

PRUEBA DE HABILIDADES PRACTICAS - DIPLOMADO CISCO CCNA

JOHAN ALBERTO GUERRERO CARREÑO

UNIVERSIDAD NACIONAL ABIERTA Y A DISTANCIA (UNAD)

INGENIERIA DE SISTEMAS

DIPLOMADO DE PROFUNDIZACIÓN CISCO

CURUMANI CESAR

2019

PRUEBA DE HABILIDADES PRACTICAS CCNA

JOHAN ALBERTO GUERRERO CARREÑO

DIPLOMADO DE PROFUNDIZACIÓN CISCO (DISEÑO E IMPLEMENTACIÓN DE  
SOLUCIONES INTEGRADAS LAN WAN)

PRESENTADO A:  
JUAN CARLOS VESGA

UNIVERSIDAD NACIONAL ABIERTA Y A DISTANCIA (UNAD)  
INGENIERIA DE SISTEMAS  
DIPLOMADO DE PROFUNDIZACIÓN CISCO  
CURUMANI CESAR  
2019

Nota de aceptación

---

---

---

---

---

---

---

Firma del presidente del jurado

---

Firma del jurado

---

Firma del jurado

Curumaní Cesar 31 de mayo de 2019

## DEDICATORIA.

Esta actividad está dedicada a mi familia que ha sido mi mayor apoyo y quienes me han motivado a ser mejor persona y un buen profesional.

## AGRADECIMIENTOS.

Quiero agradecer a Dios por ser mi amigo fiel, mi guía en este camino tan largo y tedioso pero que sin su ayuda no hubiera sido posible alcanzar esta meta tan deseada, también a cada una de los tutores que intervinieron en este proceso formativo sin duda alguna son parte fundamental en el aprendizaje y motivación que debe tener cada estudiante.

Quiero agradecer a mi familia que ha sido el motor de mi vida y la inspiración para ser un gran profesional, que con su granito de arena hicieron que un sueño se hiciera realidad.

## Tabla de contenido

### Contenido

INTRODUCCION.....	9
DESARROLLO DE LA PRACTICA .....	11
ESCENARIO 1 .....	11
Parte 1: Configuración del enrutamiento .....	25
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 .....	30
El router ISP deberá tener una ruta estática dirigida hacia cada red interna de Bogotá y Medellín para el caso se suman las subredes de cada uno a /22. 31	
Parte 2: Tabla de Enrutamiento.....	33
Las tablas de los routers restantes deben permitir visualizar rutas redundantes para el caso de la ruta por defecto .....	36
Parte 3: Deshabilitar la propagación del protocolo RIP.....	37
Parte 4: Verificación del protocolo RIP .....	38
El enlace Bogotá1 con ISP se debe configurar con autenticación CHAP .....	41
Parte 6: Configuración de PAT.....	42
Proceda a configurar el NAT en el router Bogotá1. Compruebe que la traducción de direcciones indique las interfaces de entrada y de salida. Al realizar una prueba de ping, la dirección debe ser traducida automáticamente a la dirección de la interfaz serial 0/1/0 del router Bogotá1, como diferente puerto.....	44
Parte 7: Configuración del servicio DHCP .....	45
Configurar la red Medellín2 y Medellín3 donde el router Medellín 2 debe ser el servidor DHCP para ambas redes Lan .....	45
Configure el router Bogotá1 para que habilite el paso de los mensajes Broadcast hacia la IP del router Bogotá2 .....	48
ESCENARIO 2 .....	58
Configurar el direccionamiento IP acorde con la topología de red para cada uno de los dispositivos que forman parte del escenario .....	59
Configuración Web Server .....	61
Configurar el protocolo de enrutamiento OSPFv2 bajo los siguientes criterios: .66	
Configurar VLANs, Puertos troncales, puertos de acceso, encapsulamiento, Inter-VLAN Routing y Seguridad en los Switches acorde a la topología de red establecida.....	68

Configurar R1 como servidor DHCP para las VLANs 30 y 40.....	72
Verificar procesos de comunicación y redireccionamiento de tráfico en los routers mediante el uso de Ping y Traceroute .....	75
CONCLUSIONES .....	78
REFERENCIAS BIBLIOGRAFICAS.....	79

## INTRODUCCION.

El inicio de cada actividad es tener la motivación de hacer las cosas de la mejor manera, la siguiente actividad es el resultado de la prueba de habilidades del diplomado en CISCO CCNA, esta actividad practica se lleva a cabo en Packet Tracer donde se desarrolla cada uno de los escenarios propuestos, evidenciando cada uno de los objetivos solicitados para la configuración correcta.

En estos escenarios se configuran servidores DHCP, también protocolos de Routing dinámico, listas de control de acceso (ACL). Estas pueden implementarse en routers para aumentar la seguridad de la red en equipos específicos.



## RESUMEN.

En esta actividad de habilidades practicas del diplomado de profundización cisco (diseño e implementación de soluciones integradas LAN WAN), se desarrollarán dos escenarios con sus respectivas topologías de red, a las cuales se les debe dar solución de conexión con verificación, este diseño se desarrollará en la aplicación Packet Tracer, con la cual se evidenciará el desarrollo de cada escenario de manera correcta, configurando cada uno de los router, switch y PC. En cada paso del desarrollo de los escenarios se tendrá en cuenta el código para cada una de las configuraciones de esta forma dejar como prueba del desarrollo exitoso de la actividad.

## SUMMARY.

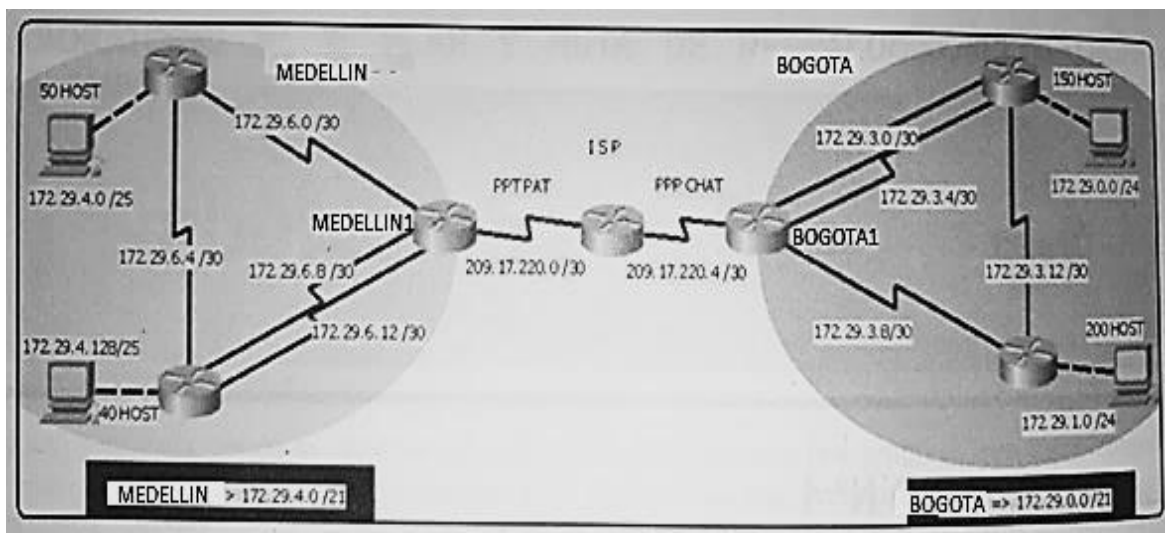
In this activity of practical skills of the cisco deepening diploma (design and implementation of integrated WAN LAN solutions), two scenarios will be developed with their respective network topologies, which should be given connection solution with verification, this design will be developed in the Packet Tracer application, which will show the development of each scenario correctly, configuring each of the router, switch and PC. At each step of the development of the scenarios, the code for each of the configurations will be taken into account in this way, as proof of the successful development of the activity.

## DESARROLLO DE LA PRACTICA.

### 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



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

## Configuración ISP

```
Router>enable
```

```
Router#conf ter
```

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

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

```
Router(config-if)#p address 209.17.220.255.255.255.252
```

```
% Ambiguous command: "p address 209.17.220.255.255.255.252"
```

```
Router(config-if)#p address 209.17.220.5 255.255.255.252
```

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Configuracion MEDELLIN1

Router>ena

Router#conf ter

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

Router(config)#int s0/0/0

Router(config-if)#ip address 209.17.220.2 255.255.255.252

Router(config-if)#no shutdown

Router(config-if)#

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

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

Router(config-if)#int s0/0/1

Router(config-if)#ip address 172.29.6.1 255.255.255.252

Router(config-if)#clock rate 4000000

Router(config-if)#no shutdown

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

Router(config-if)#int s0/1/1

Router(config-if)#ip address 172.29.6.9 255.255.255.252

Router(config-if)#clock rate 4000000

Router(config-if)#no shutdown

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

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

## Configuración MEDELLIN 2

```
Router>ena
```

```
Router#conf ter
```

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

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

```
Router(config-if)#ip address 172.29.6.2 255.255.255.252
```

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

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

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

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

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

```
Router(config-if)#ip address 172.29.6.2 255.255.255.252
```

```
% 172.29.6.0 overlaps with Serial0/0/0
```

```
Router(config-if)#ip address 172.29.6.5 255.255.255.252
```

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

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

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

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

```
Router(config-if)#int g0/0
```

```
Router(config-if)#ip address 172.29.4.1 255.255.255.128
```

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

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

%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up

Configuración MEDELLIN 3

Router>ena

Router#conf ter

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

Router(config)#int s0/0/0

Router(config-if)#ip address 172.29.6.10 255.255.255.252

Router(config-if)#no shutdown

Router(config-if)#

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

Router(config-if)#int s0/0/

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

Router(config-if)#int s0/0/1

Router(config-if)#ip address 172.29.6.14 255.255.255.252

Router(config-if)#no shutdown

Router(config-if)#

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

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

Router(config-if)#int s0/1/0

Router(config-if)#ip address 172.29.6.6 255.255.255.252

Router(config-if)#no shutdown

Router(config-if)#

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

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

Router(config-if)#int g0/0

Router(config-if)#ip address 172.29.4.129 255.255.255.128

Router(config-if)#no shutdown

Router(config-if)#

%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up

Configuración BOGOTA1

Router>enable

Router#conf ter

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

Router(config)#s0/0/0

Router(config)#int s0/0/0

Router(config-if)#ip address 209.17.220.6 255.255.255.252

Router(config-if)#no shutdown

Router(config-if)#

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

Router(config-if)#int s0/0/1



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

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

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

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

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

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

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

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

```
Router(config-if)#ip address 172.29.3.1 255.255.255.252
```

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

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

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

```
Router(config-if)#int s0/1/1
```

```
Router(config-if)#ip address 172.29.3.5 255.255.255.252
```

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

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

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

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

Configuración BOGOTA 2

```
Router>
```

```
Router>enable
```

```
Router#conf ter
```

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

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

```
Router(config-if)#ip address 172.29.3.10 255.255.255.252
```

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

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

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

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

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

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

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

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

```
Router(config-if)#ip address 172.29.3.13 255.255.255.252
```

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

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

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

```
Router(config-if)#int g0/0
```

```
Router(config-if)#ip address 172.29.1.1 255.255.255.0
```

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

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

```
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up
```

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up

Configuración BOGOTA 3

Router>enable

Router#conf ter

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

Router(config)#int s0/0/0

Router(config-if)#ip address 172.29.3.2 255.255.255.252

Router(config-if)#no shutdown

Router(config-if)#

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

Router(config-if)#int s0/0/0

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

Router(config-if)#int s0/0/1

Router(config-if)#ip address 172.29.3.6 255.255.255.252

Router(config-if)#no shutdown

Router(config-if)#

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

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

Router(config-if)#int g0/0

Router(config-if)#ip address 172.29.0.1 255.255.255.0

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

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

```
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0,  
changed state to up
```

```
Router(config)#int s0/1/0
```

```
Router(config-if)#ip address 172.29.3.14 255.255.255.252
```

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

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.

## Desarrollo

Como trabajo inicial se debe realizar lo siguiente.

Realizar las rutinas de diagnóstico y dejar los equipos listos para su configuración (asignar nombres de equipos, asignar claves de seguridad, etc).

Realizar la conexión física de los equipos con base en la topología de red

Configurar la topología de red, de acuerdo con las siguientes especificaciones.

## MEDELLIN#CONF TER

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

```
MEDELLIN (config)#no ip domain-lookup
MEDELLIN (config)#service password-encryption
MEDELLIN (config)#enable secret class
MEDELLIN(config)#banner motd #Acceso Restringido-JohanGuerrero#
MEDELLIN(config)#line con 0
MEDELLIN (config-line)#password cisco
MEDELLIN (config-line)#login
MEDELLIN (config-line)#line vty 0 4
MEDELLIN (config-line)#password cisco
MEDELLIN (config-line)#login
MEDELLIN (config-line)#
```

```
Router>ena
```

```
Router#conf ter
```

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

```
Router(config)#no ip domain-lookup
Router(config)#service password-encryption
Router(config)#enable secret class
Router(config)#banner motd #Acceso Restringido-JohanGuerrero#
Router(config)#line con 0
Router(config-line)#password cisco
Router(config-line)#login
Router(config-line)#line vty 0 4
```

```
Router(config-line)#password cisco
Router(config-line)#login
Router(config-line)#hostname MEDELLIN2
MEDELLIN2(config)#
```

```
Router>ena
```

```
Router#conf ter
```

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

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

```
Router(config)#service password-encryption
```

```
Router(config)#enable secret class
```

```
Router(config)#banner motd #Acceso Restringido-JohanGuerrero#
```

```
Router(config)#line con 0
```

```
Router(config-line)#password cisco
```

```
Router(config-line)#login
```

```
Router(config-line)#line vty 0 4
```

```
Router(config-line)#password cisco
```

```
Router(config-line)#login
```

```
Router(config-line)#hostname MEDELLIN3
```

```
MEDELLIN3 (config)#
```

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

```
BOGOTA(config)#service password-encryption
```

```
BOGOTA(config)#enable secret class
BOGOTA(config)#banner motd #Acceso Restringido-JohanGuerrero#
BOGOTA(config)#line con 0
BOGOTA(config-line)#password cisco
BOGOTA(config-line)#login
BOGOTA(config-line)#line vty 0 4
BOGOTA(config-line)#password cisco
BOGOTA(config-line)#login
BOGOTA(config-line)#
```

```
Router>ena
```

```
Router#conf ter
```

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

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

```
Router(config)#service password-encryption
```

```
Router(config)#enable secret class
```

```
Router(config)#banner motd #Acceso Restringido-JohanGuerrero#
```

```
Router(config)#line con 0
```

```
Router(config-line)#password cisco
```

```
Router(config-line)#login
```

```
Router(config-line)#line vty 0 4
```

```
Router(config-line)#password cisco
```

```
Router(config-line) #login
```

```
Router(config-line) #hostname BOGOTA2
```

```
BOGOTA2(config)#
```

```
Router>ena
```

```
Router#conf ter
```

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

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

```
Router(config)#service password-encryption
```

```
Router(config)#enable secret class
```

```
Router(config)#banner motd #Acceso Restringido-JohanGuerrero#
```

```
Router(config)#line con 0
```

```
Router(config-line)#password cisco
```

```
Router(config-line)#login
```

```
Router(config-line)#line vty 0 4
```

```
Router(config-line)#password cisco
```

```
Router(config-line)#login
```

```
Router(config-line)#hostname BOGOTA3
```

```
BOGOTA3(config)#
```

## Parte 1: Configuración del enrutamiento

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



RIP MEDELLIN1

Router>ena

Router#conf ter

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

Router(config)#router rip

Router(config-router)#version 2

Router(config-router)#no auto-summary

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

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

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

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

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

Router(config-router)#network 172.29.6.0

Router(config-router)#network 172.29.6.8

Router(config-router)#network 172.29.6.12

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

RIP MEDELLIN2

Router>enable

Router#conf ter

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

Router(config)#router rip

Router(config-router)#version 2

```
Router(config-router)#no auto-summary
Router(config-router)#do show ip route connected
C 172.29.4.0/25 is directly connected, GigabitEthernet0/0
C 172.29.6.0/30 is directly connected, Serial0/0/0
C 172.29.6.4/30 is directly connected, Serial0/0/1
Router(config-router)#network 172.29.4.0
Router(config-router)#network 172.29.6.0
Router(config-router)#network 172.29.6.4
Router(config-router)#passive-interface g0/0
Router(config-router)#
```

### RIP MEDELLIN3

```
Router>enable
Router#conf ter
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router rip
Router(config-router)#version 2
Router(config-router)#no auto-summary
Router(config-router)#do show ip route connected
C 172.29.4.128/25 is directly connected, GigabitEthernet0/0
C 172.29.6.4/30 is directly connected, Serial0/1/0
C 172.29.6.8/30 is directly connected, Serial0/0/0
C 172.29.6.12/30 is directly connected, Serial0/0/1
```

```
Router(config-router) #network 172.29.4.128
```

```
Router(config-router) #network 172.29.6.4
```

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

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

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

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

RIP BOGOTA 1

```
Router>enable
```

```
Router#conf ter
```

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

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

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

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

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

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

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

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

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

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

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

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

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

```
Router(config-router)#  
RIP BOGOTA 2  
Router(config)#router rip  
Router(config-router)#version 2  
Router(config-router)#no auto-summary  
Router(config-router)#do show ip route connected  
C 172.29.1.0/24 is directly connected, GigabitEthernet0/0  
C 172.29.3.8/30 is directly connected, Serial0/0/0  
C 172.29.3.12/30 is directly connected, Serial0/0/1  
Router(config-router)#network 172.29.1.0  
Router(config-router)#network 172.29.3.8  
Router(config-router)#network 172.29.3.12  
Router(config-router)#passive-interface g0/0  
Router(config-router)#
```

```
RIP BOGOTA 3  
Router(config)#router rip  
Router(config-router)#version 2  
Router(config-router)#no auto-summary  
Router(config-router)#do show ip route connected  
C 172.29.0.0/24 is directly connected, GigabitEthernet0/0  
C 172.29.3.0/30 is directly connected, Serial0/0/0  
C 172.29.3.4/30 is directly connected, Serial0/0/1
```

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

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

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

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

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

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

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

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.

Configuración MEDELLIN 1

```
Router>enable
```

```
Router#conf ter
```

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

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

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

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

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

Configuración BOGOTA 1

```
Router#conf ter
```

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

```
Router(config)#ip route 0.0.0.0 0.0.0.0 209.17.220.5
```

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

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

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

MEDELLIN														
172	29	0	0	0	0	0	1	0	0	0	0	0	0	172.29.4.0/25
172	29	0	0	0	0	0	1	0	0	1	0	0	0	172.29.4.128/25
172	29	0	0	0	0	0	1	1	0	0	0	0	0	172.29.6.4/30
172	29	0	0	0	0	0	1	1	0	0	0	0	1	172.29.6.8/30
172	29	0	0	0	0	0	1	1	0	0	0	0	1	172.29.6.12/30
172	29	0	0	0	0	0	1	1	0	0	0	0	0	172.29.6.0/30
172	29	0	0	0	0	0	1	0	0	0	0	0	0	172.29.4.0/22

BOGOTA														
172	29	0	0	0	0	0	0	0	0	0	0	0	0	172.29.0.0/24
172	29	0	0	0	0	0	0	1	0	0	0	0	0	172.29.1.0/24
172	29	0	0	0	0	0	0	1	1	0	0	0	1	172.29.3.12/30
172	29	0	0	0	0	0	0	1	1	0	0	0	1	172.29.3.8/30
172	29	0	0	0	0	0	0	1	1	0	0	0	0	172.29.3.0/30
172	29	0	0	0	0	0	0	1	1	0	0	0	0	172.29.3.4/30
172	29	0	0	0	0	0	0	0	0	0	0	0	0	172.29.0.0/22

```
Router>ena
```

```
Router#configure ter
```

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

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

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

```
Router(config)#
```

Verificación

```
Router>ena
```

Router#ping 172.29.3.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.29.3.1, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 1/10/18 ms

Router#ping 209.17.220.5

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 209.17.220.5, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 2/12/24 ms

Router#ping 209.17.220.2

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 209.17.220.2, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 6/15/21 ms

Router#ping 172.29.6.2

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.29.6.2, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 12/18/24 ms

## Parte 2: Tabla de Enrutamiento.

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

Configuración MEDELLIN 1

```
Router>enable
```

```
Router#show ip route
```

Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP

D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area

N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP

i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area

\* - candidate default, U - per-user static route, o - ODR

P - periodic downloaded static route

Gateway of last resort is 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 [120/1] via 172.29.6.2, 00:00:16, Serial0/0/1

R 172.29.4.128/25 [120/1] via 172.29.6.10, 00:00:00, Serial0/1/0

[120/1] via 172.29.6.14, 00:00:00, Serial0/1/1

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, 00:00:00, Serial0/1/0

[120/1] via 172.29.6.14, 00:00:00, Serial0/1/1



[120/1] via 172.29.6.2, 00:00:16, Serial0/0/1  
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  
--More--

#### Configuración BOGOTA 1

Router>ena

Router#SHOW IP ROUTE

Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP

D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area

N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP

i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area

\* - candidate default, U - per-user static route, o - ODR

P - periodic downloaded static route

Gateway of last resort is 209.17.220.5 to network 0.0.0.0

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

R 172.29.0.0/24 [120/1] via 172.29.3.6, 00:00:02, Serial0/1/1

[120/1] via 172.29.3.2, 00:00:02, Serial0/1/0

R 172.29.1.0/24 [120/1] via 172.29.3.10, 00:00:06, Serial0/0/1

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  
 R 172.29.3.12/30 [120/1] via 172.29.3.10, 00:00:06, Serial0/0/1  
 [120/1] via 172.29.3.6, 00:00:02, Serial0/1/1  
 [120/1] via 172.29.3.2, 00:00:02, Serial0/1/0  
 209.17.220.0/24 is variably subnetted, 2 subnets, 2 masks  
 C 209.17.220.4/30 is directly connected, Serial0/0/0  
 --More--

*Verificar el balanceo de carga que presentan los routers.*

```

MEDELLIN3
Physical Config CLI
IOS Command Line Interface
Router#ena
Router#show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
I - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route

Gateway of last resort is 172.29.6.13 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 172.29.6.5, 00:00:20, Serial0/1/0
C 172.29.4.128/25 is directly connected, GigabitEthernet0/0
L 172.29.4.129/32 is directly connected, GigabitEthernet0/0
R 172.29.6.0/30 [120/1] via 172.29.6.9, 00:00:07, Serial0/0/0
[120/1] via 172.29.6.13, 00:00:07, Serial0/0/1
[120/1] via 172.29.6.5, 00:00:20, Serial0/1/0
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
E 172.29.6.12/30 is directly connected, Serial0/0/1
L 172.29.6.14/32 is directly connected, Serial0/0/1
R* 0.0.0.0 [120/1] via 172.29.6.13, 00:00:07, Serial0/0/1
[120/1] via 172.29.6.9, 00:00:07, Serial0/0/0
Router#
Router#
  
```

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.

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

### Configuración MEDELLIN3

```
R 172.29.6.0/30 [120/1] via 172.29.6.9, 00:00:07, Serial0/0/0
```

```
[120/1] via 172.29.6.13, 00:00:07, Serial0/0/1
```

```
[120/1] via 172.29.6.5, 00:00:20, Serial0/1/0
```

```
R* 0.0.0.0/0 [120/1] via 172.29.6.13, 00:00:07, Serial0/0/1
```

```
[120/1] via 172.29.6.9, 00:00:07, Serial0/0/0
```

### Configuración BOGOTA 3

```
R 172.29.3.8/30 [120/1] via 172.29.3.5, 00:00:22, Serial0/0/1
```

```
[120/1] via 172.29.3.1, 00:00:22, Serial0/0/0
```

```
[120/1] via 172.29.3.13, 00:00:28, Serial0/1/0
```

```
R* 0.0.0.0/0 [120/1] via 172.29.3.5, 00:00:22, Serial0/0/1
```

```
[120/1] via 172.29.3.1, 00:00:22, Serial0/0/0
```

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

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

Router>ena

Router#configure ter

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

Router(config)#ip route 172.29.4.0 255.255.252.0 209.17.220.2

Router(config)#ip route 172.29.0.0 255.255.252.0 209.17.220.6

### Parte 3: Deshabilitar la propagación del protocolo RIP.

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

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

#### Parte 4: Verificación del protocolo RIP.

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.

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.

##### Configuración MEDELLIN 1

```
Router(config-router)#network 172.29.6.0
Router(config-router)#network 172.29.6.8
Router(config-router)#network 172.29.6.12
Router(config-router)#passive-interface s0/0/0
```

##### Configuración MEDELLIN 2

```
Router(config-router)#network 172.29.4.0
Router(config-router)#network 172.29.6.0
Router(config-router)#network 172.29.6.4
Router(config-router)#passive-interface g0/0
Router(config-router)#
```

##### Configuración MEDELLIN 3

```
Router(config-router)#network 172.29.4.128
Router(config-router)#network 172.29.6.4
```

```
Router(config-router)#network 172.29.6.8
Router(config-router)#network 172.29.6.12
Router(config-router)#passive-interface g0/0
```

#### Configuración BOGOTA 1

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

#### Configuración BOGOTA 2

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

#### Configuración BOGOTA 3

```
Router(config-router)#network 172.29.0.0
Router(config-router)#network 172.29.3.0
Router(config-router)#network 172.29.3.4
Router(config-router)#network 172.29.3.12
Router(config-router)#passive-interface g0/0
```

Parte 5: Configurar encapsulamiento y autenticación PPP.

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

Configuración MEDDELLIN 1

```
Router#conf ter
```

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

```
Router(config)#hostname MEDELLIN
```

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

```
MEDELLIN(config)#
```

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

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

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

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

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

```
MEDELLIN(config-if)#
```

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

```
MEDELLIN#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 = 1/10/16 ms

## Configuración ISP

```
Router#conf ter
```

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

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

```
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 Set outbound PAP username
```

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

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

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

El enlace Bogotá1 con ISP se debe configurar con autenticación CHAP.

```
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)#
ISP(config-if)#ppp authentication chap
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/1, changed state
to up
ISP(config-if)#exi
ISP(config)#exit
ISP#
%SYS-5-CONFIG_I: Configured from console by console

ISP#ping 209.17.220.6
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 209.17.220.6, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/7/16 ms
```

## Parte 6: Configuración de PAT.

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.

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

#### Configuración MEDELLIN 1

```
MEDELLIN>ena
```

```
MEDELLIN#conf ter
```

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

```
MEDELLIN(config)#ip nat inside source list 1 interface s0/0/0 overload
```

```
MEDELLIN(config)#access-list 1 permit 172.29.4.0 0.0.3.255
```

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

```
MEDELLIN(config-if)#ip nat outside
```

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

```
MEDELLIN(config-if)#ip nat inside
```

```
MEDELLIN(config-if)#int s0/1/1
```

```
MEDELLIN(config-if)#ip nat inside
```

```
MEDELLIN(config-if)#
```

#### Configuración BOGOTA 1

```
BOGOTA# conf ter
```

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

```
BOGOTA(config)#ip nat inside source list 1 interface s0/0/0 overload
```

```
BOGOTA(config)#access-list 1 permit 172.29.0.0 0.0.3.255
BOGOTA(config)#int s0/0/0
BOGOTA(config-if)#ip nat outside
BOGOTA(config-if)#int s0/0/1
BOGOTA(config-if)#ip nat inside
BOGOTA(config-if)#int s0/1/0
BOGOTA(config-if)#ip nat inside
BOGOTA(config-if)#int s0/1/1
BOGOTA(config-if)#ip nat inside
BOGOTA(config-if)#
```

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.

```
BOGOTA#show ip nat translations
```

```
Pro Inside global Inside local Outside local Outside global
```

```
icmp 209.17.220.6:21 172.29.0.6:21 209.17.220.5:21 209.17.220.5:21
```

```
icmp 209.17.220.6:22 172.29.0.6:22 209.17.220.5:22 209.17.220.5:22
```

```
icmp 209.17.220.6:23 172.29.0.6:23 209.17.220.5:23 209.17.220.5:23
```

```
icmp 209.17.220.6:24 172.29.0.6:24 209.17.220.5:24 209.17.220.5:24
```

## Parte 7: Configuración del servicio DHCP.

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

### Configuración MEDELLIN2

```
Router>ena
```

```
Router#conf ter
```

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

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

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

```
Router(config)#ip dhcp pool MEDELLIN2
```

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

```
Router(dhcp-config)#default-router 172.29.4.1
```

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

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

```
Router(config)#ip dhcp pool MEDELLIN3
```

```
Router(dhcp-config)#network 172.29.4.128 255.255.255.128
```

```
Router(dhcp-config)#default-router 172.29.4.129
```

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

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

### Configuración MEDELLIN3

```
Router>ena
```

```
Router#conf ter
```

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

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

```
Router(config-if)#ip helper-address 172.29.6.5
```

El router Medellín3 deberá habilitar el paso de los mensajes broadcast hacia la IP del router Medellín2.

Configurar la red Bogotá2 y Bogotá3 donde el router Medellín2 debe ser el servidor DHCP para ambas redes Lan.

Configuración BOGOTA 2

```
Router>ena
```

```
Router#conf ter
```

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

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

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

```
Router(config)#ip dhcp pool BOGOTA2
```

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

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

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

```
Router(dhcp-config)#ip dhcp pool BOGOTA3
```

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

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

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

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

### Configuración BOGOTA 3

```
Router>ena
```

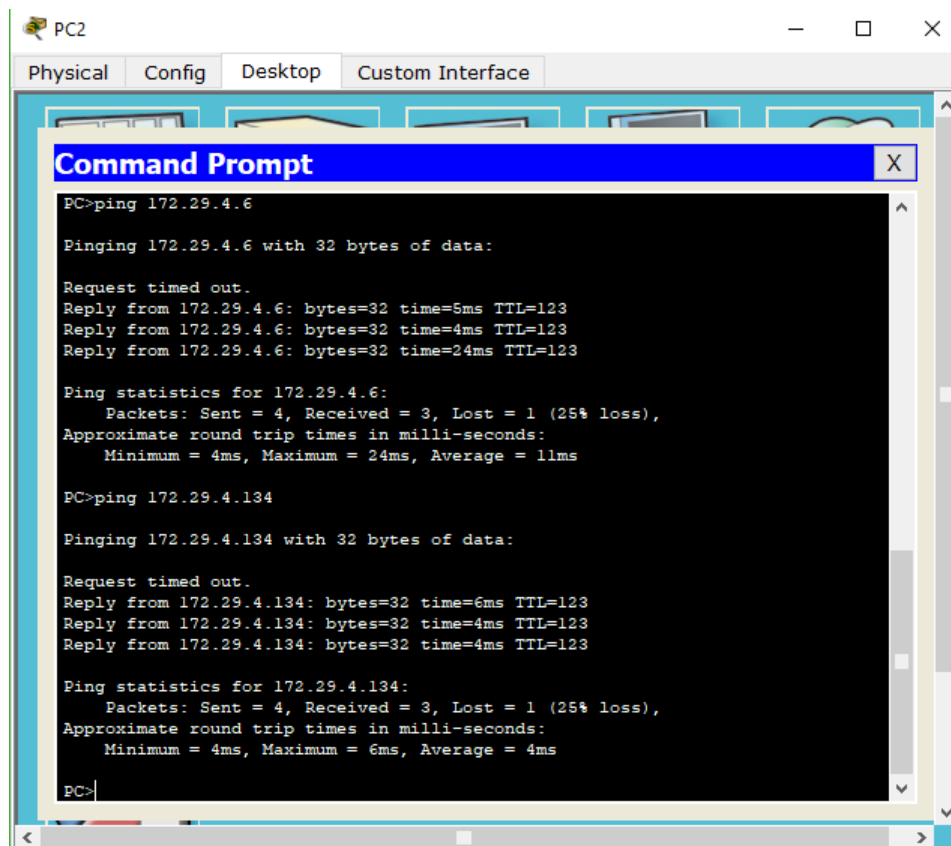
```
Router#conf ter
```

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

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

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

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



Configure el router Bogotá1 para que habilite el pasode los mensajes Broadcast hacia la IP del router Bogotá2.

Configuración ISP

```
Router>enable
```

```
Router#conf ter
```

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

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

```
Router(config-if)#p address 209.17.220.255.255.255.252
```

```
% Ambiguous command: "p address 209.17.220.255.255.255.252"
```

```
Router(config-if)#p address 209.17.220.5 255.255.255.252
```

```
% Ambiguous command: "p address 209.17.220.5 255.255.255.252"
```

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

```
Configuración MEDELLIN1
```

```
Router>ena
```

```
Router#conf ter
```

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

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

```
Router(config-if)#ip address 209.17.220.2 255.255.255.252
```

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

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

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

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

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

```
Router(config-if)#ip address 172.29.6.1 255.255.255.252
```

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

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

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

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



Router(config-if)#int s0/1/1

Router(config-if)#ip address 172.29.6.9 255.255.255.252

Router(config-if)#clock rate 4000000

Router(config-if)#no shutdown

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

Router(config-if)#shutdown

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

Router(config-if)#int s0/1/0

Router(config-if)#ip address 172.29.6.13 255.255.255.252

Router(config-if)#clock rate 4000000

Router(config-if)#no shutdown

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

Router(config-if)#

Router(config-if)#shutdown

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

Router(config-if)#

Router(config-if)#int s0/1/0

Router(config-if)#ip address 172.29.6.9 255.255.255.252

Router(config-if)#clock rate 4000000

Router(config-if)#no shutdown

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

Router(config-if)#

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

## Configuración MEDELLIN 2

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

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

### Configuración MEDELLIN 3

```
Router>ena
Router#conf ter
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#int s0/0/0
Router(config-if)#ip address 172.29.6.10 255.255.255.252
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up
Router(config-if)#int s0/0/1
Router(config-if)#ip address 172.29.6.14 255.255.255.252
Router(config-if)#no shutdown
Router(config-if)#
```

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

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

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

```
Router(config-if)#ip address 172.29.6.6 255.255.255.252
```

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

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

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

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

```
Router(config-if)#int g0/0
```

```
Router(config-if)#ip address 172.29.4.129 255.255.255.128
```

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

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

%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up

Configuración BOGOTA1

```
Router>enable
```

```
Router#conf ter
```

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

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

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

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

Router(config-if)#

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

Router(config-if)#int s0/0/1

Router(config-if)#

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

Router(config-if)#int s0/0/1

Router(config-if)#ip address 172.29.3.9 255.255.255.252

Router(config-if)#clock rate 4000000

Router(config-if)#no shutdown

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

Router(config-if)#

Router(config-if)#int s0/1/0

Router(config-if)#ip address 172.29.3.1 255.255.255.252

Router(config-if)#clock rate 4000000

Router(config-if)#no shutdown

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

Router(config-if)#int s0/1/1

Router(config-if)#ip address 172.29.3.5 255.255.255.252

Router(config-if)#clock rate 4000000

Router(config-if)#no shutdown

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

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

Configuración BOGOTA 2

```
Router>enable
```

```
Router#conf ter
```

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

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

```
Router(config-if)#ip address 172.29.3.10 255.255.255.252
```

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

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

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

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

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

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

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

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

```
Router(config-if)#ip address 172.29.3.13 255.255.255.252
```

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

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

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

```
Router(config-if)#int g0/0
```

```
Router(config-if)#clock rate 4000000
Router(config-if)#ip address 172.29.1.1 255.255.255.0
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0,
changed state to up
```

### Configuración BOGOTA 3

```
Router>ena
Router#conf ter
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#int s0/0/0
Router(config-if)#ip address 172.29.3.2 255.255.255.252
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up
Router(config-if)#int s0/0/0
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state
to up
Router(config-if)#int s0/0/1
Router(config-if)#ip address 172.29.3.6 255.255.255.252
Router(config-if)#no shutdown
```

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

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

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

```
Router(config-if)#int g0/0
```

```
Router(config-if)#ip address 172.29.0.1 255.255.255.0
```

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

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

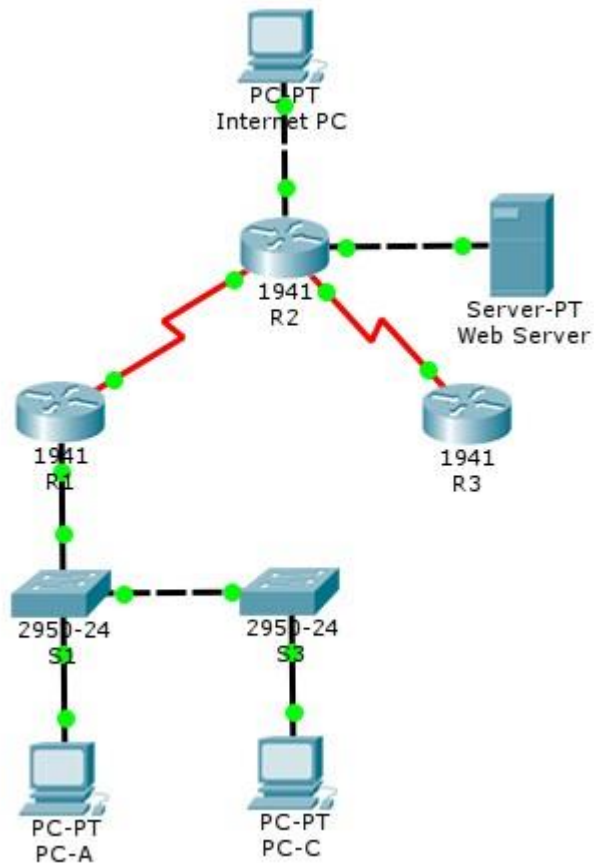
```
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0,  
changed state to up
```



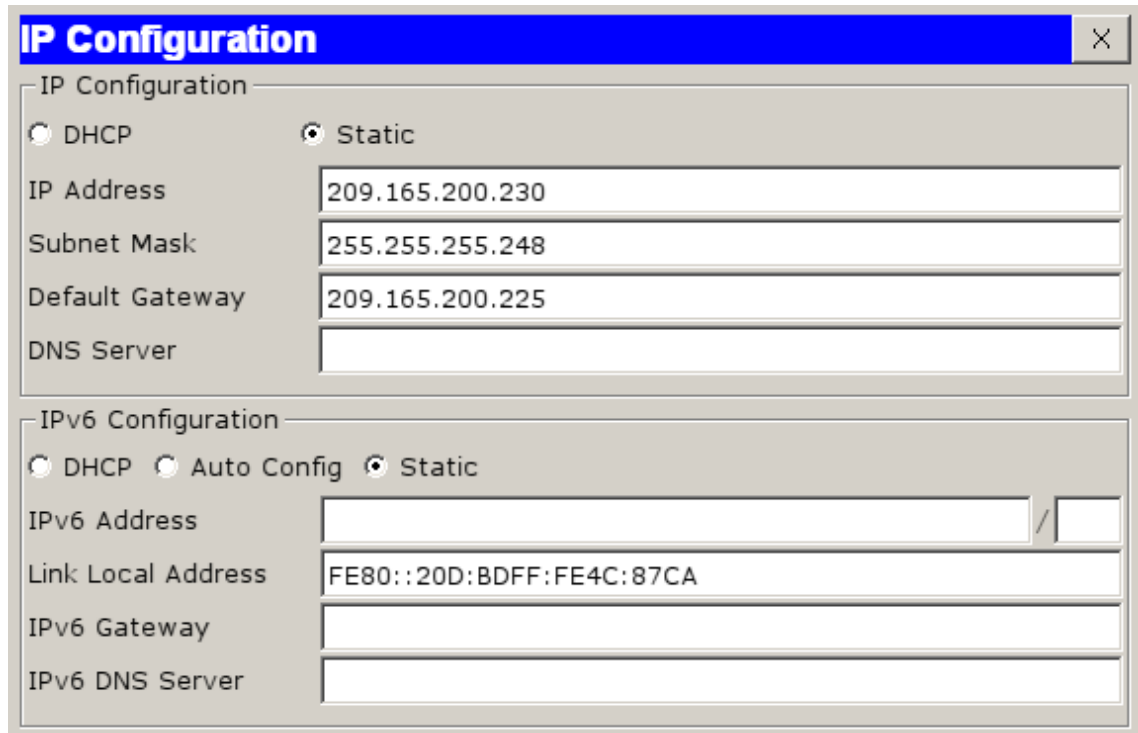
## ESCENARIO 2.

Escenario: 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.



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

Internet PC



IP Configuration	
<input type="radio"/> DHCP <input checked="" type="radio"/> Static	
IP Address	209.165.200.230
Subnet Mask	255.255.255.248
Default Gateway	209.165.200.225
DNS Server	

IPv6 Configuration	
<input type="radio"/> DHCP <input type="radio"/> Auto Config <input checked="" type="radio"/> Static	
IPv6 Address	
Link Local Address	FE80::20D:BDFF:FE4C:87CA
IPv6 Gateway	
IPv6 DNS Server	

Configuración R2

```
R2>ena
```

```
R2#conf ter
```

```
R2(config)#no ip domain-lookup
```

```
R2(config)#enable secret class
```

```
R2(config)#line con 0
```

```
R2(config-line)#password cisco
```

```
R2(config-line)#login
```

```
R2(config-line)#line vty 0 4
R2(config-line)#password cisco
R2(config-line)#login
R2(config-line)#exit
R2(config)#service password-encryption
R2(config)#banner motd *Prohibido el Acceso a personal no Autorizado*

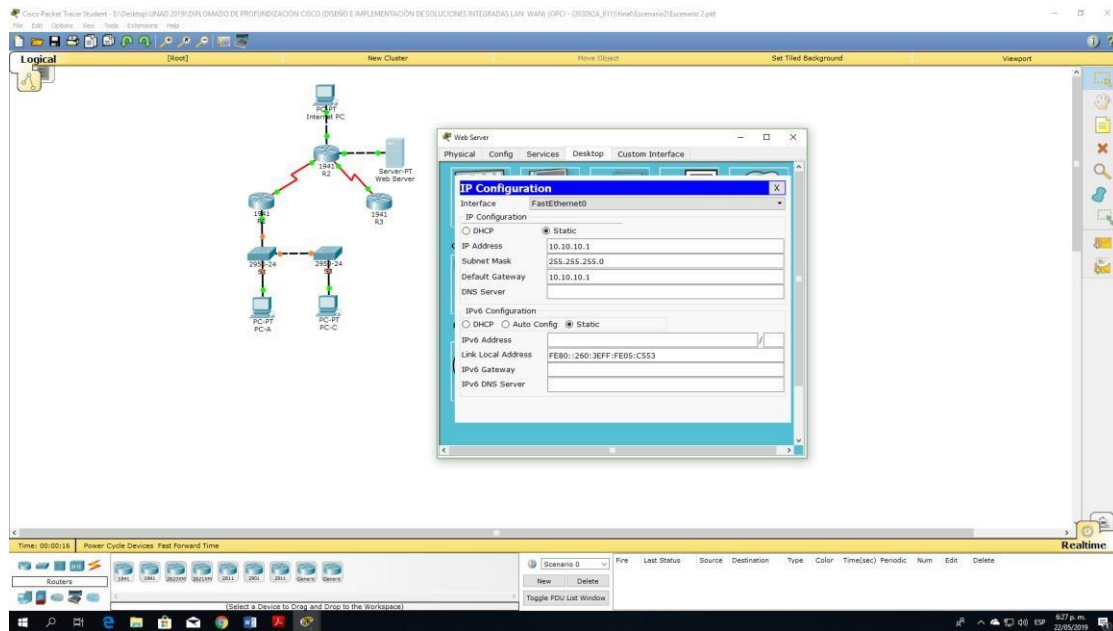
R2(config)#inte s0/0/0
R2(config-if)#description Conexion con R3
R2(config-if)#ip address 172.31.23.1 255.255.255.252
R2(config-if)#clock rate 128000
R2(config-if)#no shut
R2(config-if)#int s0/0/1
R2(config-if)#description Conexion con R1
R2(config-if)#ip address 172.31.21.2 255.255.255.252
R2(config-if)#no shut
R2(config-if)#int g0/1
R2(config-if)#description Conexion PC Internet
R2(config-if)#ip address 209.165.200.225 255.255.255.248
R2(config-if)#no shut
R2(config-if)#int g0/0
R2(config-if)#description Conexion con Web Server
R2(config-if)#ip address 10.10.10.1 255.255.255.0
```

```
R2(config-if)#no shut
```

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

```
R2(config)#ip route 0.0.0.0 0.0.0.0 g0/1
```

## Configuración Web Server



## Configuración R1

```
R1>ena
```

```
R1#configure terminal
```

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

```
R1(config)#no ip domain lookup
```

```
R1(config)#enable secret class
```

```
R1(config)#line con 0
```

```
R1(config-line)#password cisco
R1(config-line)#login
R1(config-line)#line vty 0 4
R1(config-line)#password class
R1(config-line)#login
R1(config-line)#exit
R1(config)#service password-encryption
R1(config)#banner motd *Prohibido el Acceso a personal no Autorizado*

R1(config)#int s0/0/0
R1(config-if)#description Conexion con R2
R1(config-if)#ip address 172.31.21.1 255.255.255.252
R1(config-if)#clock rate 128000
R1(config-if)#no shut
R1(config)#ip route 0.0.0.0 0.0.0.0 s0/0/0
R1(config)#int g0/0.30
R1(config-subif)#description ADMINISTRACION LAN
R1(config-subif)#encapsulation dot1Q 30
R1(config-subif)#ip address 192.168.30.1 255.255.255.0
R1(config)#int g0/0.40
R1(config-subif)#description MERCADEO LAN
R1(config-subif)#encapsulation dot1Q 40
R1(config-subif)#ip address 192.168.40.1 255.255.255.0
```

```
R1(config)#int g0/0.200
R1(config-subif)#description MANTENIMIENTO LAN
R1(config-subif)#encapsulation dot1Q 200
R1(config-subif)#ip address 192.168.200.1 255.255.255.0
R1(config)#int g0/0
R1(config-if)#no shut
```

### Configuración R3

```
R3>ena
R3#conf ter
Enter configuration commands, one per line. End with CNTL/Z.
R3(config)#no ip domain-lookup
R3(config)#enable secret class
R3(config)#line con 0
R3(config-line)#password cisco
R3(config-line)#login
R3(config-line)#line vty 0 4
R3(config-line)#password cisco
R3(config-line)#login
R3(config-line)#exit
R3(config)#service password-encryption
R3(config)#banner motd *Prohibido el Acceso a personal no Autorizado*
```

```
R3(config)#int s0/0/1
R3(config-if)#description Conexion con R2
R3(config-if)#ip address 172.31.23.2 255.255.255.252
R3(config-if)#no shut
R3(config-if)#int loopback 4
R3(config-if)#ip address 192.168.4.1 255.255.255.0
R3(config-if)#no shut
R3(config-if)#int loopback 5
R3(config-if)#ip address 192.168.5.1 255.255.255.0
R3(config-if)#no shut
R3(config-if)#int loopback 6
R3(config-if)#ip address 192.168.6.1 255.255.255.0
R3(config-if)#no shut
R3(config-if)#exit
R3(config)#ip route 0.0.0.0 0.0.0.0 s0/0/1
```

### Configuración S1

```
S1>ena
S1#conf ter
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)#line vty 0 4
S1(config-line)#password cisco
S1(config-line)#login
S1(config-line)#exit
S1(config)#service password-encryption
S1(config)#banner motd *Prohibido el Acceso a personal no autorizado*
```

### Configuración S3

```
S3>ena
S3#conf ter
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)#line vty 0 4
S3(config-line)#password cisco
S3(config-line)#login
S3(config-line)#exit
S3(config)#service password-encryption
S3(config)#banner motd *Prohibido el Acceso a personal no autorizado*
```



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

Configuración R1

```
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 0.0.0.255 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 g0/0.30
```

```
R1(config-router)#passive-interface g0/0.40
```

```
R1(config-router)#passive-interface g0/0.200
```

```
R1(config-router)#exit
```

```
R1(config)#int s0/0/0
```

```
R1(config-if)#bandwidth 256
```

```
R1(config-if)#ip ospf cost 9500
```

Configuración R2

```
R2>ena
```

```
R2#conf ter
R2(config)#router ospf 1
R2(config-router)#router-id 2.2.2.2
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
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 g0/0
R2(config)#int s0/0/0
R2(config-if)#bandwidth 256
R2(config-if)#ip ospf cost 9500
R2(config)#int s0/0/1
R2(config-if)#bandwidth 256
R2(config-if)#ip ospf cost 9500
```

### Configuración R3

```
R3>ena
R3#conf ter
R3(config)#router ospf 1
R3(config-router)#router-id 3.3.3.3
R3(config-router)#Network 172.31.23.0 0.0.0.3 area 0
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)#int s0/0/1
```

```
R3(config-if)#bandwidth 256
```

```
R3(config-if)#ip ospf cost 9500
```

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

Configuración S1

```
S1>ena
```

```
S1#conf ter
```

```
S1(config)#vlan 30
```

```
S1(config-vlan)#name ADMINISTRACION
```

```
S1(config-vlan)#exit
```

```
S1(config)#vlan 40
```

```
S1(config-vlan)#name MERCADEO
```

```
S1(config-vlan)#exit
```

```
S1(config)#vlan 200
```

```
S1(config-vlan)#name MANTENIMIENTO
```

```
S1#show vlan
```

VLAN Name	Status	Ports
1 default	active	Fa0/1, Fa0/2, Fa0/3, Fa0/4 Fa0/5, Fa0/6, Fa0/7, Fa0/8 Fa0/9, Fa0/10, Fa0/11, Fa0/12 Fa0/13, Fa0/14, Fa0/15, Fa0/16 Fa0/17, Fa0/18, Fa0/19, Fa0/20 Fa0/21, Fa0/22, Fa0/23, Fa0/24
30 ADMINISTRACION	active	
40 MERCADEO	active	
200 MANTENIMIENTO	active	
1002 fddi-default	act/unsup	
1003 token-ring-default	act/unsup	
1004 fddinet-default	act/unsup	
1005 trnet-default	act/unsup	

```
S1#conf ter
```

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

```
S1(config)#int vlan 200
```

```
S1(config-if)#ip address 192.168.200.2 255.255.255.0
```

```
S1(config-if)#ip default-gateway 192.168.200.1
```

```
S1(config-if)#no shut
```

```
S1(config)#int f0/3
```

```
S1(config-if)#switchport mode trunk
```

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

```
S1(config)#int f0/24
```

```
S1(config-if)#switchport mode trunk
```

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

```
S1(config)#int range f0/2, f0/4-23
```

```
S1(config-if-range)#switchport mode access
```

```
S1(config)#int f0/1
S1(config-if)#switchport mode access
S1(config-if)#switchport access vlan 30
```

### Configuración S3

```
S3>ena
S3#conf ter
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)#int vlan 200
S3(config-if)#ip address 192.168.200.3 255.255.255.0
S3(config-if)#ip default-gateway 192.168.200.1
S3(config-if)#no shut
S3(config-if)#int f0/3
S3(config-if)#switchport mode trunk
S3(config-if)#switchport trunk native vlan 1
S3(config-if)#int range f0/2, f0/4-24
S3(config-if-range)#switchport mode access
```

```
S3(config)#int f0/1
```

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

```
S3(config-if)#switchport access vlan 40
```

En el Switch 3 deshabilitar DNS lookup

```
S3>ena
```

```
S3#conf ter
```

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

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

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

Configuración S1

```
S1#conf ter
```

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

```
S1(config)#int range f0/2, f0/4-23
```

```
S1(config-if-range)#shut
```

Configuración S3

```
S3#conf ter
```

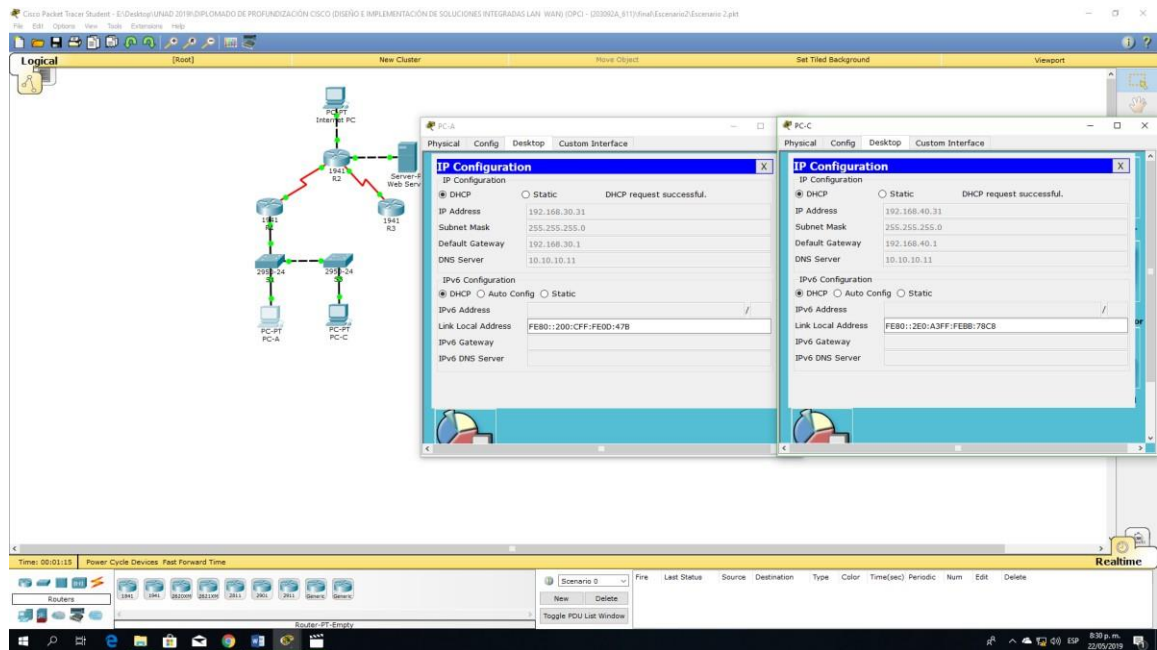
Enter configuration commands, one per line. End with CNTL/Z.

```
S3(config)#int range f0/2, f0/4-24
```

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

Implement DHCP and NAT for IPv4

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



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.

R1>ena

R1#conf ter

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(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
```

Configurar NAT en R2 para permitir que los hosts puedan salir a internet

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

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

```
R2>ena
```

```
R2#conf ter
```

```
R2(config)#user webuser privilege 15 secret cisco12345
```

```
R2(config)#ip nat inside source static 10.10.10.10 209.165.200.229
```

```
R2(config)#int g0/1
```

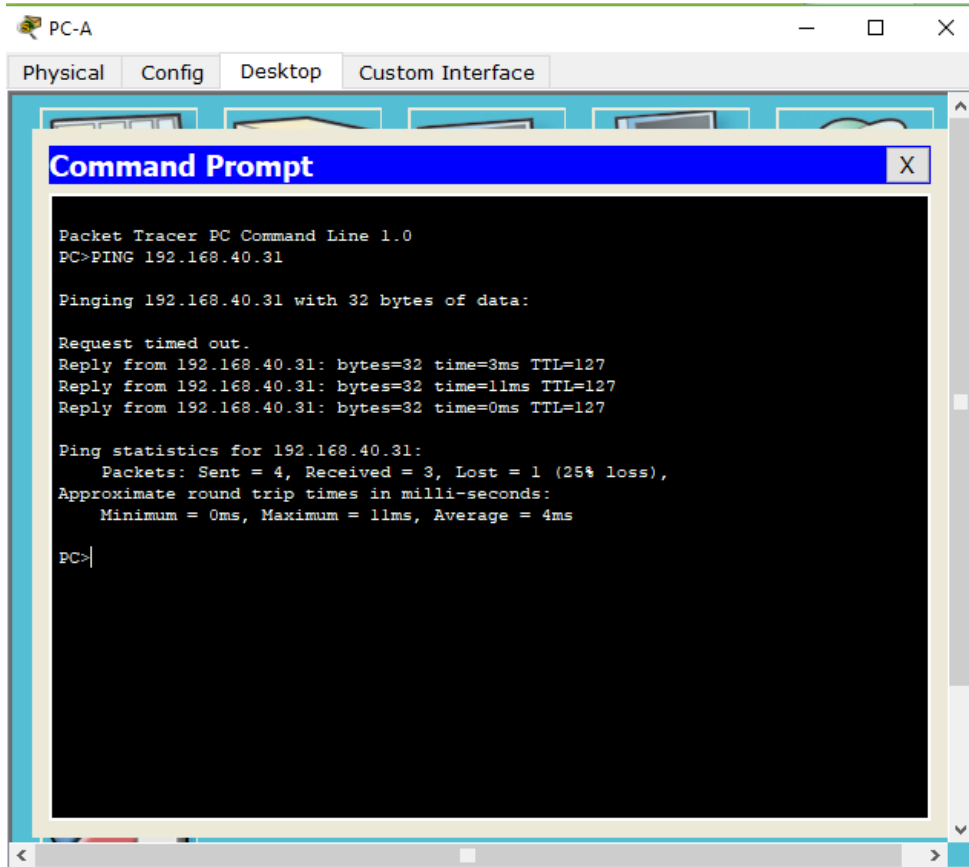
```
R2(config-if)#ip nat outside
```



```
R2(config)#int g0/0
R2(config-if)#ip nat inside
R2(config-if)#access-list 1 permit 192.168.30.0 0.0.0.255
R2(config-if)#access-list 1 permit 192.168.40.0 0.0.0.255
R2(config-if)#access-list 1 permit 192.168.4.0 0.0.3.255

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)#ip Access-list standard ADMIN-MANTENIMIENTO
R2(config-std-nacl)#permit host 172.31.21.1
R2(config)#line vty 0 4
R2(config-line)#access-class ADMIN-MANTENIMIENTO in
R2(config)#access-list 101 permit tcp any host 209.165.229.230 eq www
R2(config)#access-list 101 permit icmp any any echo-reply
R2(config)#int g0/1
R2(config-if)#ip access-group 101 in
R2(config)#int g0/0
R2(config-if)#ip access-group 101 out
R2(config)#int s0/0/0
R2(config-if)#ip access-group 101 out
R2(config)#int s0/0/1
R2(config-if)#ip access-group 101 out
```

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



The image shows a Packet Tracer PC Command Line window for PC-A. The window has tabs for Physical, Config, Desktop, and Custom Interface. The Command Prompt displays the following text:

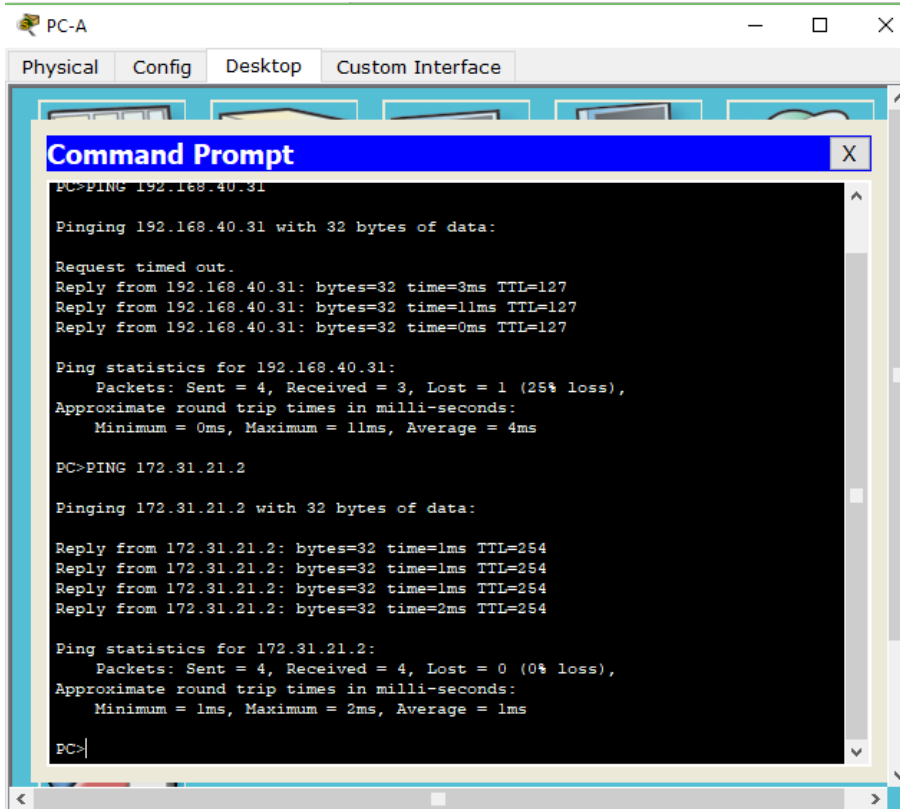
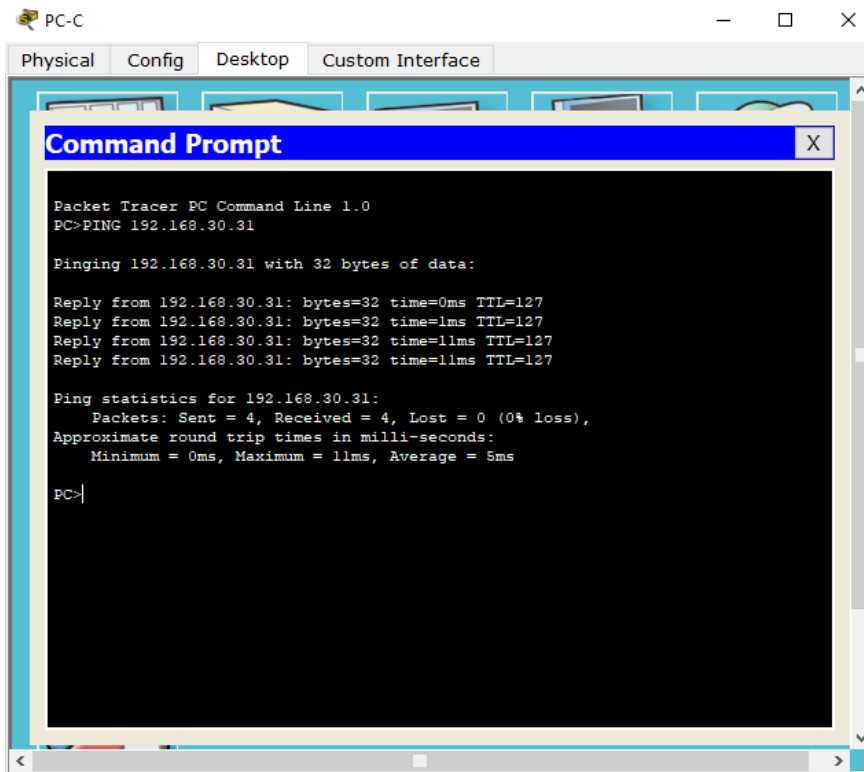
```
Packet Tracer PC Command Line 1.0
PC>PING 192.168.40.31

Pinging 192.168.40.31 with 32 bytes of data:

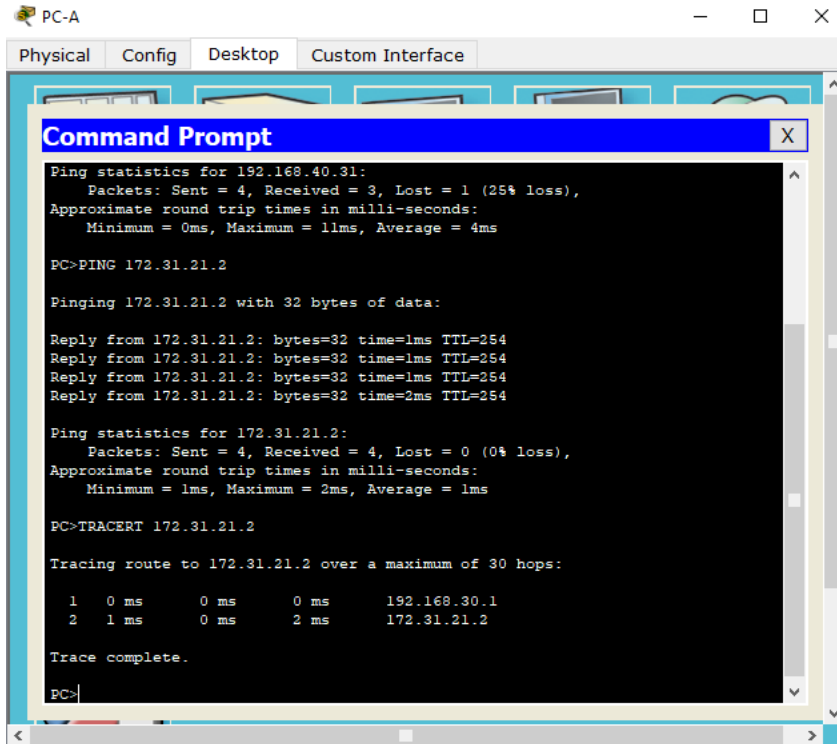
Request timed out.
Reply from 192.168.40.31: bytes=32 time=3ms TTL=127
Reply from 192.168.40.31: bytes=32 time=11ms TTL=127
Reply from 192.168.40.31: bytes=32 time=0ms TTL=127

Ping statistics for 192.168.40.31:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 11ms, Average = 4ms

PC>
```



# TRACEROUTE



PC-A

Physical Config Desktop Custom Interface

```
Command Prompt
Ping statistics for 192.168.40.31:
  Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
  Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 11ms, Average = 4ms

PC>PING 172.31.21.2

Pinging 172.31.21.2 with 32 bytes of data:

Reply from 172.31.21.2: bytes=32 time=1ms TTL=254
Reply from 172.31.21.2: bytes=32 time=1ms TTL=254
Reply from 172.31.21.2: bytes=32 time=1ms TTL=254
Reply from 172.31.21.2: bytes=32 time=2ms TTL=254

Ping statistics for 172.31.21.2:
  Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
  Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 2ms, Average = 1ms

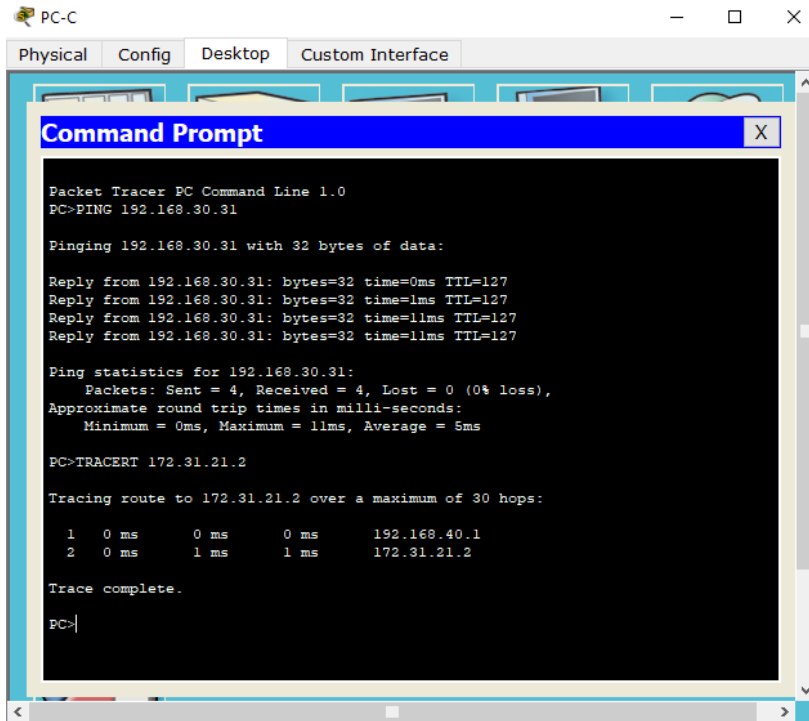
PC>TRACERT 172.31.21.2

Tracing route to 172.31.21.2 over a maximum of 30 hops:

  0  0 ms    0 ms    0 ms    192.168.30.1
  1  1 ms    0 ms    2 ms    172.31.21.2

Trace complete.

PC>
```



PC-C

Physical Config Desktop Custom Interface

```
Command Prompt
Packet Tracer PC Command Line 1.0
PC>PING 192.168.30.31

Pinging 192.168.30.31 with 32 bytes of data:

Reply from 192.168.30.31: bytes=32 time=0ms TTL=127
Reply from 192.168.30.31: bytes=32 time=1ms TTL=127
Reply from 192.168.30.31: bytes=32 time=11ms TTL=127
Reply from 192.168.30.31: bytes=32 time=11ms TTL=127

Ping statistics for 192.168.30.31:
  Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
  Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 11ms, Average = 5ms

PC>TRACERT 172.31.21.2

Tracing route to 172.31.21.2 over a maximum of 30 hops:

  0  0 ms    0 ms    0 ms    192.168.40.1
  1  0 ms    1 ms    1 ms    172.31.21.2

Trace complete.

PC>
```

## CONCLUSIONES

- En esta prueba de habilidades de curso de profundización en CISCO CCNA, se evidencio el conocimiento adquirido durante el curso, desarrollando los escenarios planteados como prueba final del curso.
- Para la configuración del protocolo de enrutamiento del OSPFv2 se debe crear el proceso de OSPF desde la configuración global con el comando “router ospf”, también se deben configurar los rangos de red “network área”, todas las interfaces que se incluyan mediante ese comando estarán participando en esa área de OSPF.
- Se deben configurar las NAT, también se debe dejar evidencias de la conexión por medio de los “ping”

## REFERENCIAS BIBLIOGRAFICAS

- DHCP. Principios de Enrutamiento y Conmutación. (2014) Recuperado de: <https://static-course-assets.s3.amazonaws.com/RSE50ES/module10/index.html#10.0.1.1>
- Chamorro Serna, L., Montaña Torres, O., Guzmán Pérez, E. H., Daza Navia, M. Y., & Castillo Ortiz, O. F. (2018). Diplomado de Profundización Cisco- Enrutamiento en soluciones de red.
- CISCO. (2014). Conceptos de Routing. Principios de Enrutamiento y Conmutación. Recuperado de: <https://static-course-assets.s3.amazonaws.com/RSE50ES/module4/index.html#4.0.1.1>
- CISCO. (2014). Enrutamiento entre VLANs. Principios de Enrutamiento y Conmutación. Recuperado de: <https://static-course-assets.s3.amazonaws.com/RSE50ES/module5/index.html#5.0.1.1>
- CISCO. (2014). Protocolos y comunicaciones de red. Fundamentos de Networking. Recuperado de: <https://static-course-assets.s3.amazonaws.com/ITN50ES/module2/index.html#3.0.1.1>