

# PRUEBA DE HABILIDADES PRÁCTICAS

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TRABAJO DE GRADO PARA OBTENER  
EL TITULO DE INGENIERO

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## RESUMEN

El diplomado de Profundización CCNA presento la evaluación prueba de habilidades, pone a disposición una muestra del conocimiento adquirido atraves de los conocimientos estudiados, por medio de esta practica se identifica la importancia de las telecomunicaciones en nuestro mundo actual, en el diario vivir el entorno y para un uso practico que genera desarrollo de la información.

Palabras Clave: Enrutamiento, Red, Routers.

## INTRODUCCIÓN

La evaluación denominada “Prueba de habilidades prácticas”, forma parte de las actividades evaluativas del Diplomado de Profundización CCNA, y busca identificar el grado de desarrollo de competencias y habilidades que fueron adquiridas a lo largo del diplomado. Lo esencial es poner a prueba los niveles de comprensión y solución de problemas relacionados con diversos aspectos de Networking.

A continuación, se elaboran dos escenarios correspondientes a la temática de implementación de soluciones soportadas en enrutamiento avanzado como etapa final del curso Diplomado de Profundización CCNA.

## OBJETIVOS

### OBJETIVO GENERAL

Aplicar los conocimientos adquiridos en el diplomado de profundización CCNA

### OBJETIVOS ESPECIFICOS

Identificar la solución para aplicar en los casos expuestos en el diplomado.

Implementar los procesos en enrutamiento avanzado.

Comprender la solución de los problemas relacionados al Networking.

## DESARROLLO DE LOS ESCENARIOS

### ESCENARIO 1

Este escenario plantea el uso de RIP como protocolo de enrutamiento, considerando que se tendran rutas por defecto redistribuidas; asimismo, habilitar el encapsulamiento PPP y su autenticación.

Los routers Bogota2 y medellin2 proporcionan el servicio DHCP a su propia red LAN y a los routers 3 de cada ciudad.

Debe configurar PPP en los enlaces hacia el ISP, con autenticación.

Debe habilitar NAT de sobrecarga en los routers Bogota1 y medellin1.

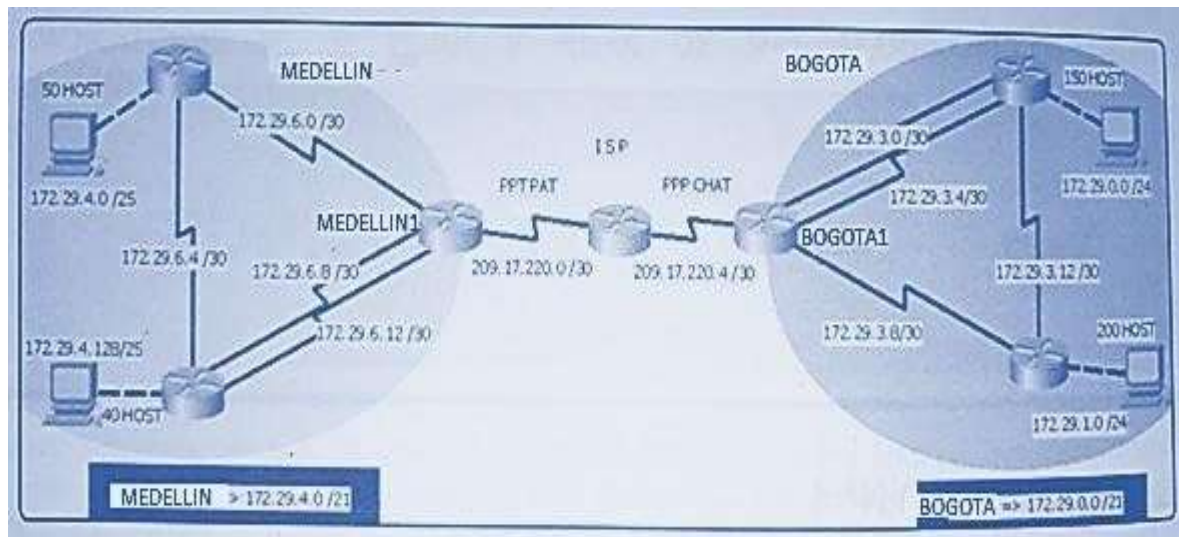


Figura 1.



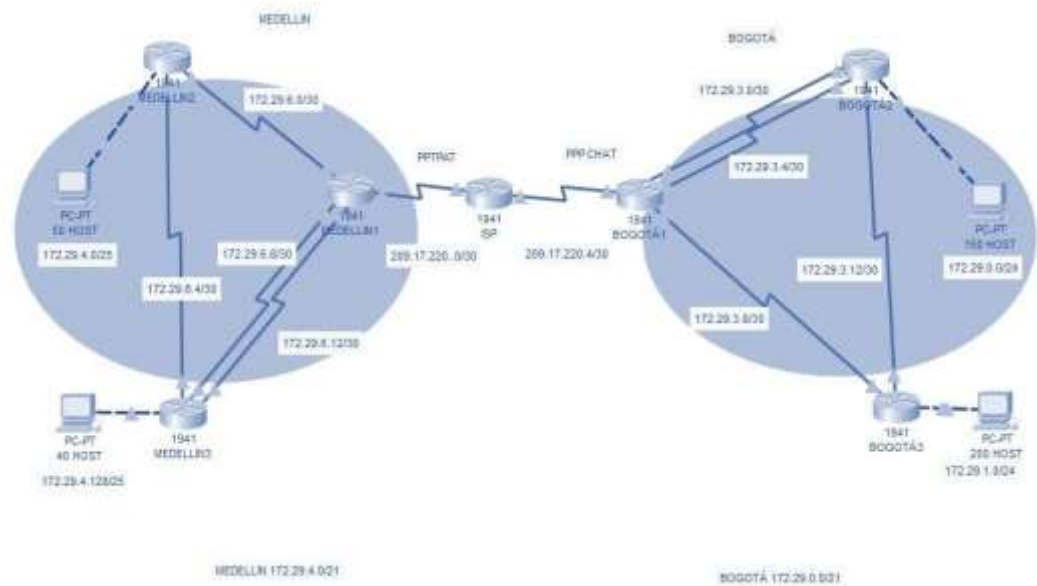


Figura 2.

### ROUTER RIP V2 MEDELLIN 3

```
MEDELLIN3(config)#router rip
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)#version 2
MEDELLIN3(config-router)#noauto-summary
```

### ROUTER RIP V2 MEDELLIN 2

```
MEDELLIN2(config)#router rip
MEDELLIN2(config-router)#network 172.29.4.0
MEDELLIN2(config-router)#network 172.29.6.4
MEDELLIN2(config-router)#network 172.29.6.0
MEDELLIN2(config-router)#version 2
MEDELLIN2(config-router)#noauto-summary
```

### **ROUTER RIP V2 MEDELLIN 1**

```
MEDELLIN1(config)#router rip 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)#version 2 MEDELLIN1(config-router)#noauto-summary
```

### **ROUTER RIP V2 BOGOTA3**

```
BOGOTA3(config)#router rip BOGOTA3(config-router)#network 172.29.1.0
BOGOTA3(config-router)#network 172.29.3.8
BOGOTA3(config-router)#network 172.29.3.12
BOGOTA3(config-router)#version 2 BOGOTA3(config-router)#no auto-summary
```

### **ROUTER RIP V2 BOGOTA2**

```
BOGOTA2(config)#router rip BOGOTA2(config-router)#network 172.29.3.0
BOGOTA2(config-router)#network 172.29.3.4
BOGOTA2(config-router)#network 172.29.3.12
BOGOTA2(config-router)#network 172.29.0.0
BOGOTA2(config-router)#version 2 BOGOTA2(config-router)#no auto-summary
```

### **ROUTER RIP V2 BOGOTA1**

```
BOGOTA1(config)#router rip 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)#version 2 BOGOTA1(config-router)#no auto-summary
```

### **MEDELLIN1**

```
MEDELLIN1(config)#ip route 0.0.0.0 0.0.0.0 s0/0/1
```

### **BOGOTA1**

```
BOGOTA1(config)#ip route 0.0.0.0 0.0.0.0 s0/0/0
```

### **ISP**

```
ISP(config)#ip route 209.17.220.0 255.255.255.252 209.17.220.2
ISP(config)#ip route 209.17.220.4 255.255.255.252 209.17.220.6
ISP(config)#router rip
ISP(config-router)#network 209.17.220.0
ISP(config-router)#network 209.17.220.4
ISP(config-router)#version 2 ISP(config-router)#redistribute static
```

### **ROUTER MEDELLIN3**

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 interarea  
\* - 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, 8 subnets, 3 masks  
R172.29.4.0/25 [120/1] via 172.29.6.6, 00:00:17, Serial0/0/1  
R172.29.6.0/30 [120/1] via 172.29.6.10, 00:00:00, Serial0/1/0  
                  [120/1] via 172.29.6.6, 00:00:17, Serial0/0/1  
                  [120/1] via 172.29.6.14, 00:00:00, Serial0/1/1  
C 172.29.6.4/30 is directly connected, Serial0/0/1  
L172.29.6.5/32 is directly connected, Serial0/0/1  
C172.29.6.8/30 is directly connected, Serial0/1/0  
L172.29.6.9/32 is directly connected, Serial0/1/0  
C172.29.6.12/30 is directly connected, Serial0/1/1  
L172.29.6.13/32 is directly connected, Serial0/1/1

### **ROUTER MEDELLIN2**

MEDELLIN2#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 interarea  
\* - 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, 8 subnets, 3 masks  
C172.29.4.0/25 is directly connected, GigabitEthernet0/0

L172.29.4.1/32 is directly connected, GigabitEthernet0/0  
 C 172.29.6.0/30 is directly connected, Serial0/0/0  
 L172.29.6.2/32 is directly connected, Serial0/0/0  
 C172.29.6.4/30 is directly connected, Serial0/0/1  
 L172.29.6.6/32 is directly connected, Serial0/0/1  
 R 172.29.6.8/30 [120/1] via 172.29.6.5, 00:00:02, Serial0/0/1  
     [120/1] via 172.29.6.1, 00:00:10, Serial0/0/0  
 R 172.29.6.12/30 [120/1] via 172.29.6.5, 00:00:02, Serial0/0/1  
     [120/1] via 172.29.6.1, 00:00:10, Serial0/0/0

## **ROUTER MEDELLIN1**

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 interarea  
         \* - candidate default, U - per-user static route, o - ODR  
         P - periodic downloaded static route

Gateway of last resort is 0.0.0.0 to network 0.0.0.0

172.29.0.0/16 is variably subnetted, 8 subnets, 3 masks

R172.29.4.0/25 [120/1] via 172.29.6.2, 00:00:04, Serial0/0/0  
 C172.29.6.0/30 is directly connected, Serial0/0/0  
 L172.29.6.1/32 is directly connected, Serial0/0/0  
 R172.29.6.4/30 [120/1] via 172.29.6.13, 00:00:08, Serial0/1/1  
     [120/1] via 172.29.6.9, 00:00:08, Serial0/1/0  
     [120/1] via 172.29.6.2, 00:00:04, Serial0/0/0  
 C172.29.6.8/30 is directly connected, Serial0/1/0  
 L172.29.6.10/32 is directly connected, Serial0/1/0  
 C172.29.6.12/30 is directly connected, Serial0/1/1  
 L172.29.6.14/32 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, Serial0/0/1  
 L 209.17.220.2/32 is directly connected, Serial0/0/1  
 S\* 0.0.0.0/0 is directly connected, Serial0/0/1

### **ROUTER BOGOTA3**

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 interarea  
\* - 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, 2 masks  
R172.29.3.0/30 [120/1] via 172.29.3.9, 00:00:04, Serial0/1/1  
                  [120/1] via 172.29.3.13, 00:00:09, Serial0/0/0  
R172.29.3.4/30 [120/1] via 172.29.3.9, 00:00:04, Serial0/1/1  
                  [120/1] via 172.29.3.13, 00:00:09, Serial0/0/0  
C172.29.3.8/30 is directly connected, Serial0/1/1  
L172.29.3.10/32 is directly connected, Serial0/1/1  
C172.29.3.12/30 is directly connected, Serial0/0/0  
L172.29.3.14/32 is directly connected, Serial0/0/0

### **ROUTER BOGOTA2**

BOGOTA2#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 interarea  
\* - 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, 7 subnets, 2 masks  
C 172.29.3.0/30 is directly connected, Serial0/0/1  
L172.29.3.1/32 is directly connected, Serial0/0/1  
C172.29.3.4/30 is directly connected, Serial0/1/0

L 172.29.3.5/32 is directly connected, Serial0/1/0  
R172.29.3.8/30 [120/1] via 172.29.3.14, 00:00:12, Serial0/0/0  
    [120/1] via 172.29.3.2, 00:00:02, Serial0/0/1  
    [120/1] via 172.29.3.6, 00:00:02, Serial0/1/0  
C 172.29.3.12/30 is directly connected, Serial0/0/0  
L 172.29.3.13/32 is directly connected, Serial0/0/0

### **ROUTER BOGOTA1**

BOGOTA1#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 interarea  
\* - candidate default, U - per-user static route, o - ODR  
P - periodic downloaded static route

Gateway of last resort is 0.0.0.0 to network 0.0.0.0

172.29.0.0/16 is variably subnetted, 7 subnets, 2 masks  
C 172.29.3.0/30 is directly connected, Serial0/0/1  
L 172.29.3.2/32 is directly connected, Serial0/0/1  
C 172.29.3.4/30 is directly connected, Serial0/1/0  
L 172.29.3.6/32 is directly connected, Serial0/1/0  
C 172.29.3.8/30 is directly connected, Serial0/1/1  
L 172.29.3.9/32 is directly connected, Serial0/1/1  
R 172.29.3.12/30 [120/1] via 172.29.3.5, 00:00:09, Serial0/1/0  
    [120/1] via 172.29.3.1, 00:00:09, Serial0/0/1  
    [120/1] via 172.29.3.10, 00:00:13, Serial0/1/1  
209.17.220.0/24 is variably subnetted, 2 subnets, 2 masks  
C 209.17.220.4/30 is directly connected, Serial0/0/0  
L209.17.220.6/32 is directly connected, Serial0/0/0  
S\* 0.0.0.0/0 is directly connected, Serial0/0/0

### **ROUTER ISP**

ISP#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 interarea  
\* - candidate default, U - per-user static route, o - ODR  
P - periodic downloaded static route

Gateway of last resort is not set

209.17.220.0/24 is variably subnetted, 4 subnets, 2 masks  
C 209.17.220.0/30 is directly connected, Serial0/0/1  
L 209.17.220.1/32 is directly connected, Serial0/0/1  
C209.17.220.4/30 is directly connected, Serial0/0/0  
L 209.17.220.5/32 is directly connected, Serial0/0/0

MEDELLIN3(config-router)#passive-interfaces0/0/0  
MEDELLIN2(config-router)#passive-interface s0/1/0  
MEDELLIN2(config-router)#passive-interface s0/1/1  
MEDELLIN1(config-router)#passive-interface s0/0/1  
BOGOTA3(config-router)#passive-interface s0/0/1  
BOGOTA3(config-router)#passive-interface s0/1/0  
BOGOTA2(config-router)#passive-interface s0/1/1  
BOGOTA1(config-router)#passive-interface s0/0/0

### **ROUTER MEDELLIN3**

MEDELLIN3#show ip int  
GigabitEthernet0/0 is up, line protocol is up (connected)  
Internet protocol processing disabled  
GigabitEthernet0/1 is administratively down, line protocol is down (disabled)  
Internet protocol processing disabled  
Serial0/0/0 is administratively down, line protocol is down (disabled)  
Internet protocol processing disabled  
Serial0/0/1 is up, line protocol is up (connected)  
Internet address is 172.29.6.5/30  
Broadcast address is 255.255.255.255  
Address determined by setup command  
MTU is 1500  
Helper address is not set  
Directed broadcast forwarding is disabled

Outgoing access list is not set Inbound access list is not set  
Proxy ARP is enabled  
Security level is default  
Split horizon is enabled  
ICMP redirects are always sent  
ICMP unreachable are always sent  
ICMP mask replies are never sent

IP fast switching is disabled  
IP fast switching on the same interface is disabled  
IP Flow switching is disabled  
IP Fast switching turbo vector  
IP multicast fast switching is disabled  
IP multicast distributed fast switching is disabled  
Router Discovery is disabled  
IP output packet accounting is disabled  
IP access violation accounting is disabled  
TCP/IP header compression is disabled  
RTP/IP header compression is disabled  
Probe proxy name replies are disabled  
Policy routing is disabled  
Network address translation is disabled  
WCCP Redirect outbound is disabled  
WCCP Redirect exclude is disabled  
BGP Policy Mapping is disabled  
Serial0/1/0 is up, line protocol is up (connected)  
Internet address is 172.29.6.9/30  
Broadcast address is 255.255.255.255  
Address determined by setup command  
MTU is 1500  
Helper address is not set  
Directed broadcast forwarding is disabled  
Outgoing access list is not set  
Inbound access list is not set Proxy  
ARP is enabled  
Security level is default  
Split horizon is enabled  
ICMP redirects are always sent



ICMP unreachable are always sent  
ICMP mask replies are never sent

IP fast switching is disabled  
IP fast switching on the same interface is disabled  
IP Flow switching is disabled  
IP Fast switching turbo vector  
IP multicast fast switching is disabled  
IP multicast distributed fast switching is disabled  
Router Discovery is disabled  
IP output packet accounting is disabled  
IP access violation accounting is disabled  
TCP/IP header compression is disabled  
RTP/IP header compression is disabled  
Probe proxy name replies are disabled  
Policy routing is disabled  
Network address translation is disabled  
WCCP Redirect outbound is disabled  
WCCP Redirect exclude is disabled  
BGP Policy Mapping is disabled  
Serial0/1/1 is up, line protocol is up (connected)  
Internet address is 172.29.6.13/30  
Broadcast address is 255.255.255.255  
Address determined by setup command  
MTU is 1500  
Helper address is not set  
Directed broadcast forwarding is disabled  
Outgoing access list is not set  
Inbound access list is not set  
Proxy ARP is enabled  
Security level is default  
Split horizon is enabled  
ICMP redirects are always sent  
ICMP unreachable are always sent  
ICMP mask replies are never sent

IP fast switching is disabled  
IP fast switching on the same interface is disabled  
IP Flow switching is disabled  
IP Fast switching turbo vector  
IP multicast fast switching is disabled  
IP multicast distributed fast switching is disabled  
Router Discovery is disabled  
IP output packet accounting is disabled  
IP access violation accounting is disabled  
TCP/IP header compression is disabled  
RTP/IP header compression is disabled  
Probe proxy name replies are disabled  
Policy routing is disabled  
Network address translation is disabled  
WCCP Redirect outbound is disabled  
WCCP Redirect exclude is disabled  
BGP Policy Mapping is disabled  
Vlan1 is administratively down, line protocol is down  
Internet protocol processing disabled

## **ROUTER MEDELLIN2**

```
MEDELLIN2#show ip int
GigabitEthernet0/0 is up,line protocol is up (connected)
Internet address is 172.29.4.1/25
Broadcast address is 255.255.255.255
Address determined by setup command
MTU is 1500 bytes
Helper address is not set
Directed broadcast forwarding is disabled
Outgoing access list is not set
Inbound access list is not set
Proxy ARP is enabled
Security level is default
Split horizon is enabled
ICMP redirects are always sent
ICMP unreachable are always sent
ICMP mask replies are never sent
```

IP fast switching is disabled  
IP fast switching on the same interface is disabled  
IP Flow switching is disabled  
IP Fast switching turbo vector  
IP multicast fast switching is disabled  
IP multicast distributed fast switching is disabled  
Router Discovery is disabled  
IP output packet accounting is disabled  
IP access violation accounting is disabled  
TCP/IP header compression is disabled  
RTP/IP header compression is disabled  
Probe proxy name replies are disabled  
Policy routing is disabled  
Network address translation is disabled  
BGP Policy Mapping is disabled  
Input features: MCI Check  
WCCP Redirect outbound is disabled  
WCCP Redirect inbound is disabled  
WCCP Redirect exclude is disabled  
GigabitEthernet0/1 is administratively down, line protocol is down (disabled)  
Internet protocol processing disabled  
Serial0/0/0 is up, line protocol is up (connected)  
Internet address is 172.29.6.2/30  
Broadcast address is 255.255.255.255  
Address determined by setup command  
MTU is 1500  
Helper address is not set  
Directed broadcast forwarding is disabled  
Outgoing access list is not set  
Inbound access list is not set Proxy  
ARP is enabled  
Security level is default  
Split horizon is enabled  
ICMP redirects are always sent  
ICMP unreachable are always sent  
ICMP mask replies are never sent

IP fast switching is disabled  
IP fast switching on the same interface is disabled  
IP Flow switching is disabled  
IP Fast switching turbo vector  
IP multicast fast switching is disabled  
IP multicast distributed fast switching is disabled  
Router Discovery is disabled  
IP output packet accounting is disabled  
IP access violation accounting is disabled  
TCP/IP header compression is disabled  
RTP/IP header compression is disabled  
Probe proxy name replies are disabled  
Policy routing is disabled  
Network address translation is disabled  
WCCP Redirect outbound is disabled  
WCCP Redirect exclude is disabled  
BGP Policy Mapping is disabled  
Serial0/0/1 is up, line protocol is up (connected)  
Internet address is 172.29.6.6/30  
Broadcast address is 255.255.255.255  
Address determined by setup command  
MTU is 1500  
Helper address is not set  
Directed broadcast forwarding is disabled  
Outgoing access list is not set  
Inbound access list is not set  
Proxy ARP is enabled  
Security level is default  
Split horizon is enabled  
ICMP redirects are always sent  
ICMP unreachable are always sent  
ICMP mask replies are never sent

IP fast switching is disabled  
IP fast switching on the same interface is disabled  
IP Flow switching is disabled  
IP Fast switching turbo vector  
IP multicast fast switching is disabled  
IP multicast distributed fast switching is disabled  
Router Discovery is disabled  
IP output packet accounting is disabled  
IP access violation accounting is disabled  
TCP/IP header compression is disabled  
RTP/IP header compression is disabled  
Probe proxy name replies are disabled  
Policy routing is disabled  
Network address translation is disabled  
WCCP Redirect outbound is disabled  
WCCP Redirect exclude is disabled  
BGP Policy Mapping is disabled  
Serial0/1/0 is administratively down, line protocol is down (disabled)  
Internet protocol processing disabled  
Serial0/1/1 is administratively down, line protocol is down (disabled)  
Internet protocol processing disabled  
Vlan1 is administratively down, line protocol is down  
Internet protocol processing disabled

### **ROUTER MEDELLIN1**

MEDELLIN1#show ip int  
GigabitEthernet0/0 is administratively down, line protocol is down (disabled)  
Internet protocol processing disabled  
GigabitEthernet0/1 is administratively down, line protocol is down (disabled)  
Internet protocol processing disabled  
Serial0/0/0 is up, line protocol is up (connected)  
Internet address is 172.29.6.1/30  
Broadcast address is 255.255.255.255  
Address determined by setup command is 1500  
Helper address is not set  
Directed broadcast forwarding is disabled  
Outgoing access list is not set  
Inbound access list is not set

Proxy ARP is enabled  
Security level is default  
Split horizon is enabled  
ICMP redirects are always sent  
ICMP unreachable are always sent  
ICMP mask replies are never sent

IP fast switching is disabled  
IP fast switching on the same interface is disabled  
IP Flow switching is disabled  
IP Fast switching turbo vector  
IP multicast fast switching is disabled  
IP multicast distributed fast switching is disabled  
Router Discovery is disabled  
IP output packet accounting is disabled  
IP access violation accounting is disabled  
TCP/IP header compression is disabled  
RTP/IP header compression is disabled  
Probe proxy name replies are disabled  
Policy routing is disabled  
Network address translation is disabled  
WCCP Redirect outbound is disabled  
WCCP Redirect exclude is disabled  
BGP Policy Mapping is disabled  
Serial0/0/1 is up, line protocol is up (connected)  
Internet address is 209.17.220.2/30  
Broadcast address is 255.255.255.255  
Address determined by setup command  
MTU is 1500  
Helper address is not set  
Directed broadcast forwarding is disabled  
Outgoing access list is not set  
Inbound access list is not set  
Proxy ARP is enabled  
Security level is default  
Split horizon is enabled  
ICMP redirects are always sent  
ICMP unreachable are always sent

ICMP mask replies are never sent  
IP fast switching is disabled  
IP fast switching on the same interface is disabled  
IP Flow switching is disabled  
IP Fast switching turbo vector  
IP multicast fast switching is disabled  
IP multicast distributed fast switching is disabled  
Router Discovery is disabled  
IP output packet accounting is disabled  
IP access violation accounting is disabled  
TCP/IP header compression is disabled  
RTP/IP header compression is disabled  
Probe proxy name replies are disabled  
Policy routing is disabled  
Network address translation is disabled  
WCCP Redirect outbound is disabled  
WCCP Redirect exclude is disabled  
BGP Policy Mapping is disabled  
Serial0/1/0 is up, line protocol is up (connected)  
Internet address is 172.29.6.10/30  
Broadcast address is 255.255.255.255  
Address determined by setup command  
MTU is 1500  
Helper address is not set  
Directed broadcast forwarding is disabled  
Outgoing access list is not set  
Inbound access list is not set  
Proxy ARP is enabled  
Security level is default  
Split horizon is enabled  
ICMP redirects are always sent  
ICMP unreachable are always sent  
ICMP mask replies are never sent

IP fast switching is disabled  
IP fast switching on the same interface is disabled  
IP Flow switching is disabled  
IP Fast switching turbo vector

IP multicast fast switching is disabled  
IP multicast distributed fast switching is disabled  
Router Discovery is disabled  
IP output packet accounting is disabled  
IP access violation accounting is disabled  
TCP/IP header compression is disabled  
RTP/IP header compression is disabled  
Probe proxy name replies are disabled  
Policy routing is disabled  
Network address translation is disabled  
WCCP Redirect outbound is disabled  
WCCP Redirect exclude is disabled  
BGP Policy Mapping is disabled  
Serial0/1/1 is up, line protocol is up (connected)  
Internet address is 172.29.6.14/30  
Broadcast address is 255.255.255.255  
Address determined by setup command  
MTU is 1500  
Helper address is not set  
Directed broadcast forwarding is disabled  
Outgoing access list is not set  
Inbound access list is not set  
Proxy ARP is enabled  
Security level is default  
Split horizon is enabled  
ICMP redirects are always sent  
ICMP unreachable are always sent  
ICMP mask replies are never sent

IP fast switching is disabled  
IP fast switching on the same interface is disabled  
IP Flow switching is disabled  
IP Fast switching turbo vector  
IP multicast fast switching is disabled  
IP multicast distributed fast switching is disabled  
Router Discovery is disabled  
IP output packet accounting is disabled  
IP access violation accounting is disabled



TCP/IP header compression is disabled  
RTP/IP header compression is disabled  
Probe proxy name replies are disabled  
Policy routing is disabled  
Network address translation is disabled  
WCCP Redirect outbound is disabled  
WCCP Redirect exclude is disabled  
BGP Policy Mapping is disabled  
Vlan1 is administratively down, line protocol is down  
Internet protocol processing disabled

### **ROUTER BOGOTA3**

BOGOTA3#show ip int  
GigabitEthernet0/0 is up, line protocol is up (connected)  
Internet protocol processing disabled  
GigabitEthernet0/1 is administratively down, line protocol is down (disabled)  
Internet protocol processing disabled  
Serial0/0/0 is up, line protocol is up (connected)  
Internet address is 172.29.3.14/30  
Broadcast address is 255.255.255.255  
Address determined by setup command  
MTU is 1500  
Helper address is not set  
Directed broadcast forwarding is disabled  
Outgoing access list is not set  
Inbound access list is not set  
Proxy ARP is enabled  
Security level is default  
Split horizon is enabled  
ICMP redirects are always sent  
ICMP unreachable are always sent  
ICMP mask replies are never sent

IP fast switching is disabled  
IP fast switching on the same interface is disabled  
IP Flow switching is disabled  
IP Fast switching turbo vector  
IP multicast fast switching is disabled

IP multicast distributed fast switching is disabled  
Router Discovery is disabled  
IP output packet accounting is disabled  
IP access violation accounting is disabled  
TCP/IP header compression is disabled  
RTP/IP header compression is disabled  
Probe proxy name replies are disabled  
Policy routing is disabled  
Network address translation is disabled  
WCCP Redirect outbound is disabled  
WCCP Redirect exclude is disabled  
BGP Policy Mapping is disabled  
Serial0/0/1 is administratively down, line protocol is down (disabled)  
Internet protocol processing disabled  
Serial0/1/0 is administratively down, line protocol is down (disabled)  
Internet protocol processing disabled  
Serial0/1/1 is up, line protocol is up (connected)  
Internet address is 172.29.3.10/30  
Broadcast address is 255.255.255.255  
Address determined by setup command  
MTU is 1500  
Helper address is not set  
Directed broadcast forwarding is disabled  
Outgoing access list is not set  
Inbound access list is not set  
Proxy ARP is enabled  
Security level is default  
Split horizon is enabled  
ICMP redirects are always sent  
ICMP unreachable are always sent  
ICMP mask replies are never sent

IP fast switching is disabled  
IP fast switching on the same interface is disabled  
IP Flow switching is disabled  
IP Fast switching turbo vector  
IP multicast fast switching is disabled  
IP multicast distributed fast switching is disabled

Router Discovery is disabled  
IP output packet accounting is disabled  
IP access violation accounting is disabled  
TCP/IP header compression is disabled  
RTP/IP header compression is disabled  
Probe proxy name replies are disabled  
Policy routing is disabled  
Network address translation is disabled  
WCCP Redirect outbound is disabled  
WCCP Redirect exclude is disabled  
BGP Policy Mapping is disabled  
Vlan1 is administratively down, line protocol is down  
Internet protocol processing disabled

## **ROUTER BOGOTA2**

```
BOGOTA2#show ip int
GigabitEthernet0/0 is up, line protocol is up (connected)
Internet protocol processing disabled
GigabitEthernet0/1 is administratively down, line protocol is down (disabled)
Internet protocol processing disabled
Serial0/0/0 is up, line protocol is up (connected)
Internet address is 172.29.3.13/30
Broadcast address is 255.255.255.255
Address determined by setup command
MTU is 1500
Helper address is not set
Directed broadcast forwarding is disabled
Outgoing access list is not set
Inbound access list is not set
Proxy ARP is enabled
Security level is default
Split horizon is enabled
ICMP redirects are always sent
ICMP unreachable are always sent
ICMP mask replies are never sent
```

IP fast switching is disabled  
IP fast switching on the same interface is disabled  
IP Flow switching is disabled  
IP Fast switching turbo vector  
IP multicast fast switching is disabled  
IP multicast distributed fast switching is disabled  
Router Discovery is disabled  
IP output packet accounting is disabled  
IP access violation accounting is disabled  
TCP/IP header compression is disabled  
RTP/IP header compression is disabled  
Probe proxy name replies are disabled  
Policy routing is disabled  
Network address translation is disabled  
WCCP Redirect outbound is disabled  
WCCP Redirect exclude is disabled  
BGP Policy Mapping is disabled  
Serial0/0/1 is up, line protocol is up (connected)  
Internet address is 172.29.3.1/30  
Broadcast address is 255.255.255.255  
Address determined by setup command  
MTU is 1500  
Helper address is not set  
Directed broadcast forwarding is disabled  
Outgoing access list is not set  
Inbound access list is not set  
Proxy ARP is enabled  
Security level is default  
Split horizon is enabled  
ICMP redirects are always sent  
ICMP unreachable are always sent  
ICMP mask replies are never sent

IP fast switching is disabled  
IP fast switching on the same interface is disabled  
IP Flow switching is disabled  
IP Fast switching turbo vector  
IP multicast fast switching is disabled

IP multicast distributed fast switching is disabled  
Router Discovery is disabled  
IP output packet accounting is disabled  
IP access violation accounting is disabled  
TCP/IP header compression is disabled  
RTP/IP header compression is disabled  
Probe proxy name replies are disabled  
Policy routing is disabled  
Network address translation is disabled  
WCCP Redirect outbound is disabled  
WCCP Redirect exclude is disabled  
BGP Policy Mapping is disabled  
Serial0/1/0 is up, line protocol is up (connected)  
Internet address is 172.29.3.5/30  
Broadcast address is 255.255.255.255  
Address determined by setup command  
MTU is 1500  
Helper address is not set  
Directed broadcast forwarding is disabled  
Outgoing access list is not set  
Inbound access list is not set  
Proxy ARP is enabled  
Security level is default  
Split horizon is enabled  
ICMP redirects are always sent  
ICMP unreachable are always sent  
ICMP mask replies are never sent

IP fast switching is disabled  
IP fast switching on the same interface is disabled  
IP Flow switching is disabled  
IP Fast switching turbo vector  
IP multicast fast switching is disabled  
IP multicast distributed fast switching is disabled  
Router Discovery is disabled  
IP output packet accounting is disabled  
IP access violation accounting is disabled  
TCP/IP header compression is disabled

RTP/IP header compression is disabled  
Probe proxy name replies are disabled  
Policy routing is disabled  
Network address translation is disabled  
WCCP Redirect outbound is disabled  
WCCP Redirect exclude is disabled  
BGP Policy Mapping is disabled  
Serial0/1/1 is administratively down, line protocol is down (disabled)  
Internet protocol processing disabled  
Vlan1 is administratively down, line protocol is down Internet protocol processing disabled

### **ROUTER BOGOTA1**

BOGOTA1#show ip int  
GigabitEthernet0/0 is administratively down, line protocol is down (disabled)  
Internet protocol processing disabled  
GigabitEthernet0/1 is administratively down, line protocol is down (disabled)  
Internet protocol processing disabled  
Serial0/0/0 is up, line protocol is up (connected)  
Internet address is 209.17.220.6/30  
Broadcast address is 255.255.255.255  
Address determined by setup command  
MTU is 1500  
Helper address is not set  
Directed broadcast forwarding is disabled  
Outgoing access list is not set  
Inbound access list is not set  
Proxy ARP is enabled  
Security level is default  
Split horizon is enabled  
ICMP redirects are always sent  
ICMP unreachable are always sent  
ICMP mask replies are never sent

IP fast switching is disabled  
IP fast switching on the same interface is disabled  
IP Flow switching is disabled  
IP Fast switching turbo vector

IP multicast fast switching is disabled  
IP multicast distributed fast switching is disabled  
Router Discovery is disabled  
IP output packet accounting is disabled  
IP access violation accounting is disabled  
TCP/IP header compression is disabled  
RTP/IP header compression is disabled  
Probe proxy name replies are disabled  
Policy routing is disabled  
Network address translation is disabled  
WCCP Redirect outbound is disabled  
WCCP Redirect exclude is disabled  
BGP Policy Mapping is disabled  
Serial0/0/1 is up, line protocol is up (connected)  
  Internet address is 172.29.3.2/30  
  Broadcast address is 255.255.255.255  
  Address determined by setup command  
  MTU is 1500  
  Helper address is not set  
  Directed broadcast forwarding is disabled  
  Outgoing access list is not set  
  Inbound access list is not set  
  Proxy ARP is enabled  
  Security level is default  
  Split horizon is enabled  
  ICMP redirects are always sent  
  ICMP unreachable are always sent  
  ICMP mask replies are never sent

IP fast switching is disabled  
IP fast switching on the same interface is disabled  
IP Flow switching is disabled  
IP Fast switching turbo vector  
IP multicast fast switching is disabled  
IP multicast distributed fast switching is disabled  
Router Discovery is disabled  
IP output packet accounting is disabled  
IP access violation accounting is disabled

TCP/IP header compression is disabled  
RTP/IP header compression is disabled  
Probe proxy name replies are disabled  
Policy routing is disabled  
Network address translation is disabled  
WCCP Redirect outbound is disabled  
WCCP Redirect exclude is disabled  
BGP Policy Mapping is disabled  
Serial0/1/0 is up, line protocol is up (connected)  
Internet address is 172.29.3.6/30  
Broadcast address is 255.255.255.255  
Address determined by setup command  
MTU is 1500  
Helper address is not set  
Directed broadcast forwarding is disabled  
Outgoing access list is not set  
Inbound access list is not set  
Proxy ARP is enabled  
Security level is default  
Split horizon is enabled  
ICMP redirects are always sent  
ICMP unreachable are always sent  
ICMP mask replies are never sent

IP fast switching is disabled  
IP fast switching on the same interface is disabled  
IP Flow switching is disabled  
IP Fast switching turbo vector  
IP multicast fast switching is disabled  
IP multicast distributed fast switching is disabled  
Router Discovery is disabled  
IP output packet accounting is disabled  
IP access violation accounting is disabled  
TCP/IP header compression is disabled  
RTP/IP header compression is disabled  
Probe proxy name replies are disabled  
Policy routing is disabled  
Network address translation is disabled



WCCP Redirect outbound is disabled  
WCCP Redirect exclude is disabled  
BGP Policy Mapping is disabled  
Serial0/1/1 is up, line protocol is up (connected)  
Internet address is 172.29.3.9/30  
Broadcast address is 255.255.255.255  
Address determined by setup command  
MTU is 1500  
Helper address is not set  
Directed broadcast forwarding is disabled  
Outgoing access list is not set  
Inbound access list is not set  
Proxy ARP is enabled  
Security level is default  
Split horizon is enabled  
ICMP redirects are always sent  
ICMP unreachable are always sent  
ICMP mask replies are never sent

IP fast switching is disabled  
IP fast switching on the same interface is disabled  
IP Flow switching is disabled  
IP Fast switching turbo vector  
IP multicast fast switching is disabled  
IP multicast distributed fast switching is disabled  
Router Discovery is disabled  
IP output packet accounting is disabled  
IP access violation accounting is disabled  
TCP/IP header compression is disabled  
RTP/IP header compression is disabled  
Probe proxy name replies are disabled Policy routing is disabled  
Network address translation is disabled  
WCCP Redirect outbound is disabled  
WCCP Redirect exclude is disabled  
BGP Policy Mapping is disabled  
Vlan1 is administratively down, line protocol is down  
Internet protocol processing disabled

## **ROUTER ISP**

ISP#show ip int

GigabitEthernet0/0 is administratively down, line protocol is down (disabled)

Internet protocol processing disabled

GigabitEthernet0/1 is administratively down, line protocol is down (disabled)

Internet protocol processing disabled

Serial0/0/0 is up, line protocol is up (connected)

Internet address is 209.17.220.5/30 Broadcast address is 255.255.255.255

Address determined by setup command

MTU is 1500

Helper address is not set

Directed broadcast forwarding is disabled

Outgoing access list is not set

Inbound access list is not set

Proxy ARP is enabled

Security level is default

Split horizon is enabled

ICMP redirects are always sent

ICMP unreachable are always sent

ICMP mask replies are never sent

IP fast switching is disabled

IP fast switching on the same interface is disabled

IP Flow switching is disabled

IP Fast switching turbo vector

IP multicast fast switching is disabled

IP multicast distributed fast switching is disabled

Router Discovery is disabled

IP output packet accounting is disabled

IP access violation accounting is disabled

TCP/IP header compression is disabled

RTP/IP header compression is disabled

Probe proxy name replies are disabled

Policy routing is disabled

Network address translation is disabled

WCCP Redirect outbound is disabled

WCCP Redirect exclude is disabled

BGP Policy Mapping is disabled

Serial0/0/1 is up, line protocol is up (connected)  
Internet address is 209.17.220.1/30  
Broadcast address is 255.255.255.255  
Address determined by setup command  
MTU is 1500  
Helper address is not set  
Directed broadcast forwarding is disabled  
Outgoing access list is not set  
Inbound access list is not set  
Proxy ARP is enabled  
Security level is default  
Split horizon is enabled  
ICMP redirects are always sent  
ICMP unreachable are always sent  
ICMP mask replies are never sent  
IP fast switching is disabled  
IP fast switching on the same interface is disabled  
IP Flow switching is disabled  
IP Fast switching turbo vector  
IP multicast fast switching is disabled  
IP multicast distributed fast switching is disabled  
Router Discovery is disabled  
IP output packet accounting is disabled  
IP access violation accounting is disabled  
TCP/IP header compression is disabled  
RTP/IP header compression is disabled  
Probe proxy name replies are disabled  
Policy routing is disabled  
Network address translation is disabled  
WCCP Redirect outbound is disabled  
WCCP Redirect exclude is disabled  
BGP Policy Mapping is disabled  
Serial0/1/0 is administratively down, line protocol is down (disabled)  
Internet protocol processing disabled  
Serial0/1/1 is administratively down, line protocol is down (disabled)  
Internet protocol processing disabled  
Vlan1 is administratively down, line protocol is down  
Internet protocol processing disabled

### **ROUTER MEDELLIN3**

172.29.0.0/16 is variably subnetted, 8 subnets, 3 masks

```
R      172.29.4.0/25 [120/1] via 172.29.6.6, 00:00:19, Serial0/0/1
R      172.29.6.0/30 [120/1] via 172.29.6.10, 00:00:19, Serial0/1/0
      [120/1] via 172.29.6.6, 00:00:19, Serial0/0/1
      [120/1] via 172.29.6.14, 00:00:19, Serial0/1/1
```

### **ROUTER MEDELLIN2**

MEDELLIN2#show ip route rip

172.29.0.0/16 is variably subnetted, 8 subnets, 3 masks

```
R      172.29.6.8/30 [120/1] via 172.29.6.5, 00:00:25, Serial0/0/1
      [120/1] via 172.29.6.1, 00:00:01, Serial0/0/0
R      172.29.6.12/30 [120/1] via 172.29.6.5, 00:00:25, Serial0/0/1
      [120/1] via 172.29.6.1, 00:00:01, Serial0/0/0
```

### **ROUTER MEDELLIN1**

MEDELLIN1#show ip route rip

172.29.0.0/16 is variably subnetted, 8 subnets, 3 masks

```
R      172.29.4.0/25 [120/1] via 172.29.6.2, 00:00:24, Serial0/0/0
R      172.29.6.4/30 [120/1] via 172.29.6.13, 00:00:17, Serial0/1/1
      [120/1] via 172.29.6.9, 00:00:17, Serial0/1/0
      [120/1] via 172.29.6.2, 00:00:24, Serial0/0/0
```

209.17.220.0/24 is variably subnetted, 2 subnets, 2 masks

### **ROUTER BOGOTA3**

BOGOTA3#show ip route rip

172.29.0.0/16 is variably subnetted, 6 subnets, 2 masks

```
R      172.29.3.0/30 [120/1] via 172.29.3.9, 00:00:03, Serial0/1/1
      [120/1] via 172.29.3.13, 00:00:20, Serial0/0/0
R      172.29.3.4/30 [120/1] via 172.29.3.9, 00:00:03, Serial0/1/1
      [120/1] via 172.29.3.13, 00:00:20, Serial0/0/0
```

### **ROUTER BOGOTA2**

BOGOTA2#show ip route rip

172.29.0.0/16 is variably subnetted, 7 subnets, 2 masks

```
R      172.29.3.8/30 [120/1] via 172.29.3.14, 00:00:26, Serial0/0/0
      [120/1] via 172.29.3.2, 00:00:27, Serial0/0/1
      [120/1] via 172.29.3.6, 00:00:27, Serial0/1/0
```

## **ROUTER BOGOTA1**

BOGOTA1#show ip route rip

172.29.0.0/16 is variably subnetted, 7 subnets, 2 masks

```
R      172.29.3.12/30 [120/1] via 172.29.3.10, 00:00:04, Serial0/1/1
      [120/1] via 172.29.3.1, 00:00:23, Serial0/0/1
      [120/1] via 172.29.3.5, 00:00:23, Serial0/1/0
```

209.17.220.0 /24 is variably subnetted, 2 subnets, 2 masks

## 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.

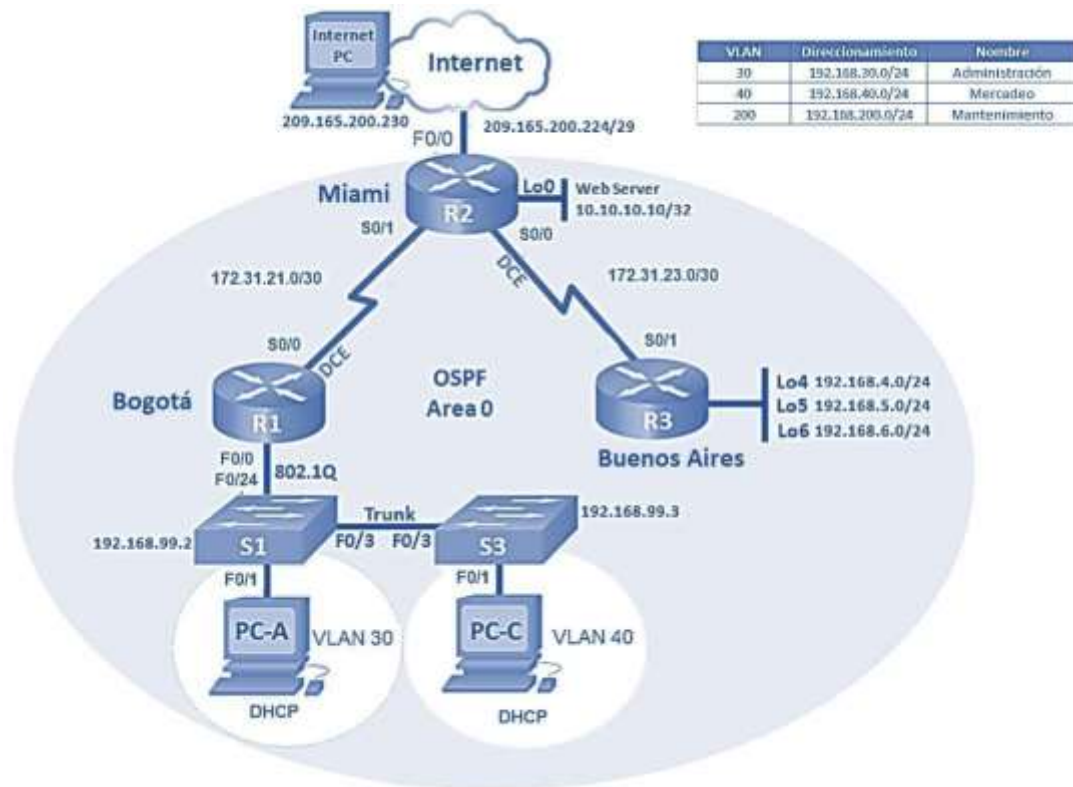


Figura 3.

## CONFIGURACIONES ESCENARIO 2

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

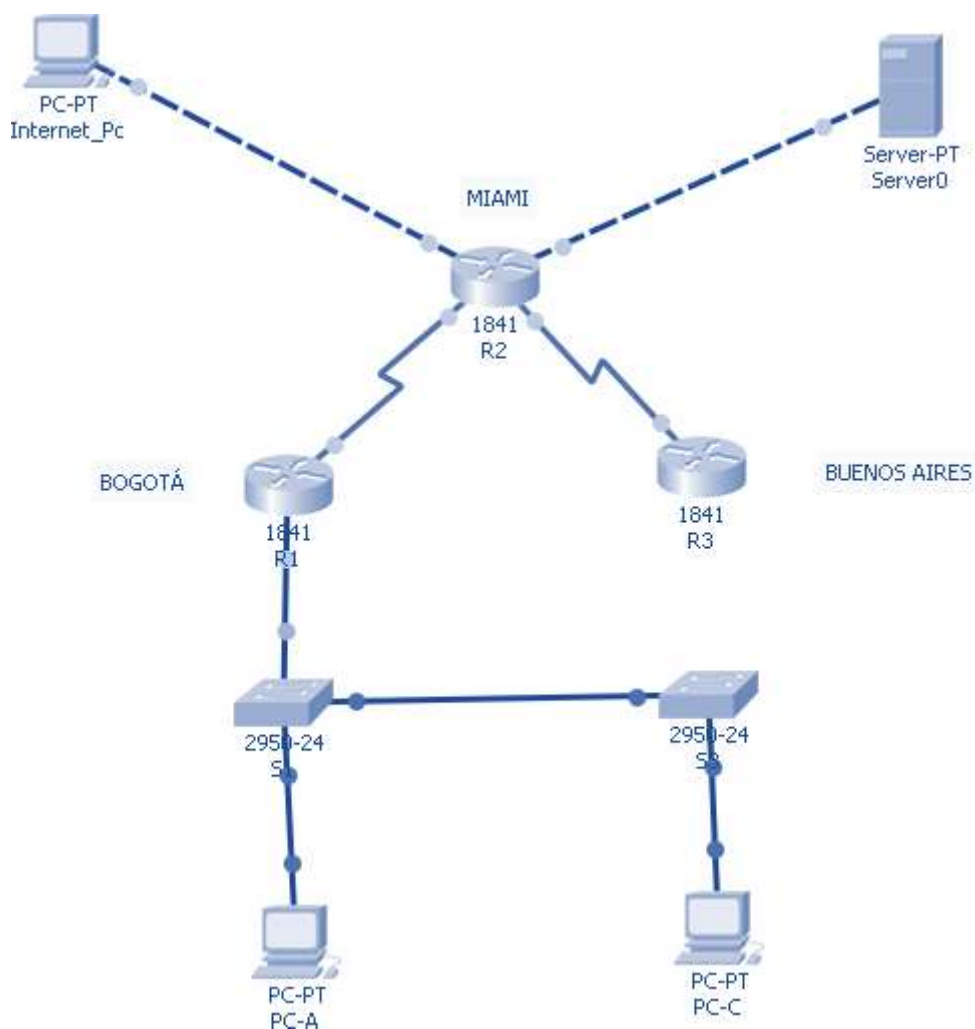


Figura 4.

### **CONFIGURACIÓN BÁSICA R1**

```
Router>en Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname BOGOTA
BOGOTA(config)#no ip domain-lookup
BOGOTA(config)#enable secret class
BOGOTA(config)#line con 0
BOGOTA(config-line)#password cisco
BOGOTA(config-line)#login
BOGOTA(config-line)#exit
BOGOTA(config)#service password-encryption
BOGOTA(config)#banner motd $ Acceso no autorizado o prohibido!! $
BOGOTA(config)#
```

### **CONFIGURACIÓN BÁSICA R2**

```
Router>en Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname MIAMI
MIAMI(config)# no ip domain-lookup
MIAMI(config)#enable secret class
MIAMI(config)#line con 0
MIAMI(config-line)#password cisco
MIAMI(config-line)#login
MIAMI(config-line)#exit
MIAMI(config)#service password-encryption
MIAMI(config)#banner motd $ Acceso no autorizado o prohibido!! $
MIAMI(config)#
```

### **CONFIGURACIÓN BÁSICA R3**

```
Router>enable Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname BUENOSAIRES
BUENOSAIRES(config)#no ip domain-lookup
BUENOSAIRES(config)#enable secret class
BUENOSAIRES(config)#line con 0
BUENOSAIRES(config-line)#password cisco
```



```
BUENOSAIRES(config-line)#login
BUENOSAIRES(config-line)#exit
BUENOSAIRES(config)#service password-encryption
BUENOSAIRES(config)#banner motd $ Acceso no autorizado o prohibido!! $
BUENOSAIRES(config)#
```

### **CONFIGURACIÓN BÁSICA S1**

```
Switch>en Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname S1
S1(config)#no ip domain-lookup
S1(config)#enable secret class
S1(config)#line con 0
S1(config-line)#password cisco
S1(config-line)#login
S1(config-line)#exit
S1(config)#service password-encryption
S1(config)#banner motd $ Solo personal autorizado!! $
S1(config)#
```

### **CONFIGURACIÓN BÁSICA S3**

```
Switch>en Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname S3
S3(config)#no ip domain-lookup
S3(config)#enable secret class
S3(config)#line con 0
S3(config-line)#password cisco
S3(config-line)#login
S3(config-line)#exit
S3(config)#service password-encryption
S3(config)#banner motd $ Solo personal autorizado!! $
S3(config)#
```

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

**OSPFv2 area 0**

<b>Configuration Item or Task</b>	<b>Specification</b>
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

**Verificar información de OSPF**

```

BOGOTA(config)#router ospf 1
BOGOTA(config-router)#router-id 1.1.1.1
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 f0/0.30
BOGOTA(config-router)#passive-interface f0/0.40
BOGOTA(config-router)#passive-interface f0/0.200 BOGOTA(config-router)#
BOGOTA(config)#int s0/0/0 BOGOTA(config-if)#bandwidth 256
BOGOTA(config-if)#ip ospf cost 9500 BOGOTA(config-if)#

```

```

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)#
00:16:21: %OSPF-5-ADJCHG: Process 1, Nbr 1.1.1.1 on Serial0/1/0 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 f0/1
MIAMI(config-router)#exit MIAMI(config)#int s0/1/1
MIAMI(config-if)#bandwidth 256 MIAMI(config-if)#ip ospf cost 9500
MIAMI(config-if)#
```

```
BUENOSAIRES(config)#router ospf 1
BUENOSAIRES(config-router)#router-id 8.8.8.8
BUENOSAIRES(config-router)#network 172.31.23.0 0.0.0.3 area 0
BUENOSAIRES(config-router)#
00:25:00: %OSPF-5-ADJCHG: Process 1, Nbr 5.5.5.5 on Serial0/0/0 from
LOADING to FULL, Loading Done
```

```
BUENOSAIRES(config-router)#network 192.168.4.0 0.0.3.255 area 0
BUENOSAIRES(config-router)#passive-interface lo4
BUENOSAIRES(config-router)#passive-interface lo5
BUENOSAIRES(config-router)#passive-interface lo6
BUENOSAIRES(config-router)#exit
BUENOSAIRES(config)#int s0/0/0
BUENOSAIRES(config-if)#bandwidth 256
BUENOSAIRES(config-if)#ip ospf cost 9500 BUENOSAIRES(config-if)#
```

```
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)#
00:16:21: %OSPF-5-ADJCHG: Process 1, Nbr 1.1.1.1 on Serial0/1/0
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 f0/1
MIAMI(config-router)#exit
MIAMI(config)#int s0/1/1
MIAMI(config-if)#bandwidth 256|
MIAMI(config-if)#ip ospf cost 9500
MIAMI(config-if)#
```

Figura 5.

```

BOGOTA(config)#router ospf 1
BOGOTA(config-router)#router-id 1.1.1.1
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)#

```

Figura 6.

```

BUENOSAIRES(config)#router ospf 1
BUENOSAIRES(config-router)#router-id 8.8.8.8
BUENOSAIRES(config-router)#network 172.31.23.0 0.0.0.3 area 0
BUENOSAIRES(config-router)#
00:25:00: %OSPF-5-ADJCHG: Process 1, Nbr 5.5.5.5 on Serial0/0/0
from LOADING to FULL, Loading Done

BUENOSAIRES(config-router)#network 192.168.4.0 0.0.3.255 area 0
BUENOSAIRES(config-router)#passive-interface lo4
BUENOSAIRES(config-router)#passive-interface lo5
BUENOSAIRES(config-router)#passive-interface lo6
BUENOSAIRES(config-router)#exit
BUENOSAIRES(config)#int s0/0/0
BUENOSAIRES(config-if)#bandwidth 256
BUENOSAIRES(config-if)#ip ospf cost 9500

```

Figura 7.

- **Visualizar tablas de enrutamiento y routers conectados por OSPFv2**

```

MIAMI#show ip ospf neighbor

Neighbor ID      Pri   State           Dead Time   Address
Interface
1.1.1.1          0    FULL/ -         00:00:34   172.31.21.1
Serial0/1/0
8.8.8.8          0    FULL/ -         00:00:31   172.31.23.2
Serial0/1/1
MIAMI#

```

Figura 8.

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

```

MIAMI#show ip ospf interface

FastEthernet0/1 is up, line protocol is up
  Internet address is 10.10.10.10/24, Area 0
  Process ID 1, Router ID 5.5.5.5, Network Type BROADCAST, Cost: 1
  Transmit Delay is 1 sec, State WAITING, Priority 1
  No designated router on this network
  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)
Serial0/1/1 is up, line protocol is up
  Internet address is 172.31.23.1/30, Area 0
  Process ID 1, Router ID 5.5.5.5, Network Type POINT-TO-POINT, Cost: 9500
  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 00:00:00
  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 8.8.8.8
  Suppress hello for 0 neighbor(s)
Serial0/1/0 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: 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 00:00:09
  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 1 , Adjacent neighbor count is 1
  Adjacent with neighbor 1.1.1.1
  Suppress hello for 0 neighbor(s)

```

Figura 9.

- **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 FastEthernet0/1
  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

```

Figura 10.

**Configurar VLANs, Puertos troncales, puertos de acceso, encapsulamiento, Inter-VLAN Routing y Seguridad en los Switches acorde a la topología de red establecida.**

```

S1(config)#
S1(config)#int f0/3
S1(config-if)#switchport mode trunk
S1(config-if)#switchport trunk native vlan 1
S1(config-if)#
S1(config)#int f0/24
S1(config-if)#switchport mode trunk
S1(config-if)#switchport trunk native vlan 1
S1(config-if)#no shutdown
S1(config-if)#
S1(config)#int range fa0/1-2, fa0/4-24
S1(config-if-range)#switchport mode access
S1(config-if-range)#
S1(config)#int f0/1
S1(config-if)#switchport mode access
S1(config-if)#switchport access vlan 30
S1(config-if)#int range fa0/1-2, fa0/4-24
S1(config-if-range)#shutdown
S1(config)#int vlan 200
S1(config-if)#
%LINK-5-CHANGED: Interface Vlan200, changed state to up

```

```
S1(config-if)#ip address 192.168.99.2 255.255.255.0
S1(config-if)#
S3#conf 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)#exit
S3(config)#
S3(config)#int vlan 200
S3(config-if)#
%LINK-5-CHANGED: Interface Vlan200, changed state to up
S3(config-if)#ip address 192.168.99.3 255.255.255.0
S3(config-if)#
S3(config)#ip default-gateway 192.168.99.1
S3(config)#
S3#
S3(config)#int f0/3
S3(config-if)#switchport mode trunk
S3(config-if)#switchport trunk native vlan 1
S3(config-if)#
S3(config)#int range fa0/1-2, fa0/4-24
S3(config-if-range)#switchport mode access
S3(config-if-range)#
S3(config)#int f0/1
S3(config-if)#switchport mode access
S3(config-if)#switchport access vlan 40
S3(config-if)#int range fa0/1-2, fa0/4-24
S3(config-if-range)#shutdown
```

```
BOGOTA(config)#int f0/0.30
BOGOTA(config-subif)#description accounting LAN
BOGOTA(config-subif)#encapsulation dot1q 30
BOGOTA(config-subif)#ip address 192.168.30.1 255.255.255.0
```

```
BOGOTA(config-subif)#
BOGOTA(config)#int f0/0.40
BOGOTA(config-subif)#description accounting LAN
BOGOTA(config-subif)#encapsulation dot1q 40
BOGOTA(config-subif)#ip address 192.168.40.1 255.255.255.0
BOGOTA(config-subif)#
BOGOTA(config)#int f0/0.200
BOGOTA(config-subif)#description accounting LAN
BOGOTA(config-subif)#encapsulation dot1q 200
BOGOTA(config-subif)#ip address 192.168.200.1 255.255.255.0
BOGOTA(config-subif)#
```

### **3. En el Switch 3 deshabilitar DNS lookup**

```
S3(config)#no ip domain-lookup
```

### **4. Asignar direcciones IP a los Switches acorde a los lineamientos.**

```
S1(config-if)#ip address 192.168.99.2 255.255.255.0
S1(config-if)#
S3(config-if)#ip address 192.168.99.3 255.255.255.0
S3(config-if)#
S3(config)#ip default-gateway 192.168.99.1
S3(config)#
```

### **5. Desactivar todas las interfaces que no sean utilizadas en el esquema de red.**

```
S1(config-if)#int range fa0/1-2, fa0/4-24
S1(config-if-range)#shutdown
S3(config-if)#int range fa0/1-2, fa0/4-24
S3(config-if-range)#shutdown
```

### **6. Implement DHCP and NAT for IPv4**

```
MIAMI(config)#user webuser privilege 15 secret cisco12345
MIAMI(config)#ip nat inside source static 10.10.10.10 209.165.200.229
MIAMI(config)#int f0/0
```



```
MIAMI(config-if)#ip nat outside
MIAMI(config-if)#exit
MIAMI(config)#int          f0/1
MIAMI(config-if)#ip nat inside
MIAMI(config-if)#
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 209.165.200.225 209.165.200.229
netmask 255.255.255.248
MIAMI(config)#
```

#### **7. Configurar R1 como servidor DHCP para las VLANs 30 y 40.**

```
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)#
BOGOTA(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)#
```

#### **8. Reservar las primeras 30 direcciones IP de las VLAN 30 y 40 para configuraciones estáticas.**

```
BOGOTA#conf 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 192.168.30.1 192.168.40.30
BOGOTA(config)#
```

**9. Configurar NAT en R2 para permitir que los host puedan salir a internet**

```
MIAMI(config)#int f0/0
MIAMI(config-if)#ip nat outside
MIAMI(config-if)#exit
MIAMI(config)#int f0/1
MIAMI(config-if)#ip nat inside
MIAMI(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.**

```
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 209.165.200.225 209.165.200.229
netmask 255.255.255.248
MIAMI(config)#ip access-list standard ADMIN
MIAMI(config-std-nacl)#permit host 172.31.21.1
MIAMI(config-std-nacl)#exit
MIAMI(config)#line vty 0 4
MIAMI(config-line)#access-class ADMIN in
MIAMI(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.**

```
MIAMI(config)#access-list 100 permit tcp any host 209.165.200.229 eq www
MIAMI(config)#access-list 100 permit icmp any any echo-reply
```

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

```
MIAMI#show access-lists
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
 30 permit 192.168.4.0 0.0.3.255
Standard IP access list ADMIN
 10 permit host 172.31.21.1
Extended IP access list 100
 10 permit tcp any host 209.165.200.229 eq www
 20 permit icmp any any echo-reply
```

Figura 11.

```
BOGOTA#ping 209.165.200.230

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 209.165.200.230, timeout is 2
seconds:
.!!!!
Success rate is 80 percent (4/5), round-trip min/avg/max = 1/5/18
ms

BOGOTA#
```

Figura 12.

## CONCLUSIONES

De acuerdo con los contenidos vistos dentro del curso Diplomado de Profundización Cisco CCNA, se logra conceptualizar con claridad el término red, que es un conjunto de dispositivos conectados por medio de cables, ondas, señales, y demás métodos de transporte de datos para compartir información y servicios.

El protocolo DHCP es diseñado para ahorrar tiempo en la gestión de direccionamiento IP en una red extensa. Este servicio se encuentra activo en un servidor donde administra las direcciones de la red.

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