252.0 209.17.220.6
ISP(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.



```
Medellin 1
Physical Config CLI Attributes
IOS Command Line Interface
medellin1(config-router)#default-information originate
medellin1(config-router)#end
medellin1#
%SYS-5-CONFIG_I: Configured from console by console

medellin1#en
medellin1#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 209.17.220.1 to network 0.0.0.0

172.29.0.0/16 is variably subnetted, 9 subnets, 3 masks
R 172.29.4.0/25 [120/2] via 172.29.6.10, 00:00:05, Serial0/1/0
R 172.29.4.128/25 [120/1] via 172.29.6.10, 00:00:05, Serial0/1/0
C 172.29.6.0/30 is directly connected, Serial0/0/1
L 172.29.6.1/32 is directly connected, Serial0/0/1
R 172.29.6.4/30 [120/1] via 172.29.6.10, 00:00:05, Serial0/1/0
C 172.29.6.8/30 is directly connected, Serial0/1/0
L 172.29.6.9/32 is directly connected, Serial0/1/0
C 172.29.6.12/30 is directly connected, Serial0/1/1
L 172.29.6.13/32 is directly connected, Serial0/1/1
209.17.220.0/24 is variably subnetted, 2 subnets, 2 masks
C 209.17.220.0/30 is directly connected, Serial0/0/0
L 209.17.220.2/32 is directly connected, Serial0/0/0
S* 0.0.0.0/0 [1/0] via 209.17.220.1

medellin1#
medellin1#
```

```

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

bogotal#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 209.17.220.5 to network 0.0.0.0

     172.29.0.0/16 is variably subnetted, 6 subnets, 2 masks
C       172.29.3.0/30 is directly connected, Serial0/1/0
L       172.29.3.1/32 is directly connected, Serial0/1/0
C       172.29.3.4/30 is directly connected, Serial0/1/1
L       172.29.3.5/32 is directly connected, Serial0/1/1
C       172.29.3.8/30 is directly connected, Serial0/0/1
L       172.29.3.9/32 is directly connected, Serial0/0/1
     209.17.220.0/24 is variably subnetted, 2 subnets, 2 masks
C       209.17.220.4/30 is directly connected, Serial0/0/0
L       209.17.220.6/32 is directly connected, Serial0/0/0
S*    0.0.0.0/0 [1/0] via 209.17.220.5

bogotal#

```

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


```
Medellin 3
Physical Config CLI Attributes
IOS Command Line Interface

medellin3>en
medellin3#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 172.29.6.9 to network 0.0.0.0

172.29.0.0/16 is variably subnetted, 10 subnets, 3 masks
R 172.29.4.0/25 [120/1] via 172.29.6.9, 00:00:14, Serial0/1/0
C 172.29.4.128/25 is directly connected, GigabitEthernet0/0
L 172.29.4.128/32 is directly connected, GigabitEthernet0/0
R 172.29.6.0/30 [120/1] via 172.29.6.9, 00:00:14, Serial0/1/0
[120/1] via 172.29.6.9, 00:00:21, Serial0/0/0
C 172.29.6.4/30 is directly connected, Serial0/1/0
L 172.29.6.6/32 is directly connected, Serial0/1/0
C 172.29.6.8/30 is directly connected, Serial0/0/0
L 172.29.6.10/32 is directly connected, Serial0/0/0
C 172.29.6.12/30 is directly connected, Serial0/0/1
L 172.29.6.14/32 is directly connected, Serial0/0/1
--More--

Ctrl+F6 to exit CLI focus Copy Paste
 Top
```

```
Bogota 3
Physical Config CLI Attributes
IOS Command Line Interface

bogota3#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 not set

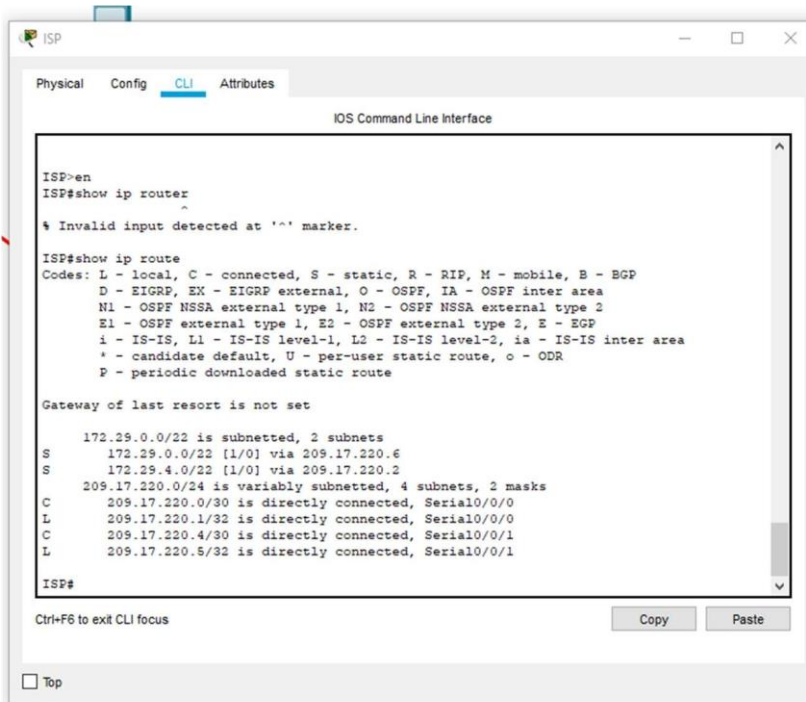
172.29.0.0/16 is variably subnetted, 6 subnets, 3 masks
C 172.29.0.0/24 is directly connected, GigabitEthernet0/0
L 172.29.0.1/32 is directly connected, GigabitEthernet0/0
C 172.29.3.0/30 is directly connected, Serial0/0/0
L 172.29.3.2/32 is directly connected, Serial0/0/0
C 172.29.3.4/30 is directly connected, Serial0/0/1
L 172.29.3.6/32 is directly connected, Serial0/0/1

bogota3#

Ctrl+F6 to exit CLI focus Copy Paste
 Top
```

- 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.
- d) Los routers Medellín2 y Bogotá2 también presentan redes conectadas directamente y recibidas mediante RIP.
- e) Las tablas de los routers restantes deben permitir visualizar rutas redundantes para el caso de la ruta por defecto.
- f) El router ISP solo debe indicar sus rutas estáticas adicionales a las directamente conectadas.

Punto c,d,e y f



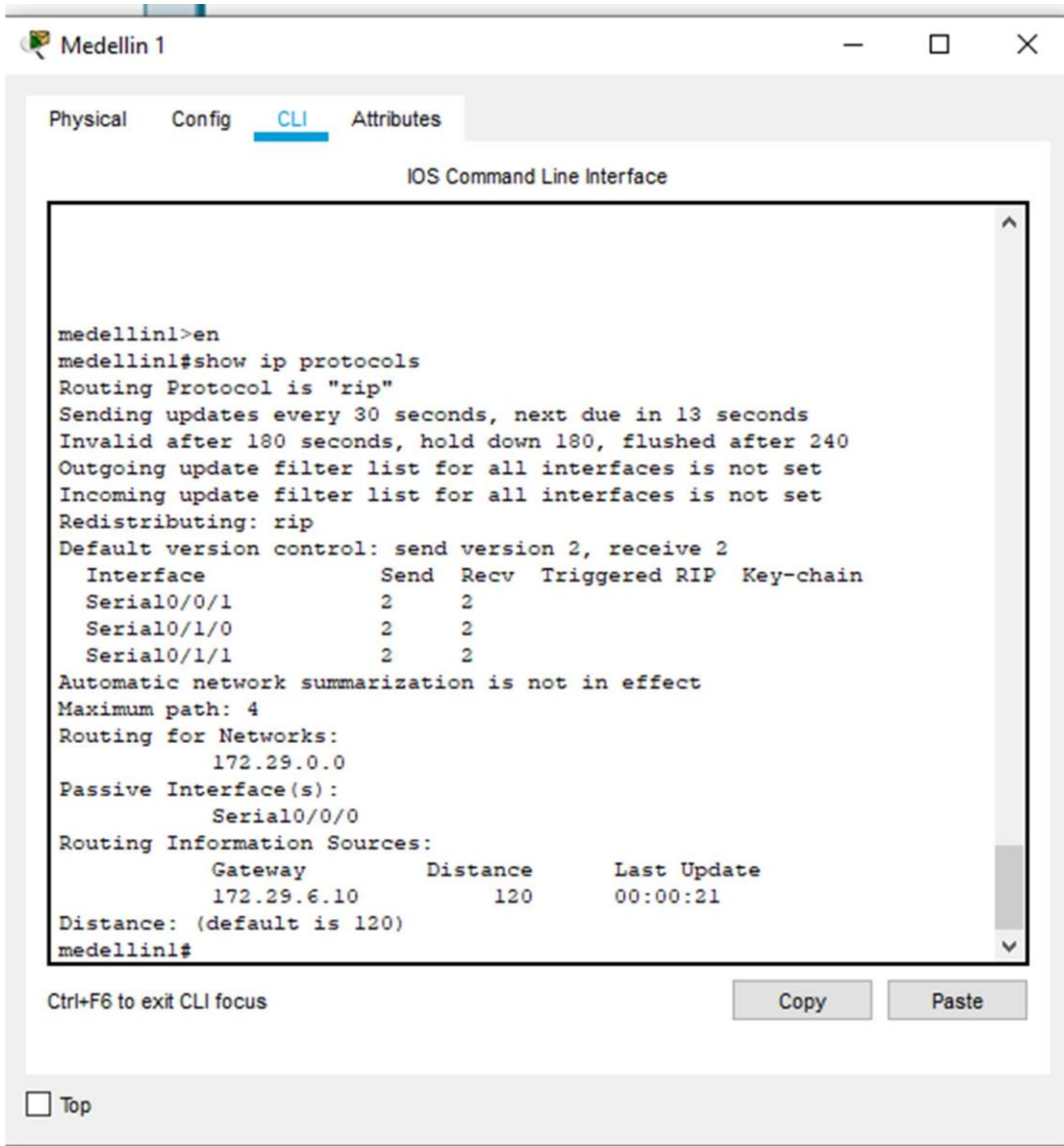
Parte 3: Deshabilitar la propagacion RIP

- 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.

Ya se realizó cuando se configuro RIP

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.



```
medellin1>en
medellin1#show ip protocols
Routing Protocol is "rip"
  Sending updates every 30 seconds, next due in 13 seconds
  Invalid after 180 seconds, hold down 180, flushed after 240
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Redistributing: rip
  Default version control: send version 2, receive 2
    Interface          Send  Recv  Triggered RIP  Key-chain
  Serial0/0/1          2     2
  Serial0/1/0          2     2
  Serial0/1/1          2     2
  Automatic network summarization is not in effect
  Maximum path: 4
  Routing for Networks:
    172.29.0.0
  Passive Interface(s):
    Serial0/0/0
  Routing Information Sources:
    Gateway         Distance    Last Update
    172.29.6.10     120        00:00:21
  Distance: (default is 120)
medellin1#
```

Ctrl+F6 to exit CLI focus

Copy Paste

Top

Medellin 2

Physical Config **CLI** Attributes

IOS Command Line Interface

```
medellin2>en
medellin2#show ip protocols
Routing Protocol is "rip"
Sending updates every 30 seconds, next due in 4 seconds
Invalid after 180 seconds, hold down 180, flushed after 240
Outgoing update filter list for all interfaces is not set
Incoming update filter list for all interfaces is not set
Redistributing: rip
Default version control: send version 2, receive 2
  Interface          Send Recv Triggered RIP Key-chain
  Serial0/0/0        2     2
  Serial0/0/1        2     2
Automatic network summarization is not in effect
Maximum path: 4
Routing for Networks:
  172.29.0.0
Passive Interface(s):
  GigabitEthernet0/0
Routing Information Sources:
  Gateway            Distance    Last Update
  172.29.6.6         120        00:00:29
Distance: (default is 120)
medellin2#
```

Ctrl+F6 to exit CLI focus

Copy Paste

Top

Medellin 3

Physical Config **CLI** Attributes

IOS Command Line Interface

```
medellin3>
medellin3>en
medellin3#show ip protocols
Routing Protocol is "rip"
Sending updates every 30 seconds, next due in 23 seconds
Invalid after 180 seconds, hold down 180, flushed after 240
Outgoing update filter list for all interfaces is not set
Incoming update filter list for all interfaces is not set
Redistributing: rip
Default version control: send version 2, receive 2
  Interface          Send  Recv  Triggered RIP  Key-chain
  Serial0/0/0         2     2
  Serial0/0/1         2     2
  Serial0/1/0         2     2
Automatic network summarization is not in effect
Maximum path: 4
Routing for Networks:
  172.29.0.0
Passive Interface(s):
  GigabitEthernet0/0
Routing Information Sources:
  Gateway            Distance    Last Update
  172.29.6.9         120         00:00:02
  172.29.6.5         120         00:00:28
Distance: (default is 120)
medellin3#
```

Ctrl+F6 to exit CLI focus

Copy Paste

Top

Bogota 1

Physical Config **CLI** Attributes

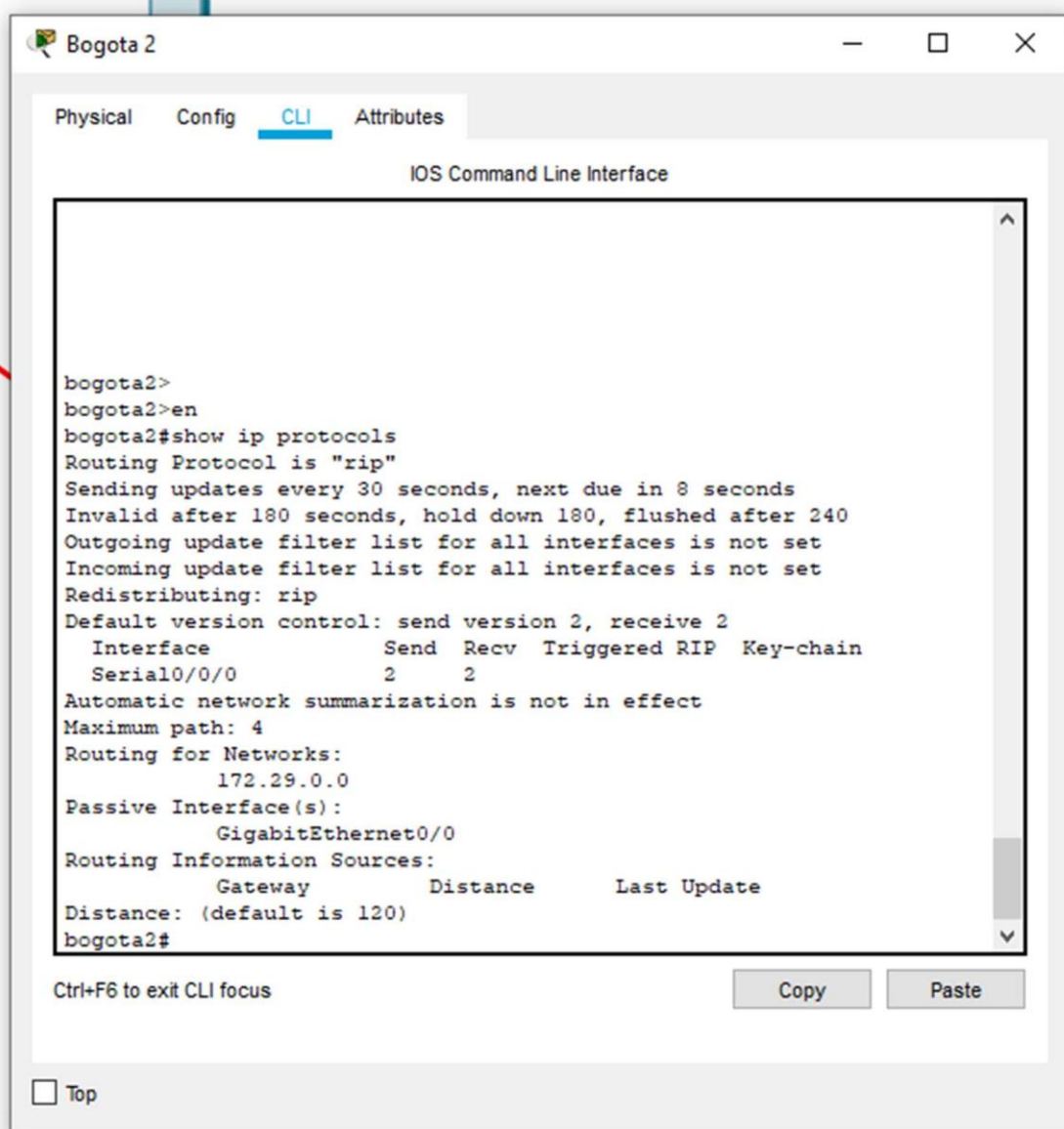
IOS Command Line Interface

```
bogotal>en
bogotal#show ip protocols
Routing Protocol is "rip"
Sending updates every 30 seconds, next due in 10 seconds
Invalid after 180 seconds, hold down 180, flushed after 240
Outgoing update filter list for all interfaces is not set
Incoming update filter list for all interfaces is not set
Redistributing: rip
Default version control: send version 2, receive 2
  Interface          Send  Recv  Triggered RIP  Key-chain
  Serial0/1/0        2     2
  Serial0/1/1        2     2
  Serial0/0/1        2     2
Automatic network summarization is not in effect
Maximum path: 4
Routing for Networks:
  172.29.0.0
Passive Interface(s):
  Serial0/0/0
Routing Information Sources:
  Gateway           Distance      Last Update
Distance: (default is 120)
bogotal#
```

Ctrl+F6 to exit CLI focus

Copy Paste

Top



```
bogota3>
bogota3>en
bogota3#show ip protocols
Routing Protocol is "rip"
Sending updates every 30 seconds, next due in 12 seconds
Invalid after 180 seconds, hold down 180, flushed after 240
Outgoing update filter list for all interfaces is not set
Incoming update filter list for all interfaces is not set
Redistributing: rip
Default version control: send version 2, receive 2
  Interface          Send  Recv  Triggered RIP  Key-chain
  Serial0/0/0         2     2
  Serial0/0/1         2     2
Automatic network summarization is not in effect
Maximum path: 4
Routing for Networks:
  172.29.0.0
Passive Interface(s):
  GigabitEthernet0/0
Routing Information Sources:
  Gateway            Distance    Last Update
Distance: (default is 120)
bogota3#
```

Ctrl+F6 to exit CLI focus

Copy Paste

Top

- 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

medellin1#conf t

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

medellin1(config)#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

Bogota 1

```
bogota1(config)#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
```

Parte 5: Configurar encapsulamiento y autenticación PPP.

- a) Según la topología se requiere que el enlace Medellín1 con ISP sea configurado con autenticación PAT.
- b) El enlace Bogotá1 con ISP se debe configurar con autenticación CHAT.

ISP

```
ISP>en
ISP#conf t
Enter configuration commands, one per line. End with CNTL/Z.
ISP(config)#username MEDELLIN password cisco
ISP(config)#int 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 cisco
ISP(config-if)#end
ISP#
%SYS-5-CONFIG_I: Configured from console by console

ISP#conf t
Enter configuration commands, one per line. End with CNTL/Z.
ISP(config)#username BOGOTA password cisco
ISP(config)#int s0/0/1
ISP(config-if)#encapsulation ppp
ISP(config-if)#
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/1, changed state to down
```

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

Medellin 1

```
medellin1#conf t
```

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

```
medellin1(config)#username ISP password cisco
```

```
medellin1(config)#
```

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

```
medellin1(config)#int s0/0/0
```

```
medellin1(config-if)#encapsulation ppp
```

```
medellin1(config-if)#ppp authentication pap
```

```
medellin1(config-if)#ppp pap sent-username MEDELLIN password cisco
```

```
medellin1(config-if)#end
```

```
medellin1#
```

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

```
medellin1#ping 209.17.220.1 Type escape sequence to abort.
```

```
Sending 5, 100-byte ICMP Echos to 209.17.220.1, timeout is 2 seconds:
```

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

```
.....
```

```
Success rate is 0 percent (0/5)
```

```
medellin1#ping 209.17.220.1 Type escape sequence to abort.
```

```
Sending 5, 100-byte ICMP Echos to 209.17.220.1, timeout is 2 seconds:
```

```
!!!!
```

```
Success rate is 100 percent (5/5), round-trip min/avg/max = 3/4/9 ms
```

BOGOTA 1

```
bogota1>en
```

```
bogota1#conf t
```

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

```
bogota1(config)#username ISP password cisco
```

```
bogota1(config)#
```

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

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

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

```
bogota1(config-if)#ppp authentication chap
bogota1(config-if)#
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, cómo 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, cómo diferente puerto.

MEDELLIN 1

```
medellin1>enable
medellin1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
medellin1(config)#ip nat inside source list 1 interface s0/0/0 overload
medellin1(config)#
medellin1(config)#ip nat inside source list 1 interface s0/0/0 overload
medellin1(config)#access-list 1 permit 172.29.4.0 0.0.3.255
medellin1(config)#
medellin1(config)# int S0/0/0
medellin1(config-if)#ip nat outside
medellin1(config-if)# int S0/0/1
medellin1(config-if)#ip nat inside
medellin1(config-if)#ip nat inside
medellin1(config-if)# int S0/1/1
medellin1(config-if)#ip nat inside
medellin1(config-if)#int S0/1/0
medellin1(config-if)#ip nat inside
medellin1(config-if)#
```

BOGOTA 1

```
bogota1>en
bogota1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
bogota1(config)#ip nat inside source list 1 interface s0/0/0 overload
bogota1(config)#access-list 1 permit 172.29.0.0 0.0.3.255
bogota1(config)#int s0/0/0
bogota1(config-if)#ip nat outside
bogota1(config-if)#int s0/1/0
bogota1(config-if)#ip nat inside
bogota1(config-if)#int s0/1/1
bogota1(config-if)#ip nat inside
bogota1(config-if)#
```

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

```
medellin2>en
medellin2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
medellin2(config)#ip dhcp excluded-address 172.29.4.1 172.29.4.5
medellin2(config)#ip dhcp excluded-address 172.29.4.129 172.29.4.133
medellin2(config)#ip dhcp pool medellin2
medellin2(dhcp-config)#network 172.29.4.0 255.255.255.128
medellin2(dhcp-config)#default-router 172.29.4.1
medellin2(dhcp-config)#dns-server 8.8.8.8
medellin2(dhcp-config)#exit
medellin2(config)#ip dhcp pool medellin3
medellin2(dhcp-config)#network 172.29.4.128 255.255.255.128
medellin2(dhcp-config)#default-router 172.29.4.129
medellin2(dhcp-config)#dns-server 8.8.8.8
```

```
medellin2(dhcp-config)#exit
```

MEDELLIN 3

```
medellin3>en
medellin3#conf t
Enter configuration commands, one per line. End with CNTL/Z.
medellin3(config)#int g0/0
medellin3(config-if)#ip helper-address 172.29.6.5
medellin3(config-if)#
```

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

BOGOTA3

```
bogota3>en
bogota3#conf t
Enter configuration commands, one per line. End with CNTL/Z.
bogota3(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
bogota3(config)#ip dhcp pool bogota2
bogota3(dhcp-config)#network 172.29.1.0 255.255.255.0
bogota3(dhcp-config)#default-router 172.29.1.1
bogota3(dhcp-config)#dns-server 8.8.8.8
bogota3(dhcp-config)#ip dhcp pool BOGOTA3
bogota3(dhcp-config)#network 172.29.0.0 255.255.255.0
bogota3(dhcp-config)#default-router 172.29.0.1
bogota3(dhcp-config)#dns-server 8.8.8.8
bogota3(dhcp-config)#
```

BOGOTA3

```
bogota3>en
bogota3#conf t
```

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

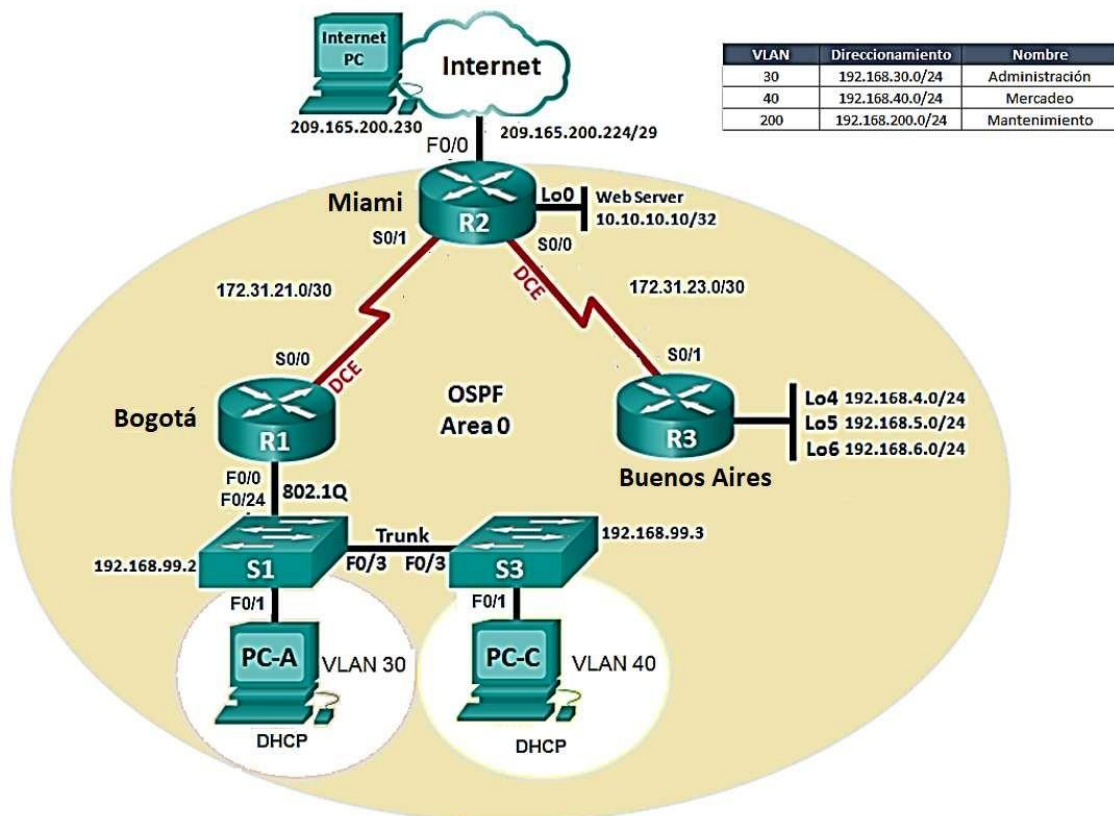
```
bogota3(config)#int g0/0
```

```
bogota3(config-if)#ip helper-address 172.29.3.13
```

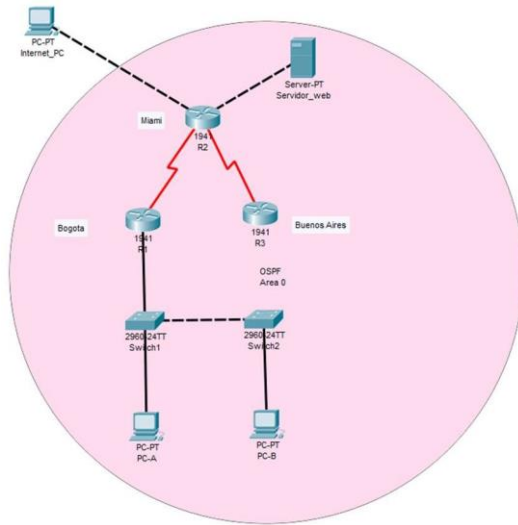
```
bogota3(config-if)#
```

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.



1. Configurar el direccionamiento IP acorde con la topología de red para cada uno de los dispositivos que forman parte del escenario



Router R1

```

Router>ena
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#no ip domain-lookup
Router(config)#hostname R1
R1(config)#enable secret class
R1(config)#line con 0
R1(config-line)#pass cisco
R1(config-line)#login
R1(config-line)#line vty 0 15
R1(config-line)#pass cisco
R1(config-line)#login
R1(config-line)#exit
R1(config)#service password-encryption
R1(config)#banner motd #Acceso solo a personal autorizado#
R1(config)#int s0/0/0
R1(config-if)#ip address 172.31.21.1 255.255.255.252
R1(config-if)#clock rate 128000
R1(config-if)#no shut

%LINK-5-CHANGED: Interface Serial0/0/0, changed state to down
R1(config-if)#

```

Router R2


```
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#no ip domain-lookup
Router(config)#hostname R2
R2(config)#enable secret class
R2(config)#line con 0
R2(config-line)#pass cisco
R2(config-line)#login
R2(config-line)#line vty 0 15
R2(config-line)#pass cisco
R2(config-line)#login
R2(config-line)#exit
R2(config)#service password-encryption
```

```
R2(config)#banner motd #Acceso solo a personal autorizado#
R2(config)#int s0/0/0
R2(config-if)#ip address 172.31.23.1 255.255.255.252
R2(config-if)#clock rate 128000
R2(config-if)#no shut
```

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

```
R2(config-if)#int s0/0/1
R2(config-if)#ip address 172.31.21.2 255.255.255.252
R2(config-if)#no shut
```

```
R2(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/1, changed state to up
```

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/1, changed state to up

```
R2(config-if)#int g0/0
R2(config-if)#description conexion a ISP
R2(config-if)#ip address 209.165.200.225 255.255.255.248
R2(config-if)#no shut
```

```
R2(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state
to up
```

Router R3

```
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#no ip domain-lookup
```

```
Router(config)#hostname R3
R3(config)#enable secret class
R3(config)#line con 0
R3(config-line)#pass cisco
R3(config-line)#login
R3(config-line)#line vty 0 15
R3(config-line)#pass cisco
R3(config-line)#login
R3(config-line)#exit
R3(config)#banner motd #Acceso solo a personal autorizado#
R3(config)#service password-encryption
R3(config)#int s0/0/0
R3(config-if)#ip address 172.31.23.2 255.255.255.252
R3(config-if)#no shut
```

```
R3(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up
```

```
R3(config-if)#
R3(config)#int lo4
R3(config-if)#
%LINK-5-CHANGED: Interface Loopback4, changed state to up
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback4, changed state to up
```

```
R3(config-if)#ip address 192.168.4.1 255.255.255.0
R3(config-if)#no shut
R3(config-if)#int lo5
```

```
R3(config-if)#
%LINK-5-CHANGED: Interface Loopback5, changed state to up
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback5, changed state to up
```

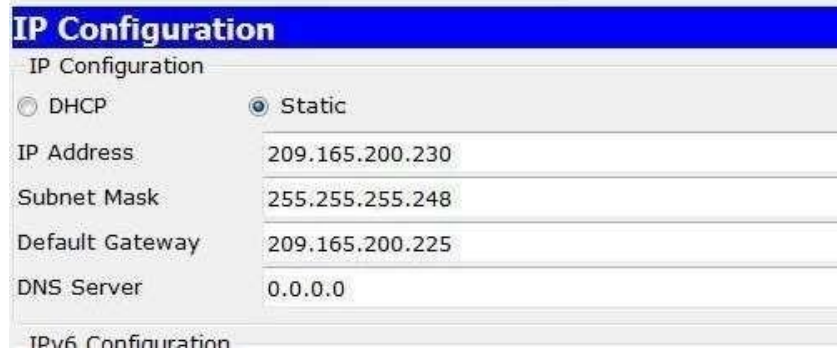
```
R3(config-if)#ip address 192.168.5.1 255.255.255.0
R3(config-if)#no shut
R3(config-if)#int lo6
```

```
R3(config-if)#
%LINK-5-CHANGED: Interface Loopback6, changed state to up
```

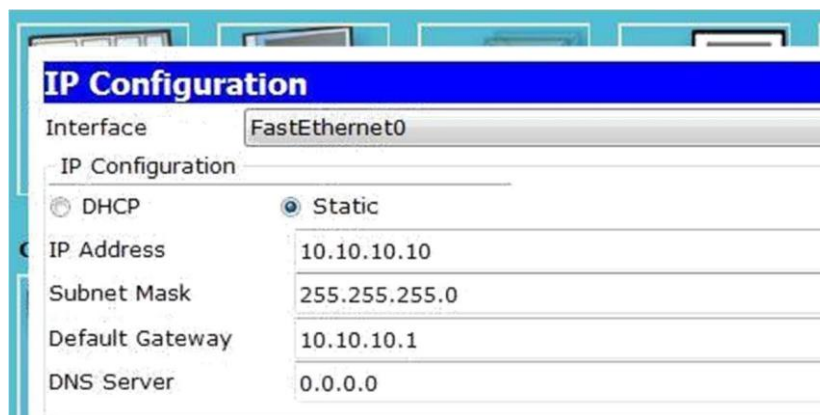
```
%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback6, changed state to up
```

```
R3(config-if)#ip address 192.168.6.1 255.255.255.0
R3(config-if)#no shut
R3(config-if)#
```

Internet PC



Web Server



Switch S1

```
Switch>en
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#no ip domain-lookup
Switch(config)#hostname S1
S1(config)#enable secret class
S1(config)#line con 0
S1(config-line)#pass cisco
S1(config-line)#login
S1(config-line)#line vty 0 15
S1(config-line)#pass cisco
S1(config-line)#login
```

```

S1(config-line)#exit
S1(config)#service password-encryption

S1(config)#banner motd #Acceso solo a personal autorizado#
S1(config)#exit
S1#
%SYS-5-CONFIG_I: Configured from console by console

S1#copy run startup
Destination filename [startup-config]?
Building configuration... [OK]
S1#

```

Switch S2

```

Switch>en
Switch#config t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#no ip domain-lookup
Switch(config)#hostname S2
S2(config)#enable secret class
S2(config)#line con 0
S2(config-line)#pass cisco
S2(config-line)#login
S2(config-line)#line vty 0 15
S2(config-line)#pass cisco
S2(config-line)#login
S2(config-line)#exit
S2(config)#service password-encryption

S2(config)#banner motd #Acceso solo a personal autorizado#
S2(config)#exit
S2#
%SYS-5-CONFIG_I: Configured from console by console

S2#copy run startup
Destination filename [startup-config]?
Building configuration... [OK]
S2#

```

2. Configurar el protocolo de enrutamiento OSPFv2 bajo los siguientes criterios:

OSPFv2 area 0

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

Router R1

```

R1#config t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#router ospf 1
R1(config-router)#router-id 1.1.1.1
R1(config-router)#network 172.31.21.0 0.0.0.3 area 0
R1(config-router)#network 192.168.30.0 0.0.0.3 area 0
R1(config-router)#network 192.168.40.0 0.0.0.3 area 0
R1(config-router)#network 192.168.30.0 0.0.0.255 area 0
R1(config-router)#network 192.168.40.0 0.0.0.255 area 0
R1(config-router)#network 192.168.200.0 0.0.0.255 area 0
R1(config-router)#passive-interface f0/1.30
%Invalid interface type and number
R1(config-router)#passive- interface f0/0.30
%Invalid interface type and number
R1(config-router)#passive-interface f0/0
R1(config-router)#auto-cost reference- bandwidth 9500
% OSPF: Reference bandwidth is changed.

```

Please ensure reference bandwidth is consistent across all routers.

```

R1(config-router)#exit
R1(config)#int s0/0/0
R1(config-if)#bandwidth 256
R1(config-if)#ip ospf cost 9500
R1(config-if)#end
R1#
%SYS-5-CONFIG_I: Configured from console by console

```

Router R2

```
R2#config t
```

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

```
R2(config)#router ospf 1
```

```
R2(config-router)#router-id 5.5.5.5
```

```
R2(config-router)#network 172.31.21.0 0.0.0.3 area 0
```

```
R2(config-router)#network 172.31.21.0 0.0.0.3 area 0
```

```
00:55:46: %OSPF-5-ADJCHG: Process 1, Nbr 1.1.1.1 on Serial0/0/1 from LOADING to FULL, Lding Done
```

```
R2(config-router)#network 172.31.23.0 0.0.0.3 area 0
```

```
R2(config-router)#network 10.10.10.0 0.0.0.255 area 0
```

```
R2(config-router)#passive-interface f0/0
```

```
R2(config-router)#auto-cost reference-bandwidth 9500
```

```
% OSPF: Reference bandwidth is changed.
```

Please ensure reference bandwidth is consistent across all routers.

```
R2(config-router)#int s0/0/0
```

```
R2(config-if)#bandwidth 256
```

```
R2(config-if)#int s0/0/1
```

```
R2(config-if)#bandwidth 256
```

```
R2(config-if)#int s0/0/0
```

```
R2(config-if)#ip ospf cost 9500
```

```
R2(config-if)#exit
```

```
R2(config)#
```

Router R3

```
R3#config
```

Configuring from terminal, memory, or network [terminal]? Enter configuration commands, one per line. End with CNTL/Z.

```
R3(config)#router ospf 1
```

```
R3(config-router)#router-id 8.8.8.8
```

```
R3(config-router)#network 172.31.23.0 0.0.0.3 area 0
```

```
R3(config-router)#
```

```
01:01:48: %OSPF-5-ADJCHG: Process 1, Nbr 5.5.5.5 on Serial0/0/1 from LOADING to FULL, Loading Done
```

```
R3(config-router)#network 192.168.4.0 0.0.3.255 area 0
```

```
R3(config-router)#passive-interface lo4
```

```
R3(config-router)#passive-interface lo5
```

```
R3(config-router)#passive-interface lo6
```

```
R3(config-router)#auto-cost reference-bandwidth 9500
```

```
% OSPF: Reference bandwidth is changed.
```

Please ensure reference bandwidth is consistent across all routers.

```
R3(config-router)#exit
```

```
R3(config)#int s0/0/1
R3(config-if)#bandwidth 256
R3(config-if)#exit
R3(config)#
```

Verificar información de OSPF

Visualizar tablas de enrutamiento y routers conectados por OSPFv2

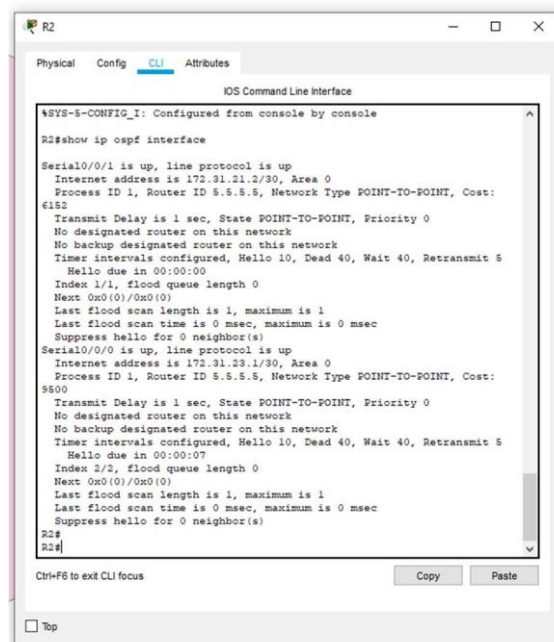
```
R2#show ip ospf neig
```

Neighbor ID	Pri	State	Dead Time	Address	Interface
8.8.8.8	0	FULL/ -	00:00:39	172.31.23.2	Serial0/0/0
1.1.1.1	0	FULL/ -	00:00:38	172.31.21.1	Serial0/0/1

```
R2#
```

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

Router R2



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

```
!
router ospf 1
  router-id 5.5.5.5
  log-adjacency-changes
  passive-interface FastEthernet0/0
  auto-cost reference-bandwidth 9500
  network 172.31.21.0 0.0.0.3 area 0
  network 172.31.23.0 0.0.0.3 area 0
  network 10.10.10.0 0.0.0.255 area 0
!
ip classless
!
```

3. Configurar vlans, puertos troncales, puertos de acceso, encapsulamiento, inter-vlan routing y seguridad en los switches acorde a la topología de red establecida.

Switch S1

```
S1#config t
Enter configuration commands, one per line. End with CNTL/Z.
S1(config)#vlan 30
S1(config-vlan)#name Administracion
S1(config-vlan)#vlan 40
S1(config-vlan)#name Mercadeo
S1(config-vlan)#vlan 200
S1(config-vlan)#name Mantenimiento
S1(config-vlan)#exit
S1(config)#
S1(config-if)#ip add 192.168.99.2 255.255.255.0
S1(config-if)#no shutdown
S1(config-if)#exit
S1(config)#ip default-gateway 192.168.99.1
S1(config)#int 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)#switchport trunk native vlan 1
S1(config-if)#int f0/24
S1(config-if)#switchport mode trunk
S1(config-if)#switchport trunk native vlan 1
S1(config-if)#int range f0/2, f0/4-23
S1(config-if-range)#switch mode access
S1(config-if-range)#int f0/1
S1(config-if)#switch mode access
S1(config-if)#switch access vlan 30
S1(config-if)#int range f0/2, f0/4- 23
S1(config-if-range)#shutdown
```

Router R1

R1#config t

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

```
R1(config)#int g0/1.30
R1(config-subif)#encapsulation dot1q 30
R1(config-subif)#ip add 192.168.30.1 255.255.255.0
R1(config-subif)#int g0/1.40
R1(config-subif)#ip add 192.168.40.1 255.255.255.0
```

% Configuring IP routing on a LAN subinterface is only allowed if that subinterface is already configured as part of an IEEE 802.10, IEEE 802.1Q, or ISL vLAN.

```
R1(config-subif)#
R1(config-subif)#int g0/1.40
R1(config-subif)#encapsulation dot1q 40
R1(config-subif)#ip add 192.168.40.1 255.255.255.0
R1(config-subif)#int g0/1.200
R1(config-subif)#encapsulation dot1q 200
R1(config-subif)#ip add 192.168.200.1 255.255.255.0
R1(config-subif)#exit
R1(config)#
```

4. En el Switch 3 deshabilitar DNS lookup
5. Asignar direcciones IP a los Switches acorde a los lineamientos.
6. Desactivar todas las interfaces que no sean utilizadas en el esquema de red.

7. Implement DHCP and NAT for IPv4
8. Configurar R1 como servidor DHCP para las VLANs 30 y 40.

Router R1

```

R1(config)#
R1(config)#ip dhcp excluded-address 192.168.30.1 192.168.30.30
R1(config)#ip dhcp excluded-address 192.168.40.1 192.168.40.30
R1(config)#ip dhcp pool Administracion
R1(dhcp-config)#dns-server 10.10.10.11
R1(dhcp-config)#default-router 192.168.30.1
R1(dhcp-config)#network 192.168.30.0 255.255.255.0
R1(dhcp-config)#ip dhcp pool Mercadeo
R1(dhcp-config)#dns-server 10.10.10.11
R1(dhcp-config)#default-router 192.168.40.1
R1(dhcp-config)#network 192.168.40.0 255.255.255.0
R1(dhcp-config)#exit
R1(config)#

```

9. 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.

Router R2

```

R2#config t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#user webuser privilege 15 secret cisco12345
R2(config)#ip http server
% Invalid input detected at '^' marker.

```

```
R2(config)#
```

Dado que no se puede utilizar los comandos ip http server se emplea un servidor dentro de la topología

```
R2(config)#  
R2(config)#ip nat inside source static 10.10.10.10 209.165.200.229  
R2(config)#int g0/0  
R2(config-if)#ip nat outside  
R2(config-if)#int f0/1  
R2(config-if)#ip nat inside  
R2(config-if)#
```

10. 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.

Router R2

```
R2(config)#access-list 1 permit 192.168.30.0 0.0.0.255  
R2(config)#access-list 1 permit 192.168.40.0 0.0.0.255  
R2(config)#ip nat pool INTERNET 209.165.200.225 209.165.200.228 netmask  
255.255.255.248  
R2(config)#ip nat inside source list 1 pool INTERNET  
R2(config)#exit  
R2#  
%SYS-5-CONFIG_I: Configured from console by console
```

```
R2(config)#ip access-list standard ADMIN_S  
R2(config-std-nacl)#permit host 172.31.21.1  
R2(config-std-nacl)#exit  
R2(config)#line vty 0 4  
R2(config-line)#access-class ADMIN_S in  
R2(config-line)#
```

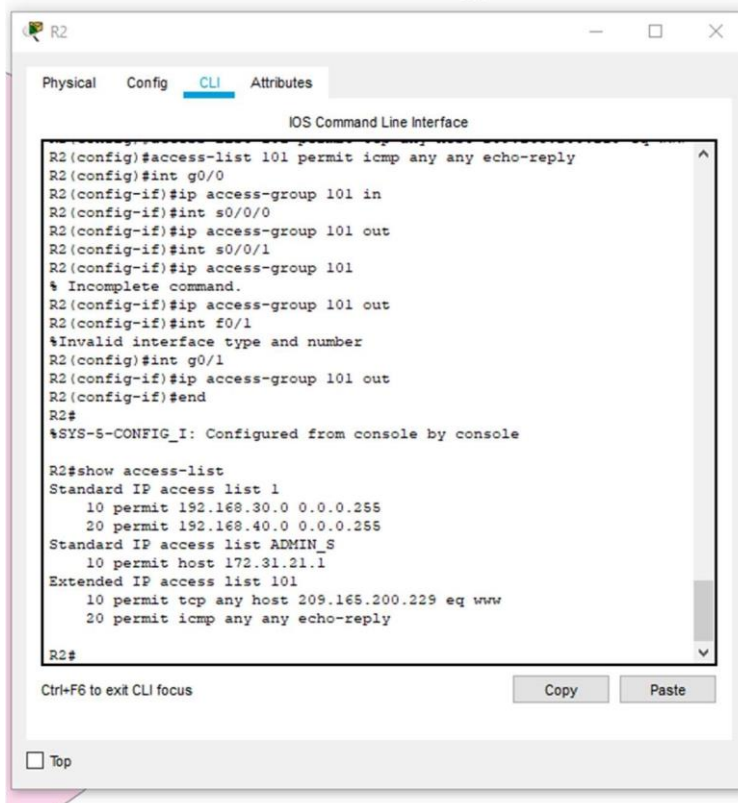
11. Configurar al menos dos listas de acceso de tipo extendido o nombradas a su criterio en para restringir o permitir tráfico desde R1 o R3 hacia R2.

Router R2

```
R2(config)#access-list 101 permit tcp any host 209.165.200.229 eq www  
R2(config)#access-list 101 permit icmp any any echo-reply  
R2(config)#int g0/0
```

```
R2(config-if)#ip access-group 101 in
R2(config-if)#int s0/0/0
R2(config-if)#ip access-group 101 out
R2(config-if)#int s0/0/1
R2(config-if)#ip access-group 101 out
R2(config-if)#int g0/1
R2(config-if)#ip access-group 101 out
R2(config-if)#
```

12. Verificar procesos de comunicación y redireccionamiento de tráfico en los routers mediante el uso de Ping y Traceroute.



```
R2
Physical Config CLI Attributes
IOS Command Line Interface
R2(config)#access-list 101 permit icmp any any echo-reply
R2(config)#int g0/0
R2(config-if)#ip access-group 101 in
R2(config-if)#int s0/0/0
R2(config-if)#ip access-group 101 out
R2(config-if)#int s0/0/1
R2(config-if)#ip access-group 101
% Incomplete command.
R2(config-if)#ip access-group 101 out
R2(config-if)#int #0/1
%Invalid interface type and number
R2(config)#int g0/1
R2(config-if)#ip access-group 101 out
R2(config-if)#end
R2#
%SYS-5-CONFIG_I: Configured from console by console

R2#show access-list
Standard IP access list 1
 10 permit 192.168.30.0 0.0.0.255
 20 permit 192.168.40.0 0.0.0.255
Standard IP access list ADMIN_S
 10 permit host 172.31.21.1
Extended IP access list 101
 10 permit tcp any host 209.165.200.229 eq www
 20 permit icmp any any echo-reply
R2#
```

CONCLUSIÓN

Mediante la realización de este trabajo se exploraron los distintos conocimientos obtenidos en el modulo de redes ciscos, practicamos con los dos escenarios las configuraciones que deben realizarse en los dispositivos de red para lograr una conectividad estable, el ejercicio nos permitió realizar configuraciones planteadas de manera errónea a fin de poder encontrar la solución optima para las configuraciones, pusimos en práctica la configuración y conexión de diferentes dispositivos entre ellos el Reuter 1941 para conectar varias redes.

BIBLIOGRAFÍA

- Temática: Capa de Aplicación CISCO. (2014). Capa de Aplicación. Fundamentos de Networking. Recuperado de: <https://static-course-assets.s3.amazonaws.com/ITN50ES/module10/index.html#10.0.1.1>
- Felipe, J. (2012). Juan Felipe. <https://youtu.be/OSACL0bLjY> (Compositor). (2013). configuracion de red con dos routers packet tracer.
- CISCO. (2014). Configuración y conceptos básicos de Switching. Principios de Enrutamiento y Conmutación. Recuperado de <https://static-course-assets.s3.amazonaws.com/RSE50ES/module2/index.html#2.0.1.1>