PRUEBA DE HABILIDADES PRACTICAS CCNA

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UNIVERSIDAD NACIONAL ABIERTA Y A DISTANCIA (UNAD)

ESCUELA DE CIENCIAS BASICAS, TECNOLOGIAS E INGENIERIAS

DIPLOMADO DE PROFUNDIZACIÓN CISCO

(DISEÑO E IMPLEMENTACIÓN DE SOLUCIONES INTEGRADAS LAN/WAN)

TURBO-ANTIOQUIA

2019

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CONTENIDO

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RESUMEN

Con este documento que contiene un planteamiento y desarrollo del Escenario1 y Escenario2 que corresponden a redes las cuales en su topología utilizan dispositivos Cisco. Para cada uno de los Escenarios, se configuraron e interconectaron cada uno de los dispositivos que compone la red, según los parámetros que se encuentran en las tablas de direccionamiento, además de configurar protocolos como DHCP, OSPFv2 , LISTAS DE CONTROL DE ACCESO Filtrado de paquetes, Tipos de ACL de IPv4 de Cisco, Máscaras wildcard en ACL, Determinar el permiso o la Denegación, Pautas generales para la creaciónde ACL, Pautas para la colocación de ACL y demás aspectos que hacen parte de la configuración de una Red.El primer paso consiste en el desarrollo del escenario 1 para lo cual se construye la red de acuerdo con la topología planteada, luego de esto el siguiente paso es establecer la configuración de direccionamiento IP. El segundo paso consiste en la configuración de DHCP para la asignación de direcciones IP de manera dinámica para los dispositivos que lo necesiten. El tercer paso consiste en configurar RIPv2 en los Router R1, R2 y R3. El cuarto paso consiste en configurar NAT en R1 lo cual permite la comunicación con la red externa. Por ultimo se verifica la conectividad entre los dispositivos, garantizando que se cumpla con lo planteado en este escenario.El segundo paso consiste en el desarrollo del escenario 2 para lo cual se construyela red de acuerdo con la topología planteada, la cual varía sustancialmente en relación con el escenario 1. Así como en el primer escenario el primer paso consiste en configurar el direccionamiento IP. En el segundo paso se configura OSPFv2 en los Routers R1, R2 y R3 configurando como pasivas todas las interfaces LAN, se verifica que la configuración de OSPF cumpla con lo planteado. Después se configuran las VLANs 30 que corresponde a Administración, 40 a Mercadeo y 200 a Mantenimiento, se verifica que las VLAN estén configuradas de acuerdo con los lineamientos establecidos. Lo siguiente es configurar DHCP y NAT y a continuación verificar que la comunicación entre los dispositivos sea correcta.

INTRODUCCIÓN

Si vemos nuestro país necesita líderes y emprendedores en área de la tic una de estas ramas de las Ingenieras es la de las Telecomunicaciones las redes de comunicación y el Internet facilitó la vida para todas las personas, empresas, organizaciones y demás actores de la humanidad que utilizan las redes para comunicarse e interactuar.

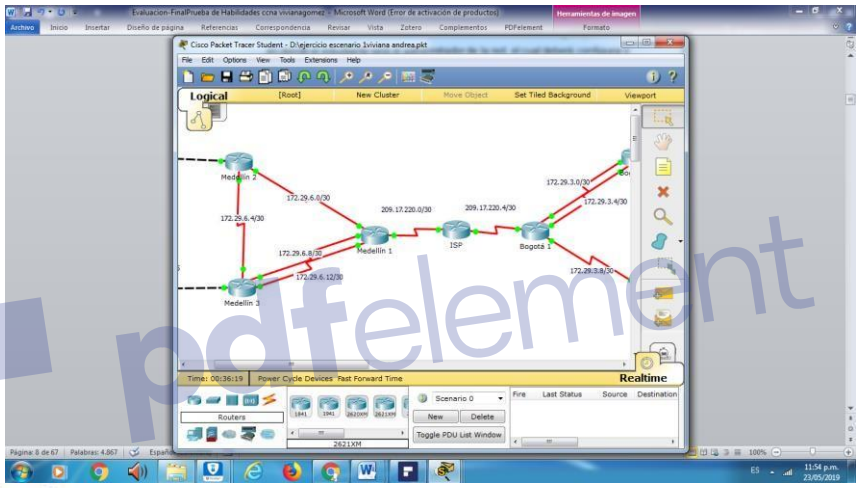
Con este trabajo quiero dar a conocer el desarrollo de unas prueba de habilidades practicas del curso Diplomado de Profundización CISCO en el cual se abordan temáticas como:

la configuración de los diferentes dispositivos de la marca CISCO que comprenden Routers, Switchs, DHCP, VLAN, enlaces troncales, subinterfaces, listas de control de acceso filtrado de paquetes, tipos de acl de ipv4 de cisco, máscaras wildcard en acl, determinar el permiso o la denegación, pautas generales para la creaciónde acl, pautas para la colocación de acl

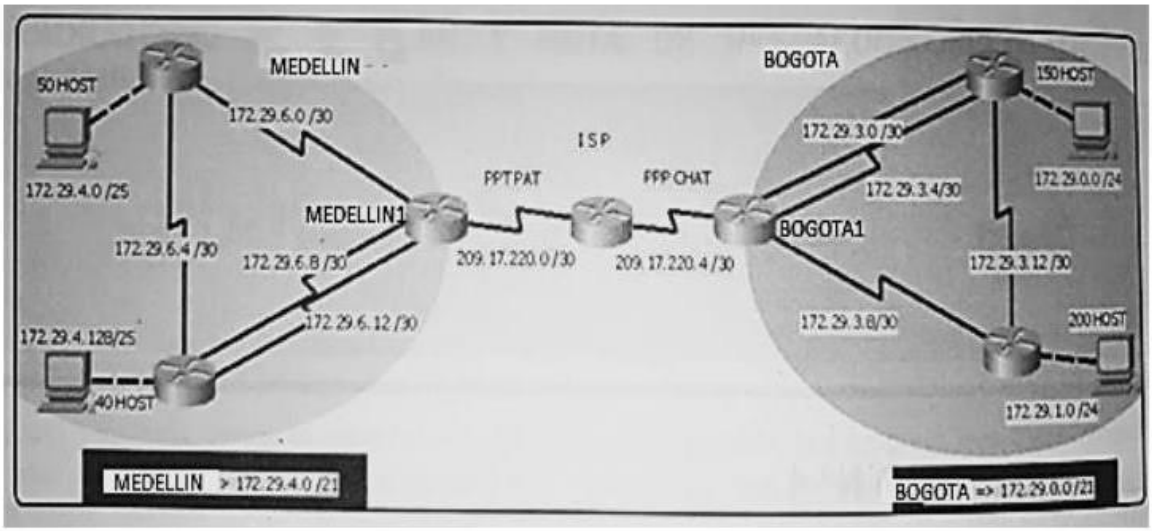
La tecnología de Cisco se puede utilizar en diferentes entornos como en el hogar, oficinas, centros comerciales, aeropuertos, entre otros. Es muy probable que cuando accedemos a una red inalámbrica o WIFI, lo estemos haciendo a través de un Router de Cisco, por la gran potencia y seguridad que ofrecen los dispositivos de esta compañía son sin duda la marca líder a nivel mundial en este sector.

Escenario1

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



1.1. (Caicedo, 2001)Desarrollo Escenario

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.

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

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

ISP

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

MEDELLIN 1

Medelin 1

```
Router>en
Router#conf t
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 s0/1/0
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)#

MEDELLIN 2

Router>en
Router#conf term
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)#
Router(config-if)#int s0/0/1
Router(config-if)#ip address 172.29.6.5 255.255.255.252
Router(config-if)#clock rate 4000000
Router(config-if)#no shutdown

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

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

MEDELLIN 3

Router>
Router>EN
Router#en
Router#conf term
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

%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

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

^

% Invalid input detected at '^' marker.
Router(config-if)#int s0/1/0
Router(config-if)#
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

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

BOGOTA1

Router>en
Router#conf term
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)#
%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 shutdow

%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
^
% Invalid input detected at '^' marker.
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)#no shutdow

%LINK-5-CHANGED: Interface Serial0/1/1, changed state to down
Router(config-if)#no shutdown
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
Router(config-if)#

Router(config-if)#no interface

^

% Invalid input detected at '^' marker.

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

Router(config-if)#

BOGOTA2

Router>en

Router#conf term

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

Router(config-if)#int s

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

^

% Invalid input detected at '^' marker.

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)#

Router(config-if)#int s0/01

%Invalid interface type and number
Router(config)#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)#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

BOGOTA3

Router>en
Router#conf term
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)#
%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

%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 172.29.0.1 255.255.255.0
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up

1.1.2. (Caicedo, 2001)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).

Medellin1>en
Medellin1#conf term
Enter configuration commands, one per line. End with CNTL/Z.
Medellin1(config)#no ip domain-lookup
Medellin1(config)#service password-encryption
Medellin1(config)#enable secret class
Medellin1(config)#banner motd #Unauthorized Acces is prohibites!#
Medellin1(config)#ip domain-name cisco.com
Medellin1(config)#line con 0
Medellin1(config-line)#passwork cisco
^
% Invalid input detected at '^' marker.
Medellin1(config-line)#password cisco
Medellin1(config-line)#login

Medellin1(config-line)#line vty 0 15
Medellin1(config-line)#password cisco
Medellin1(config-line)#login
Medellin1(config-line)#hostname Medellin1
Medellin1(config)#
Medellin1#
%SYS-5-CONFIG_I: Configured from console by console

MEDELLIN 2

outer>en
Router#conf term
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 #Unauthorized Acces is prohibites!#
Router(config)#ip domain-name cisco.com
Router(config)#line con 0
Router(config-line)#password cisco
Router(config-line)#login
Router(config-line)#line vty 0 15
Router(config-line)#password cisco
Router(config-line)#login
Router(config-line)#hostname Medellin2
Medellin2(config)#

MEDELLIN 3

Router>en
Router#conf term
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 #Unauthorized Acces is prohibites!#
Router(config)#ip domain-name cisco.com
Router(config)#line con 0
Router(config-line)#password cisco
Router(config-line)#login
Router(config-line)#line vty 0 15
Router(config-line)#password cisco
Router(config-line)#login
Router(config-line)#hostname Medellim 3
^
% Invalid input detected at '^' marker.
Router(config-line)#hostname Medellin3
Medellin3(config)#
Medellin3(config)#

Bogota 1

Bogota1>en
Bogota1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Bogota1(config)#no ip domain-lookup
Bogota1(config)#service password-encryption
Bogota1(config)#enable secret class
Bogota1(config)#banner motd #Unauthorized Acces is prohibites!#
Bogota1(config)#ip domain-name cisco.com
Bogota1(config)#line con 0
Bogota1(config-line)#password cisco
Bogota1(config-line)#login

Bogota1(config-line)#line vty 0 15
Bogota1(config-line)#password cisco
Bogota1(config-line)#login}
^
% Invalid input detected at '^' marker.
Bogota1(config-line)#login
Bogota1(config-line)#hotname Bogota1
^
% Invalid input detected at '^' marker.
Bogota1(config-line)#hostname Bogota1
Bogota1(config)#

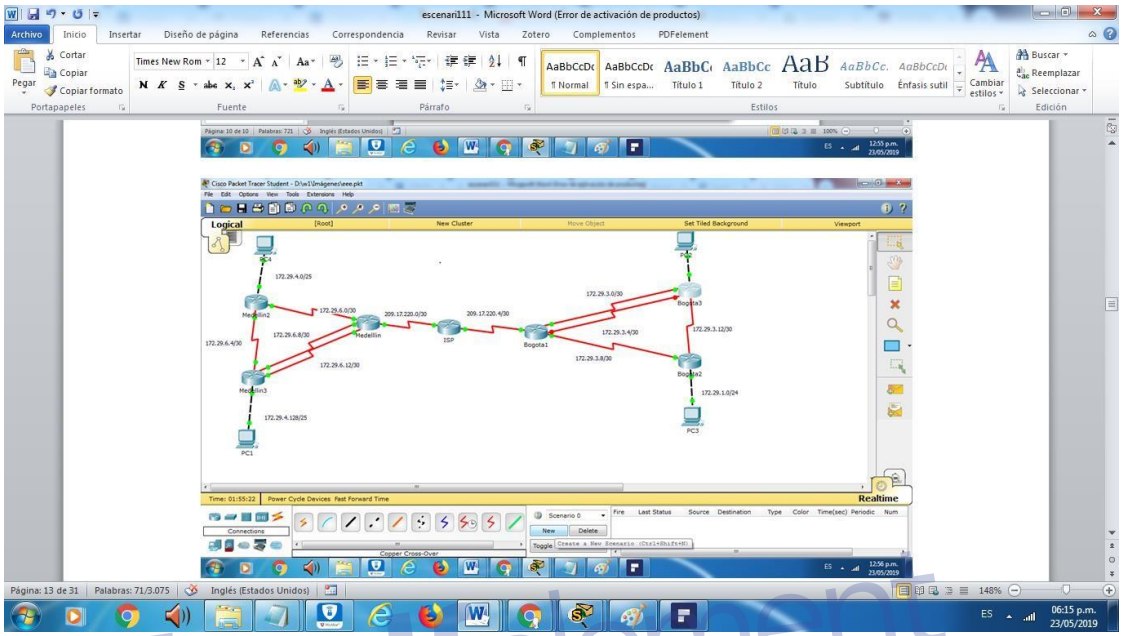
Bogota2

Router>EN
Router#en
Router#conf term
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 #Unauthorized Acces is prohibites!#
Router(config)#ip domain-name cisco.com
Router(config)#line con 0
Router(config-line)#password cisco
Router(config-line)#login
Router(config-line)#line vty 0 15
Router(config-line)#password cisco
Router(config-line)#login
Router(config-line)#hostname Bogota2
Bogota2(config)#

Bogota 3

```
Router>en
Router#conf t
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 #Unauthorized Acces is prohibites!#
Router(config)#ip domain-name cisco.com
Router(config)#line con 0
Router(config-line)#password cisco
Router(config-line)#login
Router(config-line)#line vty 0 15
Router(config-line)#password cisco
Router(config-line)#login
Router(config-line)#hostname Bogota3
Bogota3(config)#
```

1.1.3. (Caicedo, 2001)Realizar la conexión fisica de los equipos con base en la topología de red



1.1.4. (Caicedo, 2001)Configurar el enrutamiento en la red usando el protocolo RIP V2, declare la red principal, desactive la sumarización automática.

MEDELLIN 1

Router>en
Router#conf term
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)#nerwork 172.29.6.0

^

% Invalid input detected at '^' marker.

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

Router(config-router)#

MEDELLIN 2

Router>EN

Router#en

Router#conf term

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

Router(config)#

Router(config)#router rip

Router(config-router)#version 2

Router(config-router)#no auto-summary

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

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

% Invalid input detected

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

C 172.29.4.0/25 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

^

% Invalid input detected at '^' marker.Router(config-router)#passive-interface g0/0
Router(config-router)#

Medellin 3

Router>en
Router#conf term
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)#

BOGOTA1

Router>en
Router#conf term
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 172.29.3.8/30 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 172.29.3.8

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

Router(config-router)#

Router#

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

BOGOTA 2

Router>en

Router#conf t

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

Router(config)#router rip

Router(config-router)#version 2

Router(config-router)#no auto-summary

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

C 172.29.1.0/24 is directly connected, GigabitEthernet0/0

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

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

Router(config-router)#network 172.29.1.0

Router(config-router)#network 172.29.3.8

Router(config-router)#network 172.29.3.12

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

Router(config-router)#

Bogota 3

Router(config-router)#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)#

1.1.5. (Caicedo, 2001)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.

Router>en

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 not set

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, 00:00:13, 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 172.29.6.2, 00:00:13, Serial0/0/1

[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 172.29.6.8/30 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

1.1.6. (Caicedo, 2001)El router ISP deberá tener una ruta estática dirigida hacia cada red interna de Bogotá y Medellín para el caso se sumarizan las subredes de cada uno a /22.

Router(config)#ip route 172.29.0.0 255.255.252.0 209.17.220.6 Bogota1

2. (Caicedo, 2001)Verificar la tabla de enrutamiento en cada uno de los routers para comprobar las redes y sus rutas.

Router>en
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 = 1/5/10 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 0 percent (0/5)

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 0 percent (0/5)

Router#
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 0 percent (0/5)

Router#

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

2.2.3. 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.

3. (Caicedo, 2001)Deshabilitar la propagación del protocolo RIP.

31 . 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.

Esto se hizo cuando configure RIP

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

4. (Caicedo, 2001)Verificación del protocolo RIP.
    4.1 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.
    4.2 (Caicedo, 2001)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.

R/ esto se encuentra al principio del trabajo

5. (Caicedo, 2001)Configurar encapsulamiento y autenticación PPP.
    51 Según la topología se requiere que el enlace Medellín1 con ISP sea configurado con autenticación PAT.
    52 El enlace Bogotá1 con ISP se debe configurar con autenticación CHAT.

Router#en
Router#conf term
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname Medellin1
Medellin1(config)#username ISP password cisco
Medellin1(config)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to down
Parte 5: Configurar encapsulamiento y autenticacin PPP.
^
% Invalid input detected at '^' marker.
Medellin1(config)#
Medellin1(config)#a. Segn la topologa se requiere que el enlace Medelln1 con ISP sea configurado con autenticacin PAT.
^
% Invalid input detected at '^' marker.
Medellin1(config)#
Medellin1(config)#b. El enlace Bogot1 con ISP se debe configurar con autenticacin CHAT.
^
% Invalid input detected at '^' marker.
Medellin1(config)#int s0/0/0
Medellin1(config-if)#encapsulation ppp
Medellin1(config-if)#ppp authentication ppp
^
% Invalid input detected at '^' marker.
Medellin1(config-if)#ppp authentication pap

Medellin1(config-if)#ppp pap sent-username Medellin1 password cisco
Medellin1(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to up

Medellin1(config-if)#end
Medellin1#
%SYS-5-CONFIG_I: Configured from console by console

Medellin1#ping 209.17.220.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 209.17.220.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 5/9/17 ms

Medellin1#ping 209.17.220.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 209.17.220.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/7/18 ms

Router#en
Router#conf term
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname ISP
ISP(config)#username Medellin1 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 aauthentication pa
bogota
% Invalid input detected at '^' marker.
ISP(config-if)#ppp authentication pap
ISP(config-if)#ppp pap ?
sent-username Set outbound PAP username
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 up

ISP(config-if)#exit
ISP(config)#username Bogota1 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

Bogota1>en
Bogota1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Bogota1(config)#hostname Bogota1
Bogota1(config)#username ISP password cisco

Bogota1(config)#int s0/0/0
Bogota1(config-if)#encapsulation ppp
Bogota1(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to up

Bogota1(config-if)#ppp authentication chap
Bogota1(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to down

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

Bogota1(config-if)#

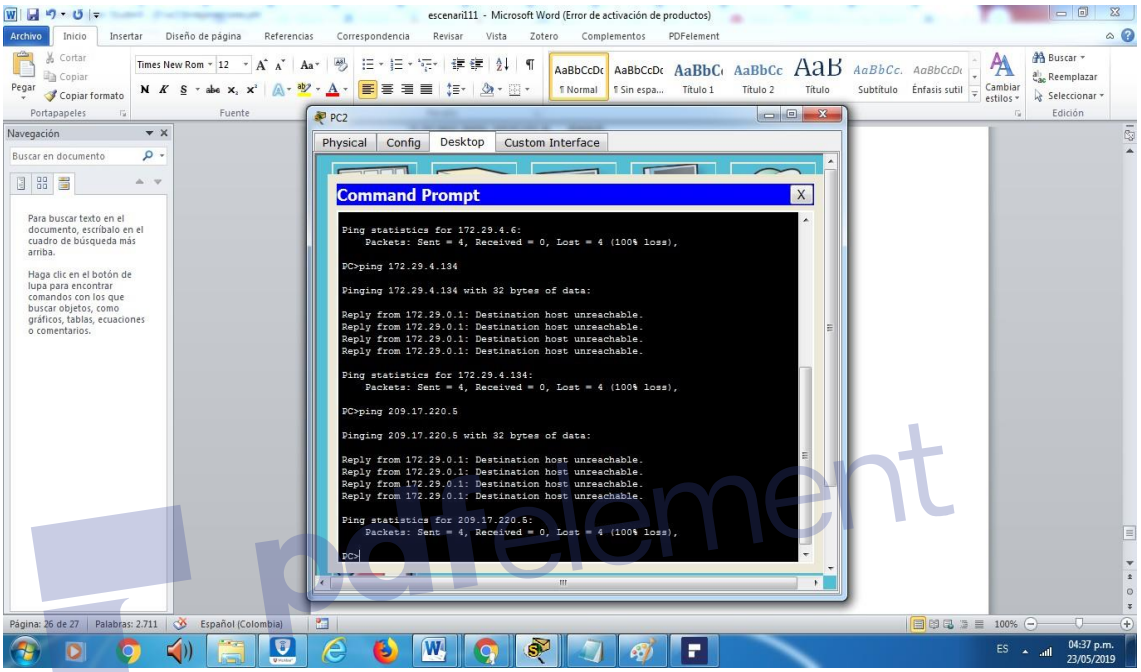
6. (Caicedo, 2001) Configuración de PAT.

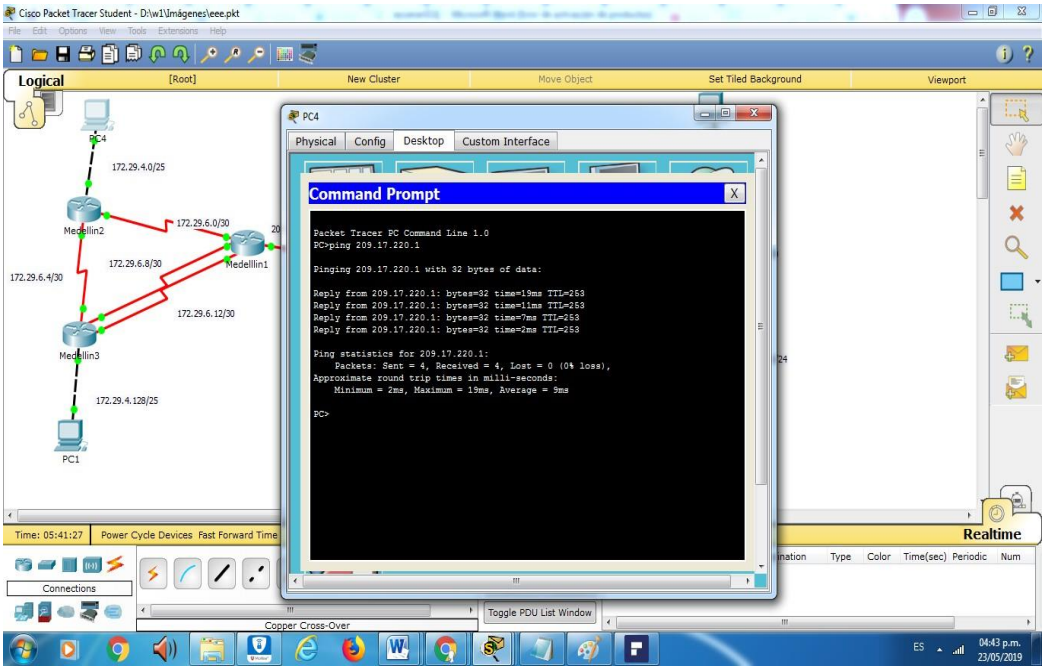
6.1.1. En la topología, si se activa NAT en cada equipo de salida (Bogotá1 y Medellín1), los routers internos de una ciudad no podrán llegar hasta los routers internos en el otro extremo, sólo existirá comunicación hasta los routers Bogotá1, ISP y Medellín1.

```
Medellin1>en
Medellin1#conf term
Enter configuration commands, one per line. End with CNTL/Z.
Medellin1(config)#ip nat inside source list 1 interface s0/0/0 overload
Medellin1(config)#acces-list 1 permit
^
% Invalid input detected at '^' marker.
Medellin1(config)#access-list 1 permit 172.29.4.0 0.0.3.255
Medellin1(config)#int s0/0/0
Medellin1(config-if)#ip nat outside
Medellin1(config-if)#int s0/0/1
Medellin1(config-if)#int nat inside
^
% Invalid input detected at '^' marker.
Medellin1(config-if)#ip nat inside
Medellin1(config-if)#int s0/1/0
Medellin1(config-if)#ip nat inside
Medellin1(config-if)#int s0/1/1
Medellin1(config-if)#ip nat inside

    Medellin1(config-if)#
```

6.1.2 (Caicedo, 2001)Después de verificar lo indicado en el paso anterior proceda a configurar el NAT en el router Medellín1. Compruebe que la traducción de direcciones indique las interfaces de entrada y de salida. Al realizar una prueba de ping, la dirección debe ser traducida automáticamente a la dirección de la interfaz serial 0/1/0 del router Medellín1, cómo diferente puerto





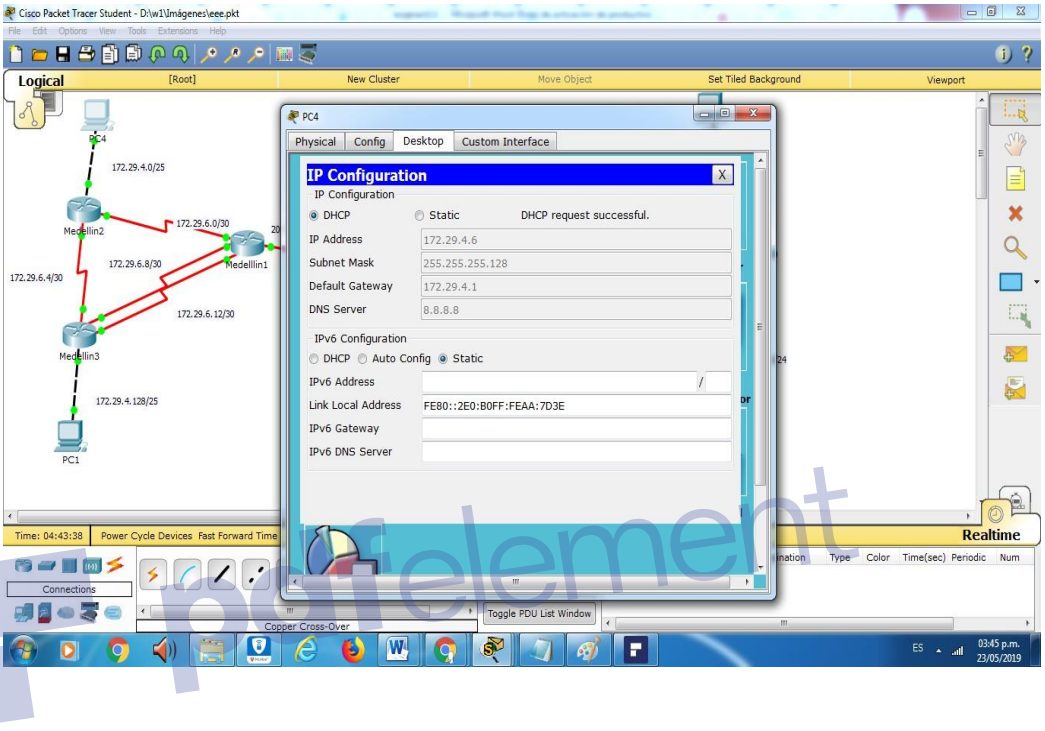
(Caicedo, 2001)6.1.3. Proceda a configurar el NAT en el router Bogotá1. Compruebe que la traducción de direcciones indique las interfaces de entrada y de salida. Al realizar una prueba de ping, la dirección debe ser traducida automáticamente a la dirección de la interfaz serial 0/1/0 del router Bogotá1, cómo diferente puerto

```
Router>en
Router#conf term
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

    Router(config)#
```

7. (Caicedo, 2001)Configuración del servicio DHCP.

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



Router>en

Router#conf term

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

Router(config)#int g 0/0

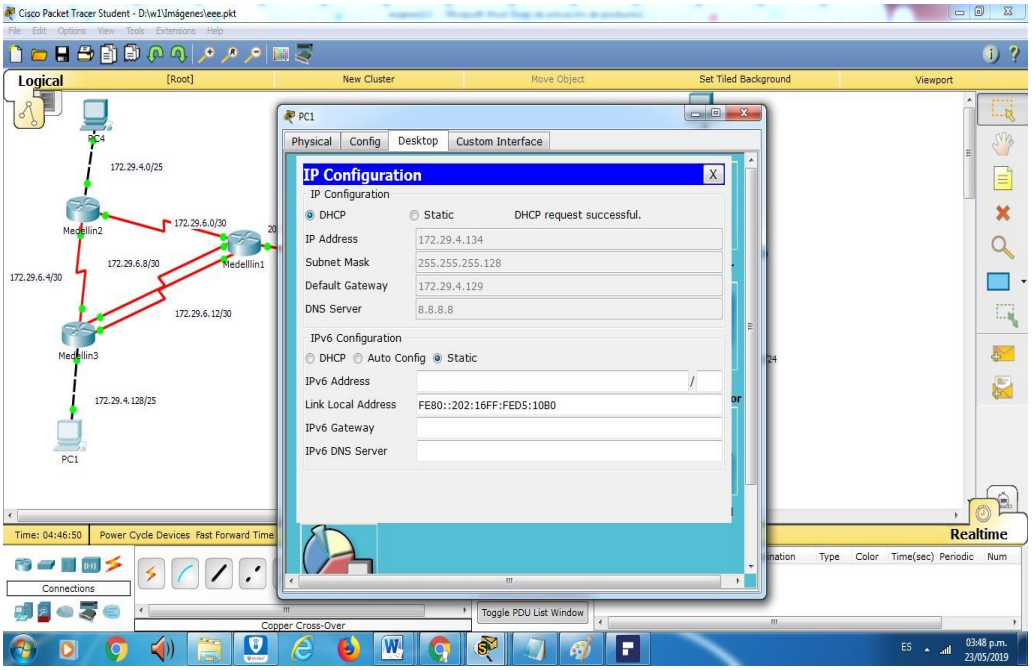
Router(config-if)#int g0/0

Router(config-if)#ip helper-address

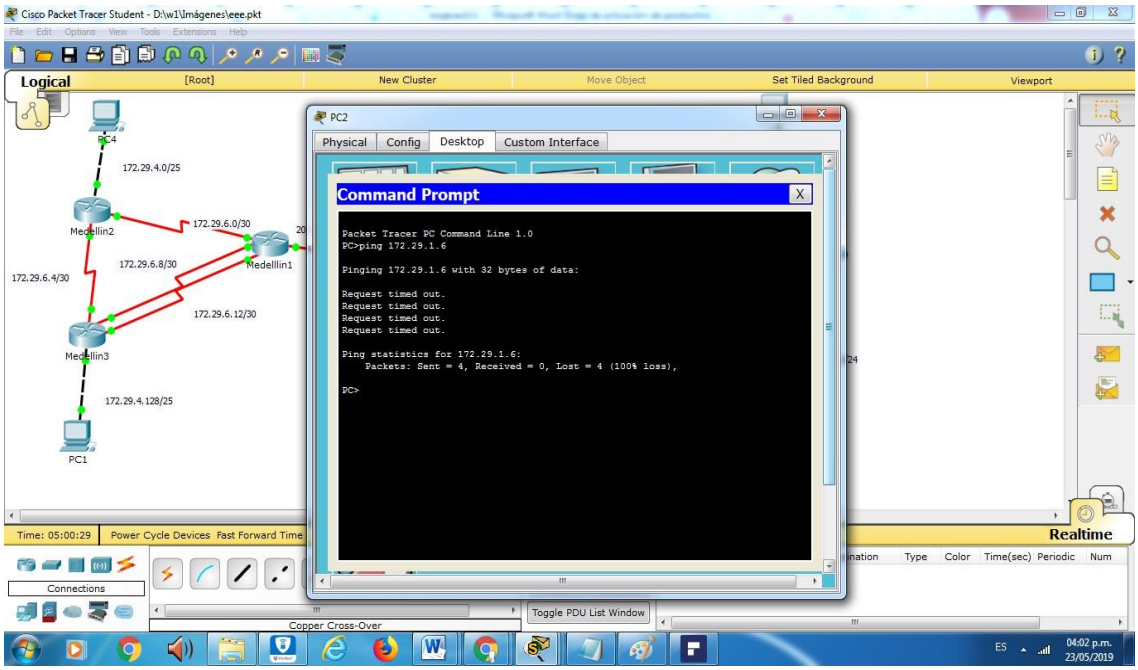
% Incomplete command.

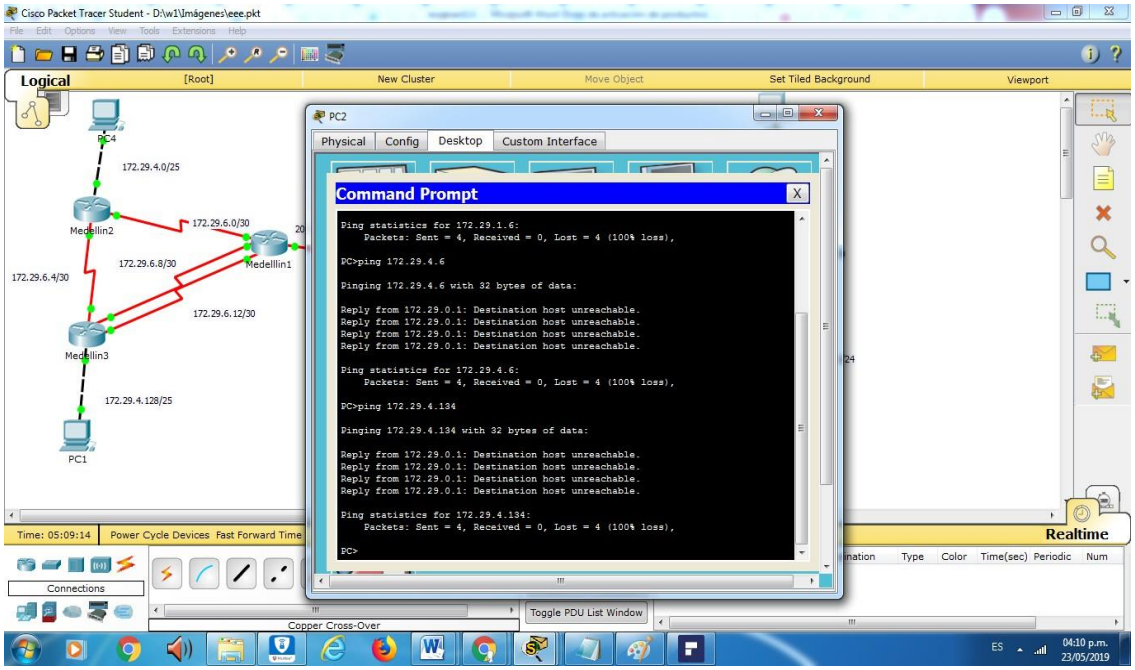
Router(config-if)#ip helper-address 172.29.6.5

Router(config-if)#



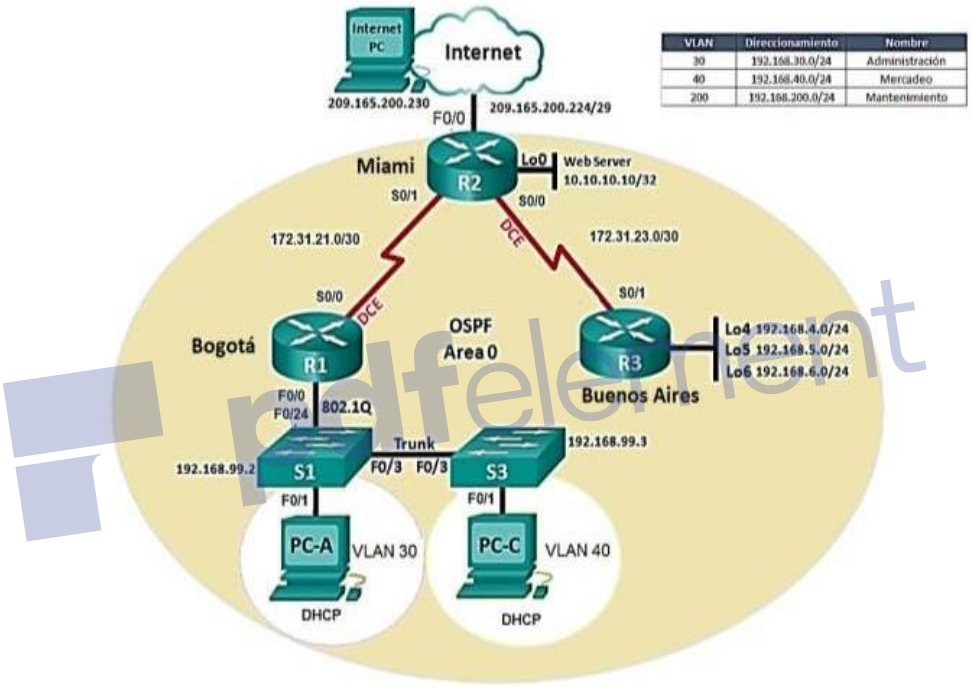
- El router Medellín3 deberá habilitar el paso de los mensajes broadcast hacia la IP del router Medellín2.
- Configurar la red Bogotá2 y Bogotá3 donde el router Medellín2 debe ser el servidor DHCP para ambas redes Lan.
- Configure el router Bogotá1 para que habilite el paso de los mensajes Broadcast hacia la IP del router Bogotá2.



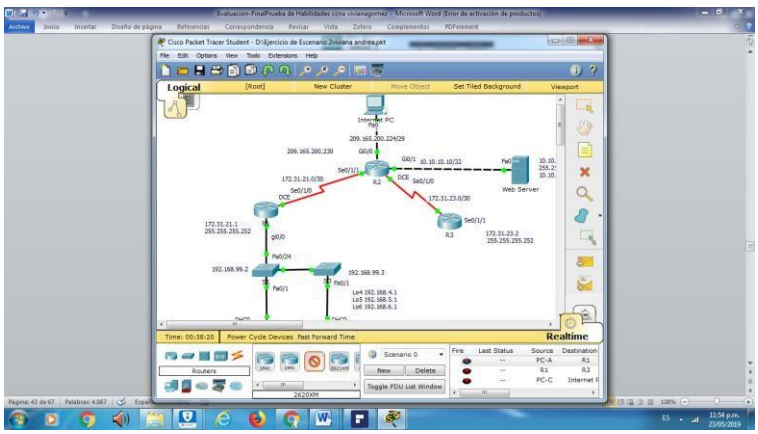

Cisco Packet Tracer Student - D:\w1\Imágenes\eee.pkt
Logical
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
PC4
172.29.4.0/25
Medellin2
172.29.6.0/30
Medelllin1
172.29.6.8/30
172.29.6.4/30
172.29.6.12/30
Medellin3
172.29.4.128/25
PC1
PC2
Physical
Config
Desktop
Custom Interface
Command Prompt
Ping statistics for 172.29.1.6:
Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
PC>ping 172.29.4.6
Pinging 172.29.4.6 with 32 bytes of data:
Reply from 172.29.0.1: Destination host unreachable.
Reply from 172.29.0.1: Destination host unreachable.
Reply from 172.29.0.1: Destination host unreachable.
Reply from 172.29.0.1: Destination host unreachable.
Ping statistics for 172.29.4.6:
Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
PC>ping 172.29.4.134
Pinging 172.29.4.134 with 32 bytes of data:
Reply from 172.29.0.1: Destination host unreachable.
Reply from 172.29.0.1: Destination host unreachable.
Reply from 172.29.0.1: Destination host unreachable.
Reply from 172.29.0.1: Destination host unreachable.
Ping statistics for 172.29.4.134:
Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
PC>
Time: 05:09:14
Power Cycle Devices
Fast Forward Time
Realtime
Connections
Copper Cross-Over
Toggle PDU List Window
04:10 p.m.
23/05/2019

8. 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.



VLAN	Direccionamiento	Nombre
30	192.168.30.0/24	Administración
40	192.168.40.0/24	Mercadeo
200	192.168.200.0/24	Mantenimiento



81 (Caicedo, 2001)Configurar el direccionamiento IP acorde con la topología de red para cada uno de los dispositivos que forman parte del escenario

Al configurar el direccionamiento IP en los router R1, R2 y R3, se observamos la conectividad, esto se identifica por los triángulos verdes que se ven sobre las líneas de conexión, a diferencia de la figura en la cual los triángulos son rojos, debido

a que no hay comunicación por la falta de direccionamiento IP.

Configuración de R1Bogota

```
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname R1
R1(config)#interface s0/0/0
R1(config-if)#ip address 172.31.21.1 255.255.255.252
R1(config-if)#no shutdown
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to down
R1(config-if)#ip route 0.0.0.0 0.0.0.0 s0/0/0
R1(config)#
R1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#interface f0/0
R1(config-if)#ip address 192.168.99.1 255.255.255.0
R1(config-if)#no shutdown
R1(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed
state to up
```

Configuración de R2Miami

```
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname R2
R2(config)#interface s0/0/1
R2(config-if)#ip address 172.31.21.2 255.255.255.252
R2(config-if)#no shutdown
R2(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/1, changed state to up
R2(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/1, changed state
to up
R2(config-if)#exit
R2(config)#interface s0/0/0
R2(config-if)#ip address 172.31.23.1 255.255.255.252
R2(config-if)#no shutdown
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to down
R2(config-if)#exit
R2(config)#interface F0/0
R2(config-if)#ip address 209.165.200.225 255.255.255.248
R2(config-if)#no shutdown
R2(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed
state to up
R2(config-if)#exit
R2(config)#interface F0/1
R2(config-if)#ip address 10.10.10.1 255.255.255.0
R2(config-if)#no shutdown
R2(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed
state to up
R2(config-if)#exit
R2(config)#ip route 0.0.0.0 0.0.0.0 f0/0
```

Configuración de R3Buenos Aires

```
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname R3
R3(config)#interface s0/0/1
R3(config-if)#ip address 172.31.23.2 255.255.255.252
R3(config-if)#no shutdown
R3(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/1, changed state to up
R3(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/1, changed state
to up
R3(config-if)#exit
R3(config)#interface loopback 4
R3(config-if)#
%LINK-5-CHANGED: Interface Loopback4, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback4, changed state
to up
R3(config-if)#ip address 192.168.4.1 255.255.255.0
R3(config-if)#exit
R3(config)#interface loopback 5
R3(config-if)#
%LINK-5-CHANGED: Interface Loopback5, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback5, changed state
to up
R3(config-if)#ip address 192.168.5.1 255.255.255.0
R3(config-if)#exit
R3(config)#interface loopback 6
R3(config-if)#
%LINK-5-CHANGED: Interface Loopback6, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback6, changed state
to up
R3(config-if)#ip address 192.168.6.1 255.255.255.0
R3(config-if)#exit
R3(config)#ip route 0.0.0.0 0.0.0.0 s0/0/1
```

8.1.2. (Caicedo, 2001) **Configurar el protocolo de enrutamiento OSPFv2 bajo los siguientes criterios:**

Aquí configuro el protocolo OSPFv2 en los Routers R1, R2 y R3 configurando como pasivas todas las interfaces LAN, se establece el ancho de banda en 256 kb/s para los enlaces seriales y se ajusta el costo en la métrica de S0/0 en 9500.

- Configuración de OSPF en R1Bogota
- Configuración OSPFv2 bajo criterios de la tabla 4
- Se configura el protocolo OSPFv2 en los Routers R1, R2 y R3 configurando como
- pasivas todas las interfaces LAN, se establece el ancho de banda en 256 kb/s para
- los enlaces seriales y se ajusta el costo en la métrica de S0/0 en 9500.

OSPFv2 area 0

Configuration Item or Task	Specification
Router ID R1	1.1.1.1

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

```
R1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#router ospf 10
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 192.168.99.0 0.0.0.255 area 0
R1(config-router)#passive-interface f0/0
R1(config-router)#interface s0/0/1
R1(config-if)#bandwidth 256
R1(config-if)#interface s0/0/0
R1(config-if)#bandwidth 256
R1(config-if)#ip ospf cost 9500
```

Configuración de OSPF en R2Miami

```
R2>en
R2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#router ospf 10
R2(config-router)#router-id 5.5.5.5
R2(config-router)#network 172.31.21.0 0.0.0.3 area 0
R2(config-router)#network 172
R2(config-router)#network 172.31.23.0 0.0.0.3 area 0
R2(config-router)#network 10.10.10.0 0.0.0.255 area 0
R2(config-router)#passive-interface f0/0
R2(config-router)#passive-interface f0/1
R2(config-router)#interface s0/0/1
R2(config-if)#bandwidth 256
R2(config-if)#ip ospf cost 9500
```


Configuración de OSPF en R3 Buenos Aires

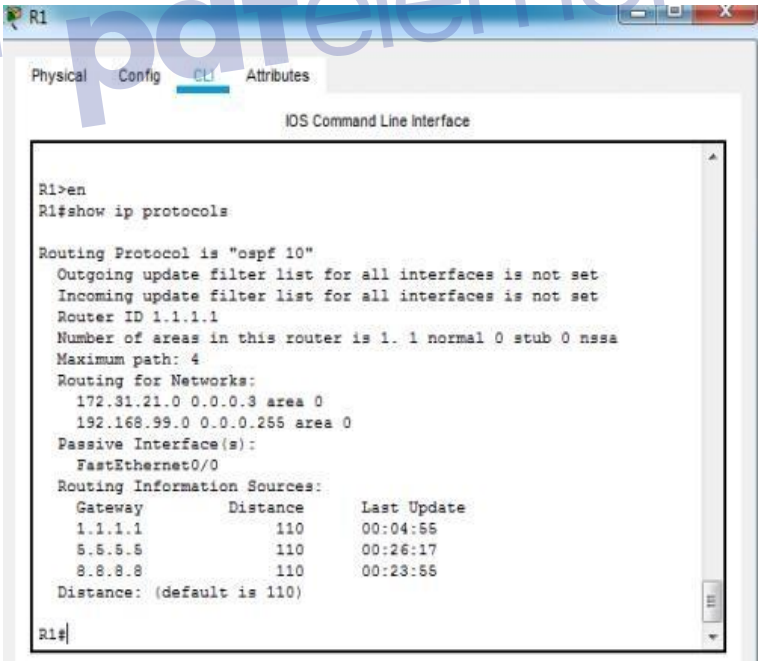
```
R3>en
R3#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R3(config)#router ospf 10
R3(config-router)#router-id 8.8.8.8
R3(config-router)#network 172.31.23.0 0.0.0.3 area 0
R3(config-router)#network 192.168.4.0 0.0.0.255 area 0
R3(config-router)#network 192.168.5.0 0.0.0.255 area 0
R3(config-router)#network 192.168.6.0 0.0.0.255 area 0
R3(config-router)#passive-interface lo4
R3(config-router)#passive-interface lo5
R3(config-router)#passive-interface lo6
R3(config-router)#interface s0/0/1
R3(config-if)#bandwidth 256
```

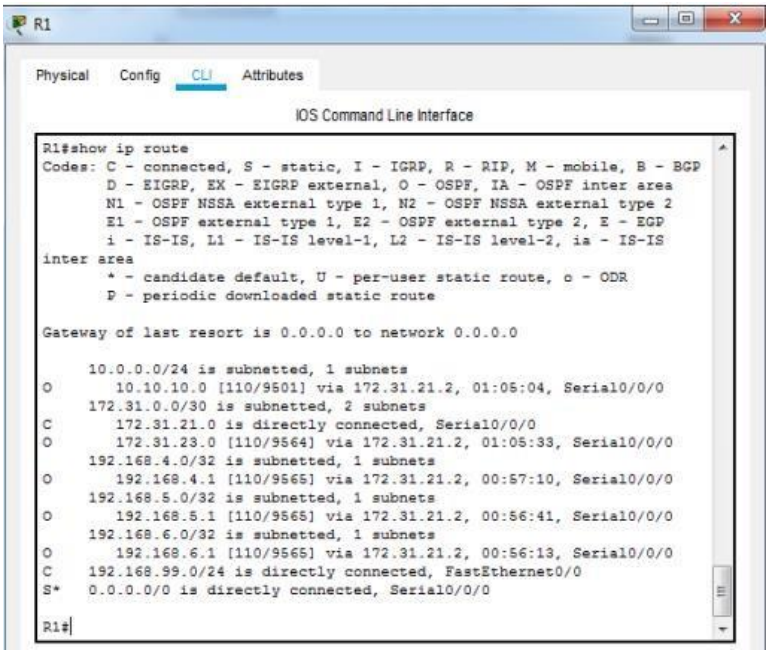
9. (Caicedo, 2001)**Verificar información de OSPF**

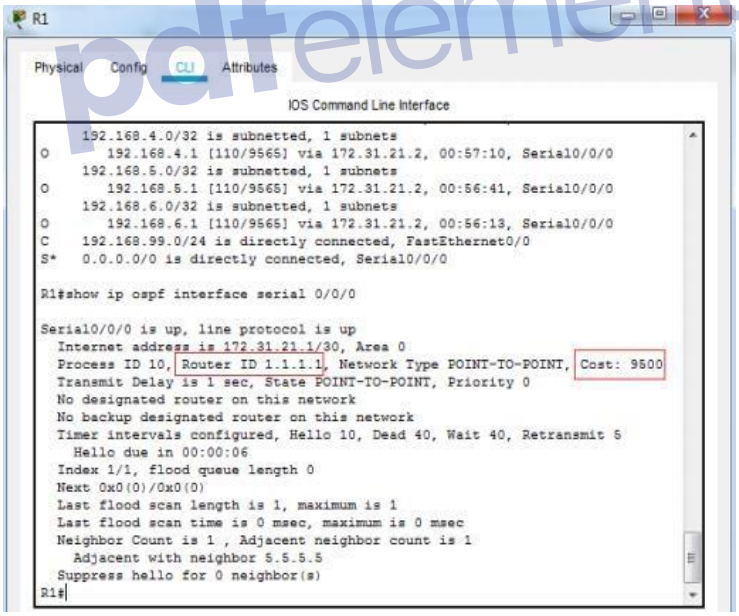
Se hace la verificación de la configuración que consiste en constatar en cada uno de los Routers (R1, R2, R3) que los comandos y parámetros introducidos se estén ejecutando correctamente, para ellos se emplean comandos como show ip protocols, show ip route, show ip ospf interface serial 0/0/0, show ip ospf neighbor, entre otros.

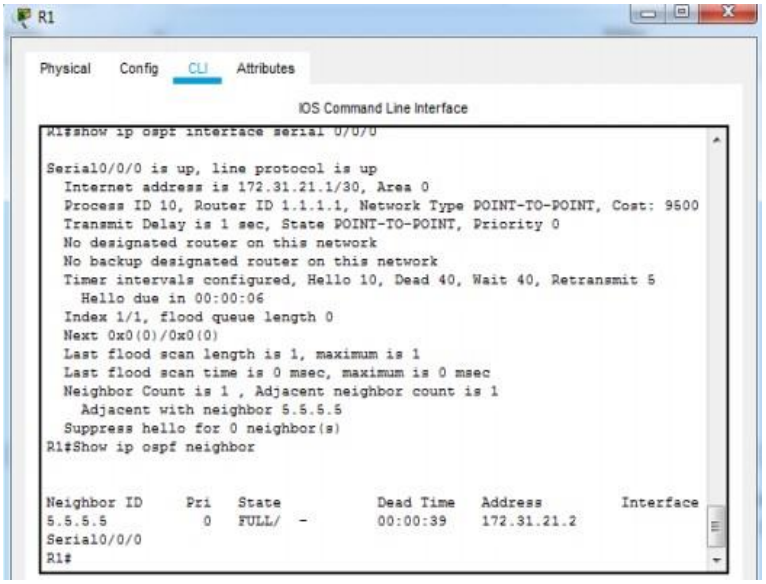
- Visualizar tablas de enrutamiento y routers conectados por OSPFv2
- Visualizar lista resumida de interfaces por OSPF en donde se ilustre el costo de cada interface
- Visualizar el OSPF Process ID, Router ID, Address summarizations, Routing Networks, and passive interfaces configuradas en cada router.

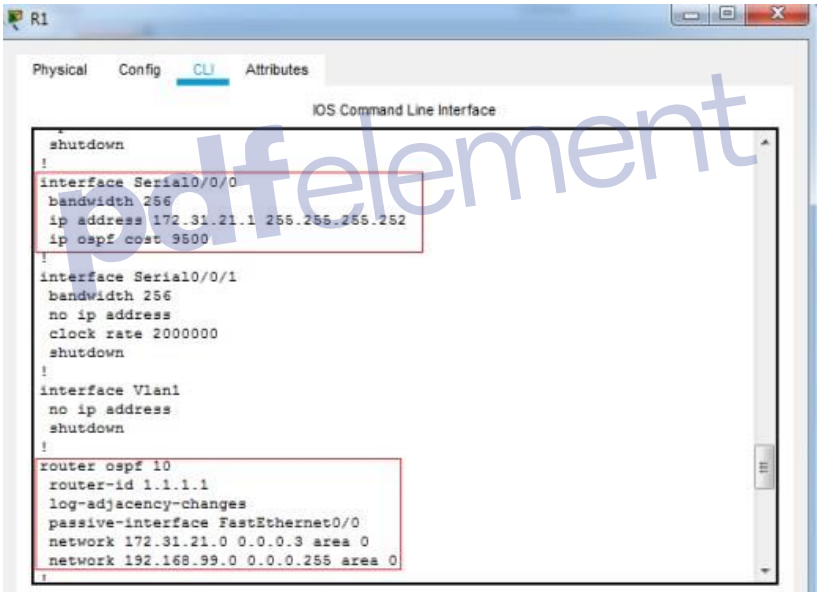
Verificación de R1



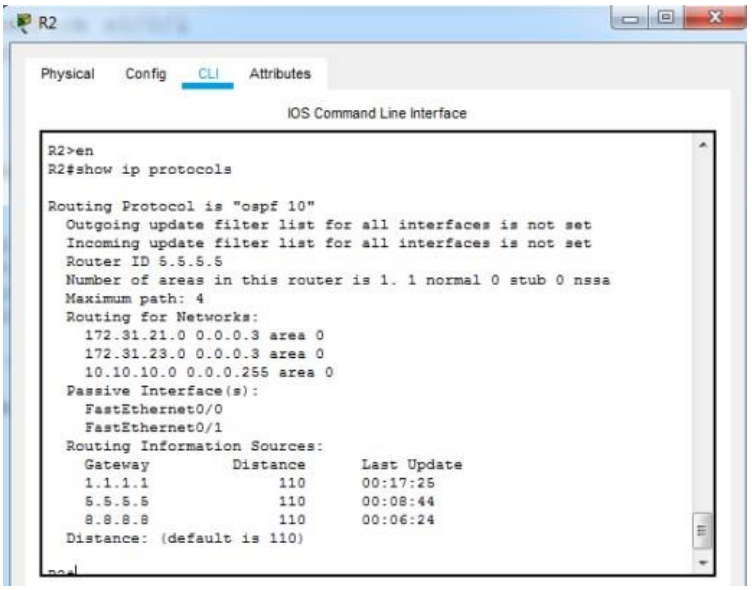

R1
Physical
Config
CLI
Attributes
IOS Command Line Interface
R1#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 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 0.0.0.0 to network 0.0.0.0
10.0.0.0/24 is subnetted, 1 subnets
O 10.10.10.0 [110/9501] via 172.31.21.2, 01:05:04, Serial0/0/0
172.31.0.0/30 is subnetted, 2 subnets
C 172.31.21.0 is directly connected, Serial0/0/0
O 172.31.23.0 [110/9564] via 172.31.21.2, 01:05:33, Serial0/0/0
192.168.4.0/32 is subnetted, 1 subnets
O 192.168.4.1 [110/9565] via 172.31.21.2, 00:57:10, Serial0/0/0
192.168.5.0/32 is subnetted, 1 subnets
O 192.168.5.1 [110/9565] via 172.31.21.2, 00:56:41, Serial0/0/0
192.168.6.0/32 is subnetted, 1 subnets
O 192.168.6.1 [110/9565] via 172.31.21.2, 00:56:13, Serial0/0/0
C 192.168.99.0/24 is directly connected, FastEthernet0/0
S* 0.0.0.0/0 is directly connected, Serial0/0/0
R1#

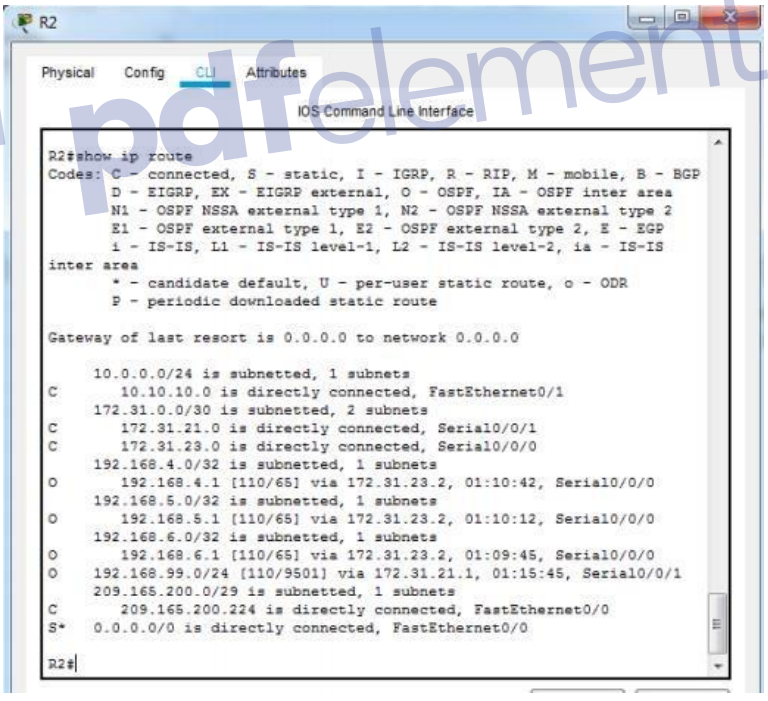

R1
Physical
Config
CLI
Attributes
IOS Command Line Interface
192.168.4.0/32 is subnetted, 1 subnets
O 192.168.4.1 [110/9565] via 172.31.21.2, 00:57:10, Serial0/0/0
192.168.5.0/32 is subnetted, 1 subnets
O 192.168.5.1 [110/9565] via 172.31.21.2, 00:56:41, Serial0/0/0
192.168.6.0/32 is subnetted, 1 subnets
O 192.168.6.1 [110/9565] via 172.31.21.2, 00:56:13, Serial0/0/0
C 192.168.99.0/24 is directly connected, FastEthernet0/0
S* 0.0.0.0/0 is directly connected, Serial0/0/0
R1#show ip ospf interface serial 0/0/0
Serial0/0/0 is up, line protocol is up
Internet address is 172.31.21.1/30, Area 0
Process ID 10, Router ID 1.1.1.1, 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 00:00:06
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 1 , Adjacent neighbor count is 1
Adjacent with neighbor 5.5.5.5
Suppress hello for 0 neighbor(s)
R1#

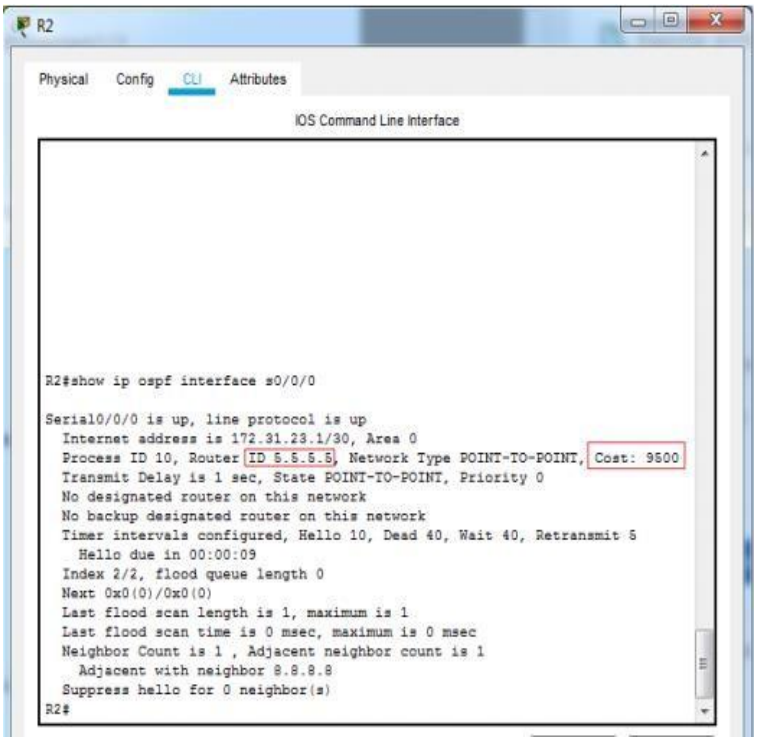

R1
Physical
Config
CLI
Attributes
IOS Command Line Interface
R1#show ip ospf interface serial 0/0/0
Serial0/0/0 is up, line protocol is up
Internet address is 172.31.21.1/30, Area 0
Process ID 10, Router ID 1.1.1.1, Network Type POINT-TO-POINT, Cost: 9500
Transmit Delay is 1 sec, State POINT-TO-POINT, 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 00:00:06
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 1 , Adjacent neighbor count is 1
Adjacent with neighbor 5.5.5.5
Suppress hello for 0 neighbor(s)
R1#Show ip ospf neighbor
Neighbor ID Pri State Dead Time Address Interface
5.5.5.5 0 FULL/ - 00:00:39 172.31.21.2
Serial0/0/0
R1#

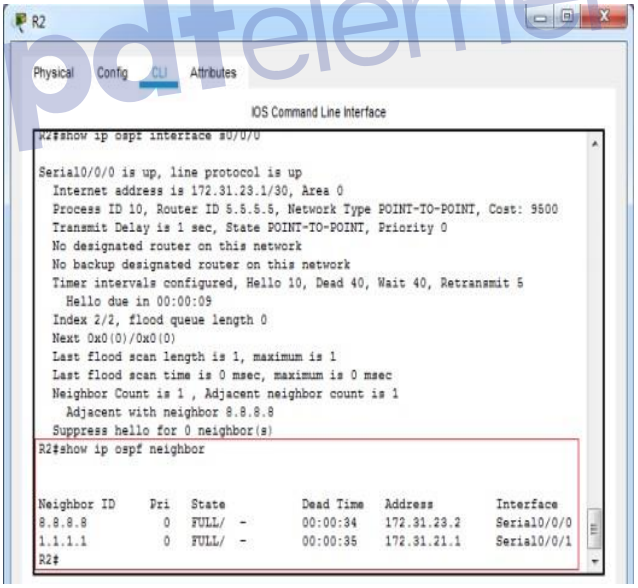

R1
Physical
Config
CLI
Attributes
IOS Command Line Interface
shutdown
!
interface Serial0/0/0
bandwidth 256
ip address 172.31.21.1 255.255.255.252
ip ospf cost 9500
!
interface Serial0/0/1
bandwidth 256
no ip address
clock rate 2000000
shutdown
!
interface Vlan1
no ip address
shutdown
!
router ospf 10
router-id 1.1.1.1
log-adjacency-changes
passive-interface FastEthernet0/0
network 172.31.21.0 0.0.0.3 area 0
network 192.168.99.0 0.0.0.255 area 0
!

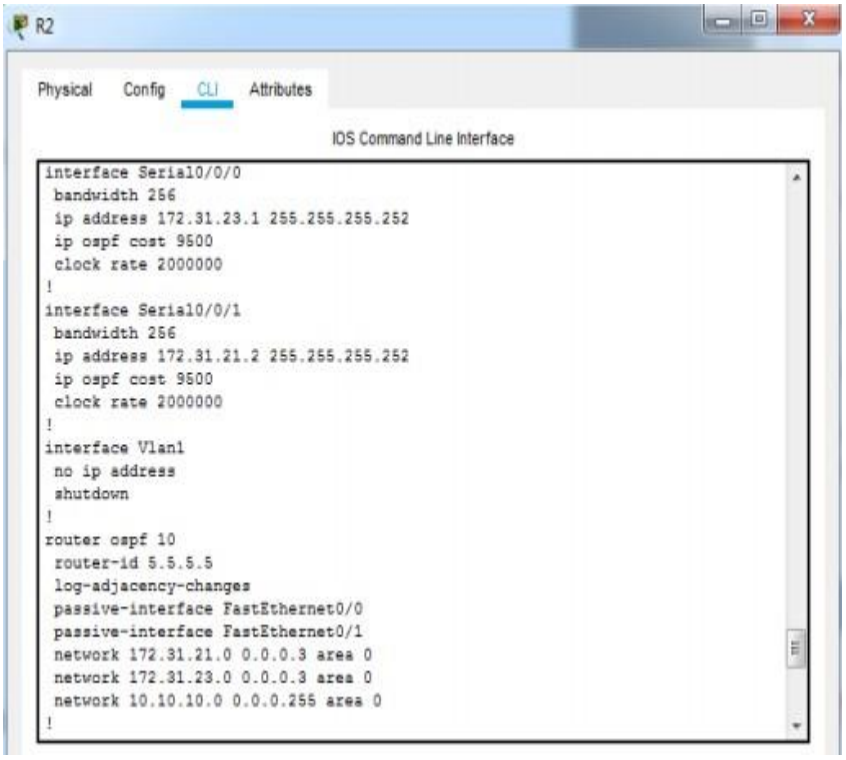
Verificación de R2



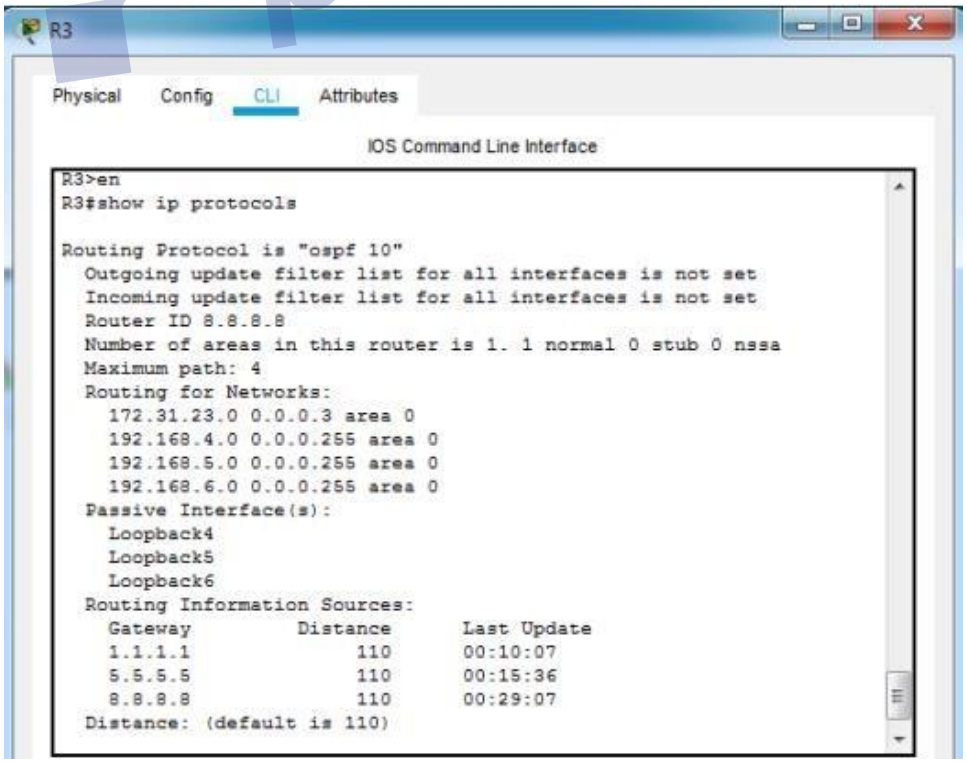


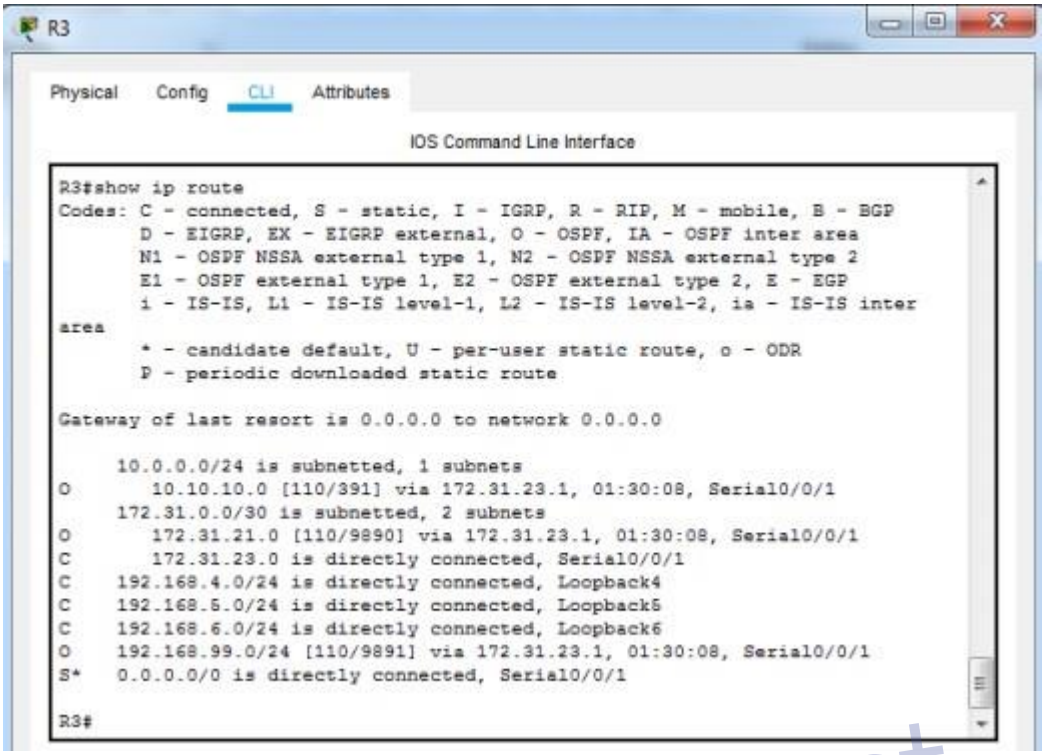

R2
Physical
Config
CLI
Attributes
IOS Command Line Interface
R2#show ip ospf interface s0/0/0
Serial0/0/0 is up, line protocol is up
Internet address is 172.31.23.1/30, Area 0
Process ID 10, Router ID 5.5.5.5, Network Type POINT-TO-POINT, Cost: 9500
Transmit Delay is 1 sec, State POINT-TO-POINT, Priority 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 00:00:09
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)
R2#

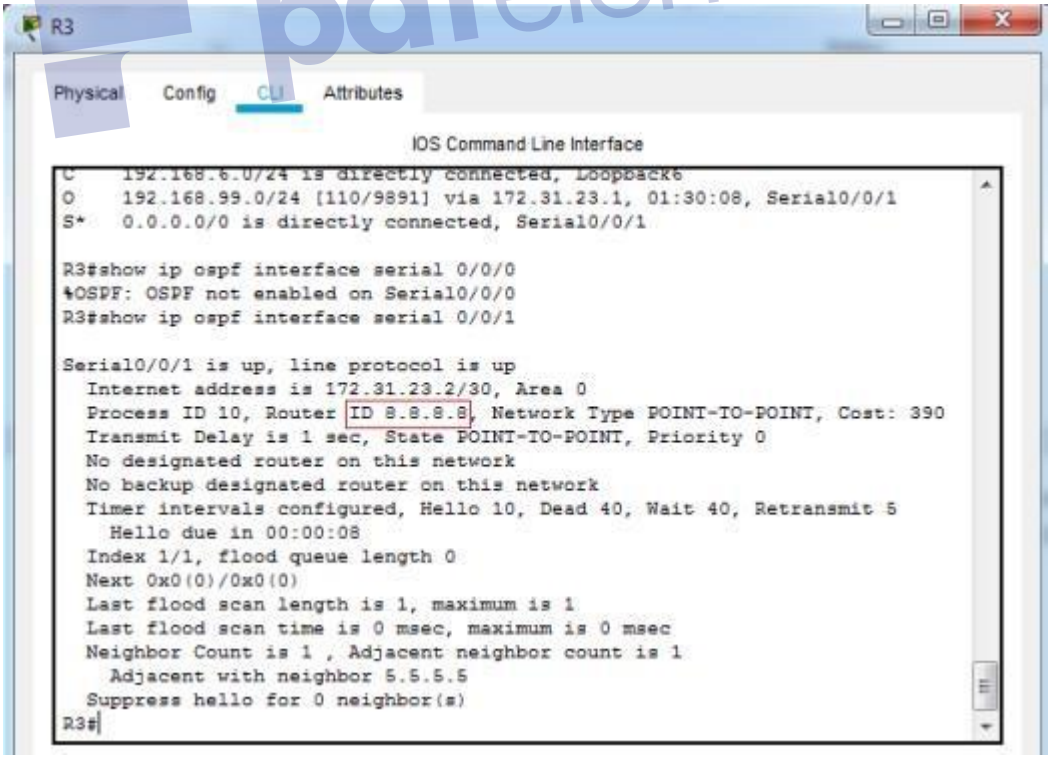

R2
Physical
Config
CLI
Attributes
IOS Command Line Interface
R2#show ip ospf interface s0/0/0
Serial0/0/0 is up, line protocol is up
Internet address is 172.31.23.1/30, Area 0
Process ID 10, Router ID 5.5.5.5, Network Type POINT-TO-POINT, Cost: 9500
Transmit Delay is 1 sec, State POINT-TO-POINT, Priority 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 00:00:09
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)
R2#show ip ospf neighbor
Neighbor ID Pri State Dead Time Address Interface
8.8.8.8 0 FULL/ - 00:00:34 172.31.23.2 Serial0/0/0
1.1.1.1 0 FULL/ - 00:00:35 172.31.21.1 Serial0/0/1
R2#

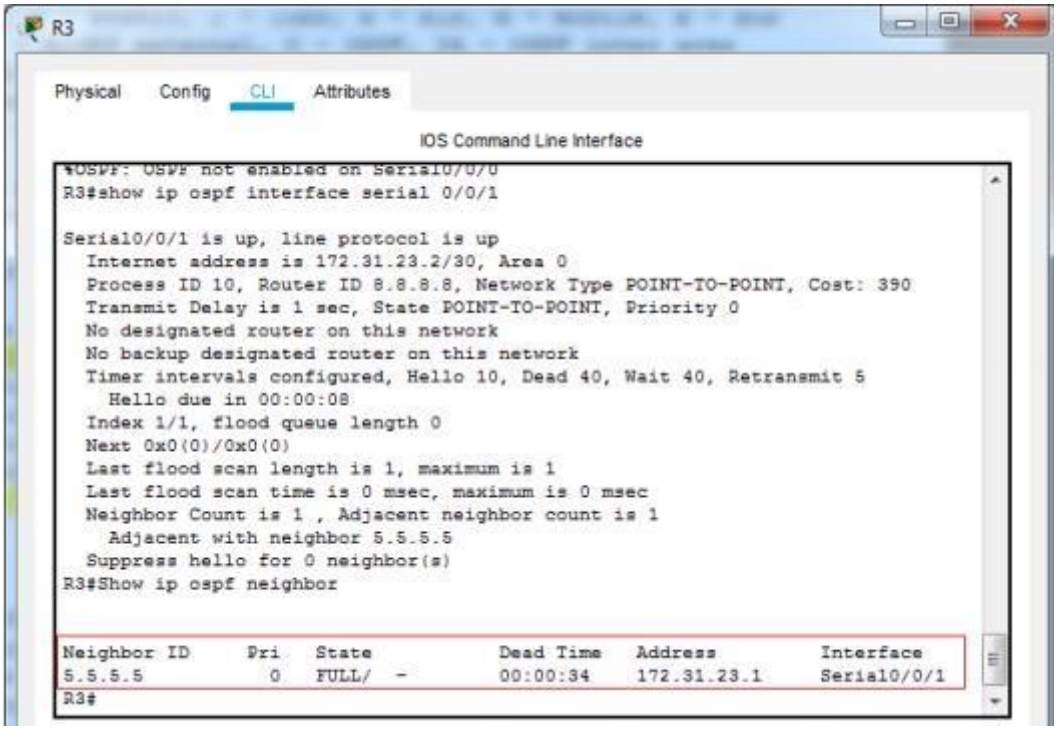


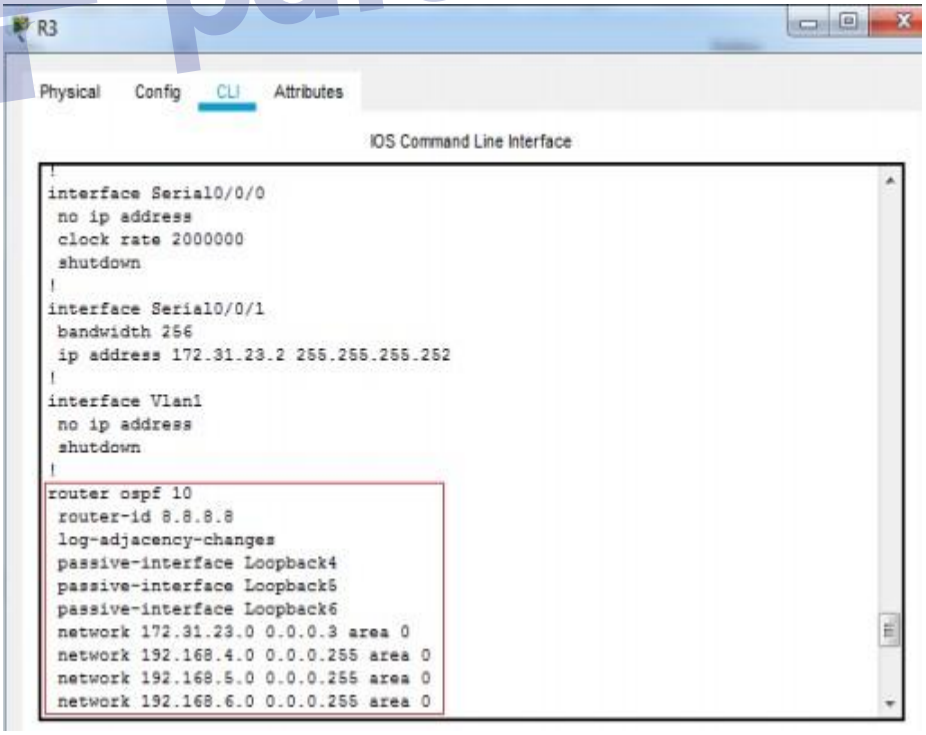
Verificación de R3




R3
Physical
Config
CLI
Attributes
IOS Command Line Interface
R3#show ip route
Codes: C - connected, S - static, I - IGRP, 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 0.0.0.0 to network 0.0.0.0
10.0.0.0/24 is subnetted, 1 subnets
O 10.10.10.0 [110/391] via 172.31.23.1, 01:30:08, Serial0/0/1
172.31.0.0/30 is subnetted, 2 subnets
O 172.31.21.0 [110/9890] via 172.31.23.1, 01:30:08, Serial0/0/1
C 172.31.23.0 is directly connected, Serial0/0/1
C 192.168.4.0/24 is directly connected, Loopback4
C 192.168.5.0/24 is directly connected, Loopback5
C 192.168.6.0/24 is directly connected, Loopback6
O 192.168.99.0/24 [110/9891] via 172.31.23.1, 01:30:08, Serial0/0/1
S* 0.0.0.0/0 is directly connected, Serial0/0/1
R3#


R3
Physical
Config
CLI
Attributes
IOS Command Line Interface
C 192.168.6.0/24 is directly connected, Loopback6
O 192.168.99.0/24 [110/9891] via 172.31.23.1, 01:30:08, Serial0/0/1
S* 0.0.0.0/0 is directly connected, Serial0/0/1
R3#show ip ospf interface serial 0/0/0
%OSPF: OSPF not enabled on Serial0/0/0
R3#show ip ospf interface serial 0/0/1
Serial0/0/1 is up, line protocol is up
Internet address is 172.31.23.2/30, Area 0
Process ID 10, Router ID 8.8.8.8, Network Type POINT-TO-POINT, Cost: 390
Transmit Delay is 1 sec, State POINT-TO-POINT, Priority 0
No designated router on this network
No backup designated router on this network
Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
Hello due in 00:00:08
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 1 , Adjacent neighbor count is 1
Adjacent with neighbor 5.5.5.5
Suppress hello for 0 neighbor(s)
R3#


R3
Physical
Config
CLI
Attributes
IOS Command Line Interface
%OSPF: OSPF not enabled on Serial0/0/0
R3#show ip ospf interface serial 0/0/1
Serial0/0/1 is up, line protocol is up
Internet address is 172.31.23.2/30, Area 0
Process ID 10, Router ID 8.8.8.8, Network Type POINT-TO-POINT, Cost: 390
Transmit Delay is 1 sec, State POINT-TO-POINT, Priority 0
No designated router on this network
No backup designated router on this network
Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
Hello due in 00:00:08
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 1 , Adjacent neighbor count is 1
Adjacent with neighbor 5.5.5.5
Suppress hello for 0 neighbor(s)
R3#Show ip ospf neighbor
Neighbor ID Pri State Dead Time Address Interface
5.5.5.5 0 FULL/ - 00:00:34 172.31.23.1 Serial0/0/1
R3#


R3
Physical
Config
CLI
Attributes
IOS Command Line Interface
!
interface Serial0/0/0
no ip address
clock rate 2000000
shutdown
!
interface Serial0/0/1
bandwidth 256
ip address 172.31.23.2 255.255.255.252
!
interface Vlan1
no ip address
shutdown
!
router ospf 10
router-id 8.8.8.8
log-adjacency-changes
passive-interface Loopback4
passive-interface Loopback5
passive-interface Loopback6
network 172.31.23.0 0.0.0.3 area 0
network 192.168.4.0 0.0.0.255 area 0
network 192.168.5.0 0.0.0.255 area 0
network 192.168.6.0 0.0.0.255 area 0

10. (Caicedo, 2001)Configurar VLANs, Puertos troncales, puertos de acceso, encapsulamiento, Inter-VLAN Routing y Seguridad en los Switches acorde a la topología de red establecida.

Configuración de S1

```
Switch>en
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname S1
S1(config)#vlan 30
S1(config-vlan)#name Administracion
S1(config-vlan)#vlan 40
S1(config-vlan)#name Mercadeo
S1(config-vlan)#vlan 200
S1(config-vlan)#name Mantenimiento
S1(config-vlan)#exit
S1(config)#interface vlan 200
S1(config-if)#ip address 192.168.99.2 255.255.255.0
S1(config-if)#no shutdown
S1(config-if)#ip default-gateway 192.168.99.1
S1(config)#interface f0/1
S1(config-if)#switchport mode access
S1(config-if)#switchport access vlan 30
S1(config-if)#interface f0/3
S1(config-if)#switchport mode trunk
S1(config-if)#switchport trunk native vlan 200
S1(config-if)#switchport trunk allowed vlan 30,40,200
S1(config-if)#interface f0/24
S1(config-if)#switchport mode trunk
S1(config-if)#switchport trunk native vlan 200
S1(config-if)#switchport trunk allowed vlan 30,40,200
S1(config-if)#interface range f0/2, f0/
S1(config-if)#interface range f0/2, f0/4-f0/23
S1(config-if-range)#shutdown
```


Configuración de S3

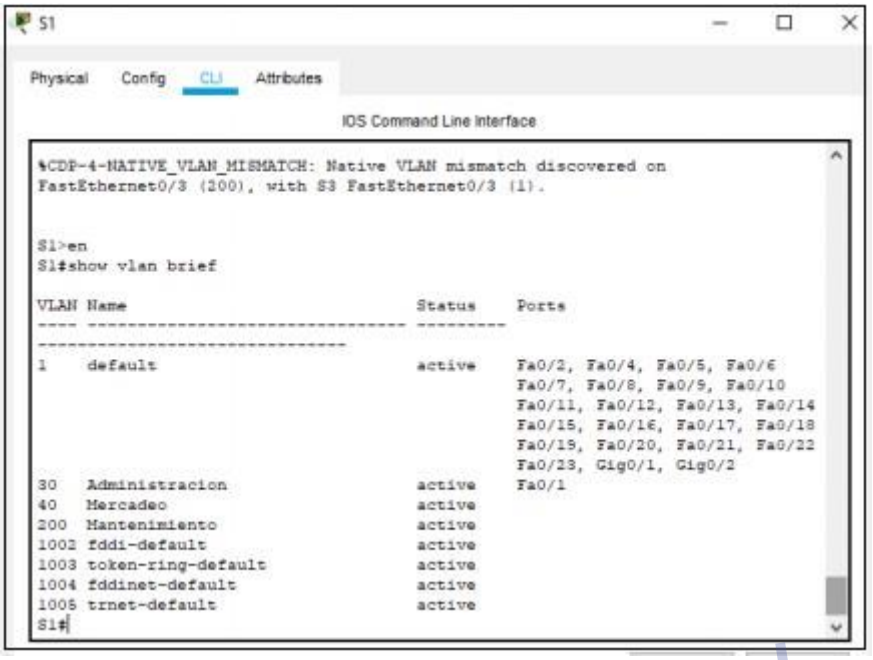
```
Switch>en
Switch#conf t
Switch(config)#hostname S3
S3(config)#vlan 30
S3(config-vlan)#name Administracion
S3(config-vlan)#vlan 40
S3(config-vlan)#name Mercadeo
S3(config-vlan)#vlan 200
S3(config-vlan)#name Mantenimiento
S3(config-vlan)#exit
S3(config)#interface vlan 200
S3(config-if)#ip address 192.168.99.3 255.255.255.0
S3(config-if)#no shutdown
S3(config-if)#ip default-gateway 192.168.99.1
S3(config)#interface f0/1
S3(config-if)#switchport mode access
S3(config-if)#switchport access vlan 40
S3(config-if)#interface f0/3
S3(config-if)#switchport mode trunk
S3(config-if)#switchport trunk native vlan 200
S3(config-if)#switchport trunk allowed vlan 30,40,200
S3(config-if)#interface range f0/2, f0/4-f0/24
S3(config-if-range)#shutdown
```

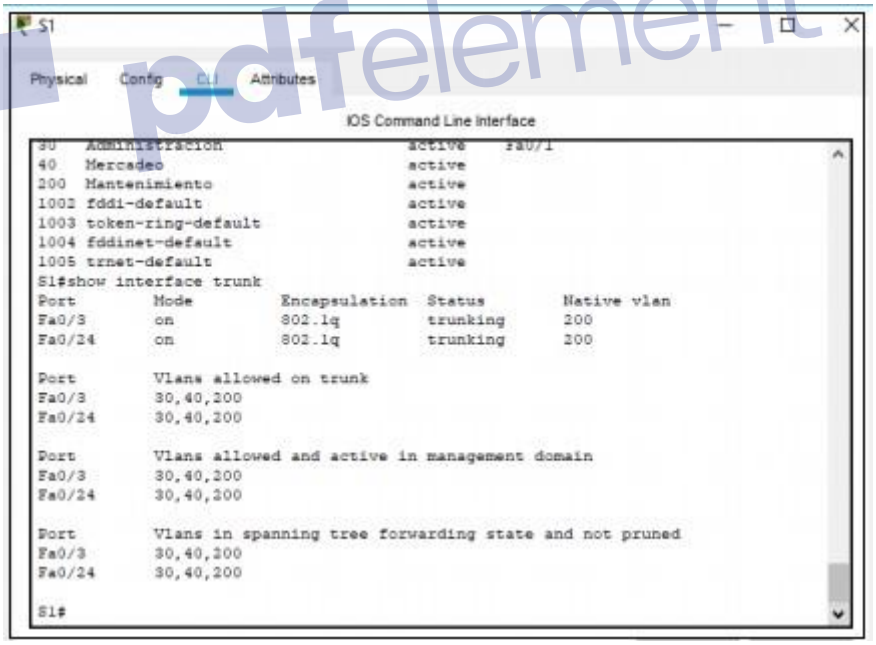
Configuración de R1

```
R1>en
R1#conf t
R1(config)#interface f0/0.30
R1(config-subif)#encapsulation dot1q 30
R1(config-subif)#ip address 192.168.30.1 255.255.255.0
R1(config-subif)#interface f0/0.40
R1(config-subif)#encapsulation dot1q 40
R1(config-subif)#ip address 192.168.40.1 255.255.255.0
R1(config-subif)#interface f0/0.200
R1(config-subif)#encapsulation dot1q 200 native
R1(config-subif)#ip address 192.168.200.1 255.255.255.0
R1(config-subif)#interface f0/0
R1(config-if)#no shutdown
```

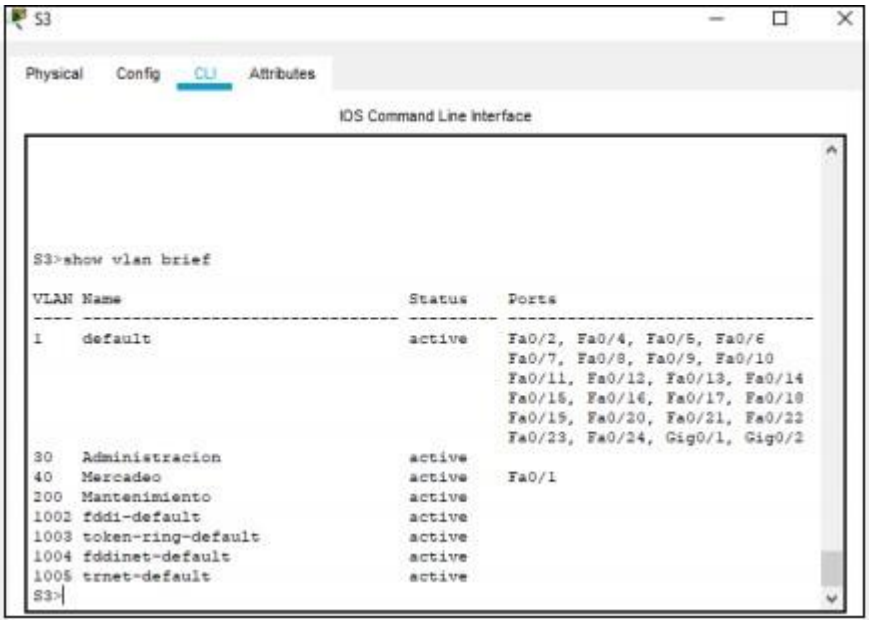
11. (Caicedo, 2001)En el Switch 3 deshabilitar DNS lookup

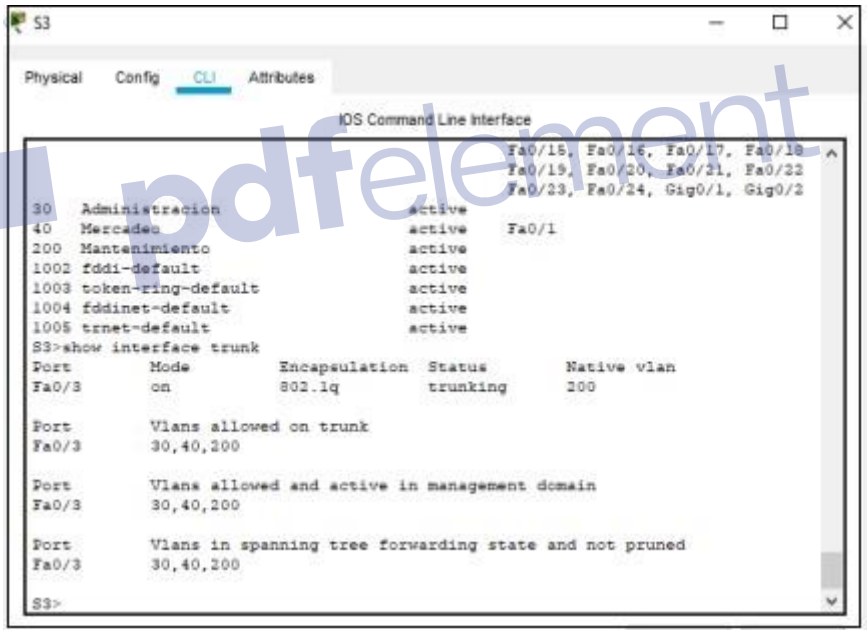
de S1



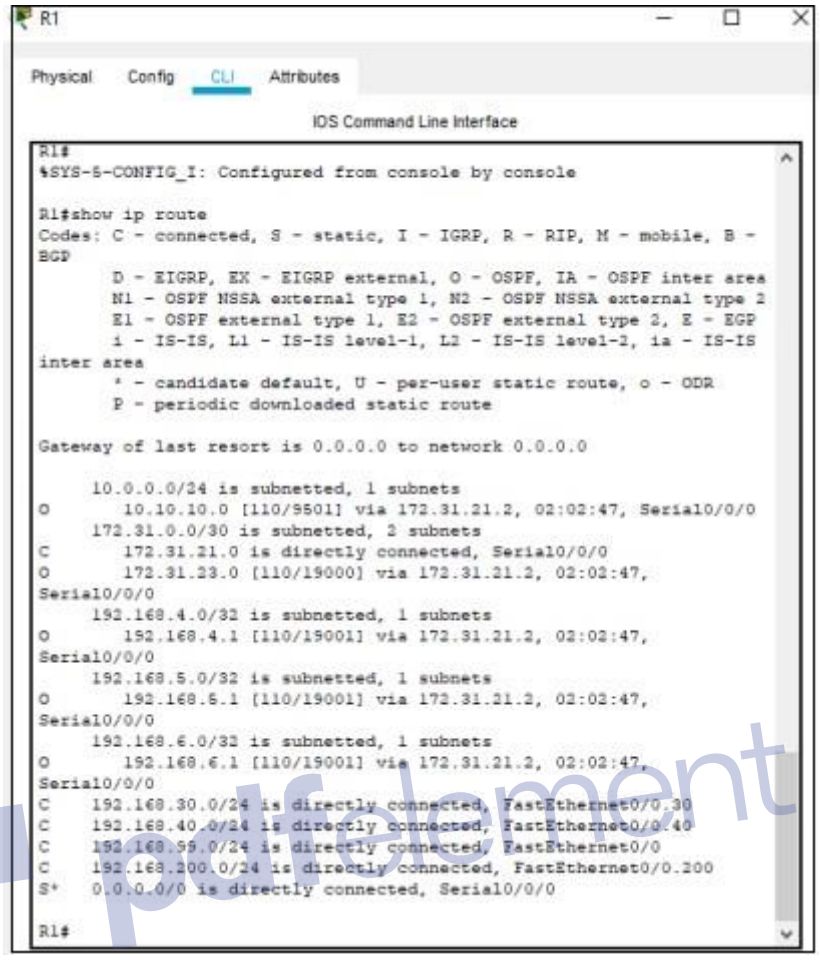


Verificación de S3





Verificación de R1

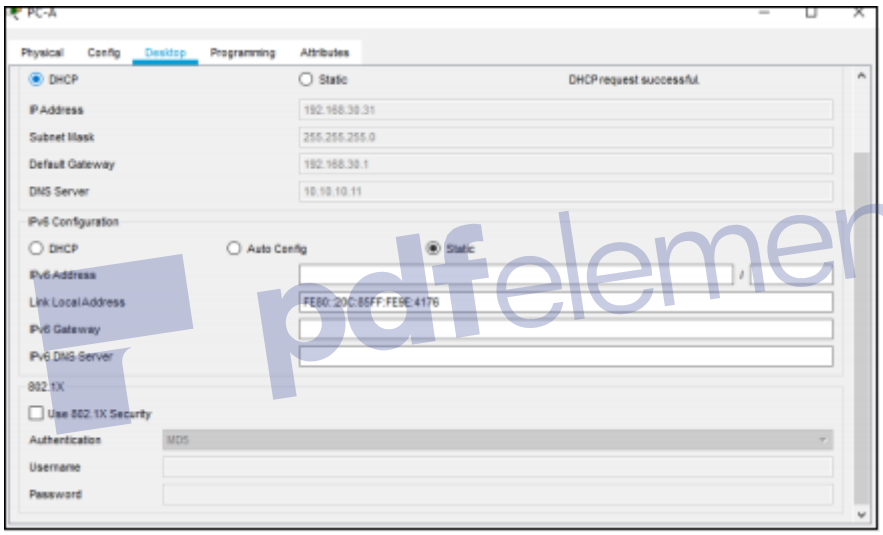


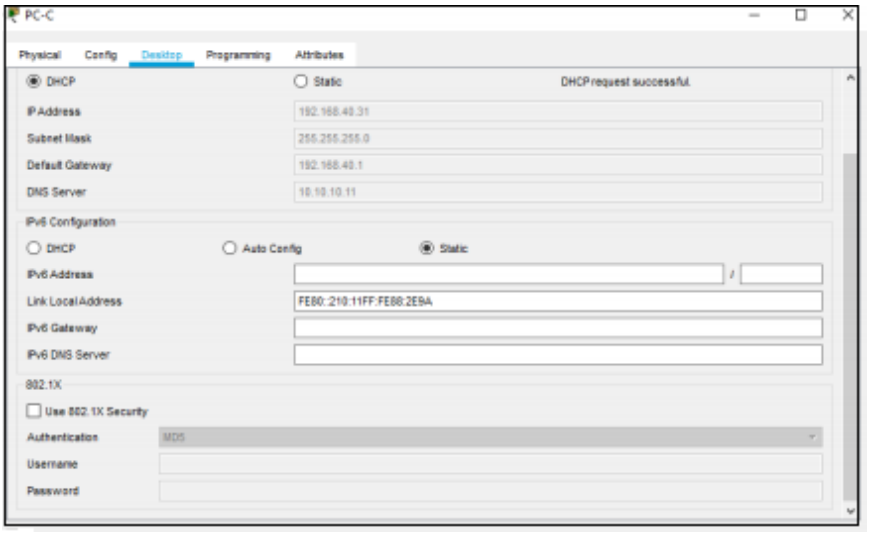
12. (Caicedo, 2001)Implement DHCP and NAT for IPv4

Configuración de DHCP para IPv4

Configuración de R1

```
R1>en
R1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
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)#network 192.168.30.0 255.255.255.0
R1(dhcp-config)#default-router 192.168.30.1
R1(dhcp-config)#dns-server 10.10.10.11
R1(dhcp-config)#ip dhcp pool MERCADEO
R1(dhcp-config)#network 192.168.40.0 255.255.255.0
R1(dhcp-config)#default-router 192.168.40.1
R1(dhcp-config)#dns-server 10.10.10.11
```





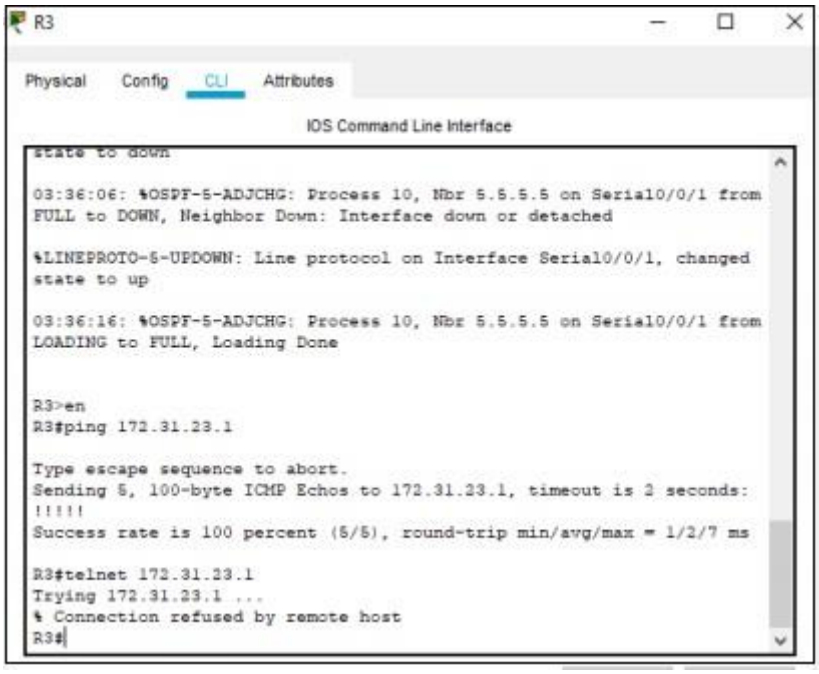
13. (Caicedo, 2001)Configurar NAT en R2 para permitir que los host puedan salir a internet.

- Configuración de NAT

  Configuración de NAT en R2

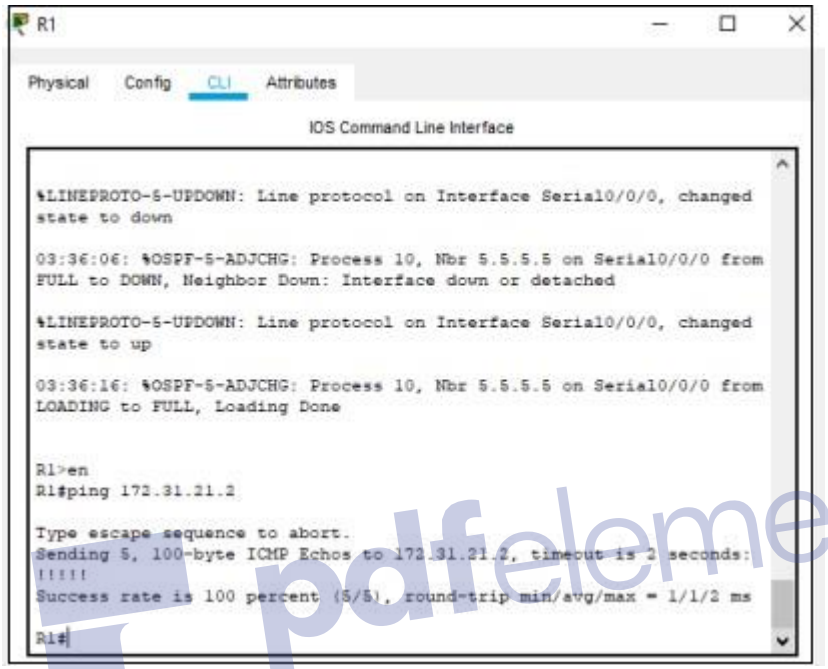
```
R2>en
R2#conf t
R2(config)#ip nat inside source static 10.10.10.10 209.165.200.229
R2(config)#interface f0/1
R2(config-if)#ip nat inside
R2(config-if)#interface f0/0
R2(config-if)#ip nat outside
```

14. 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.

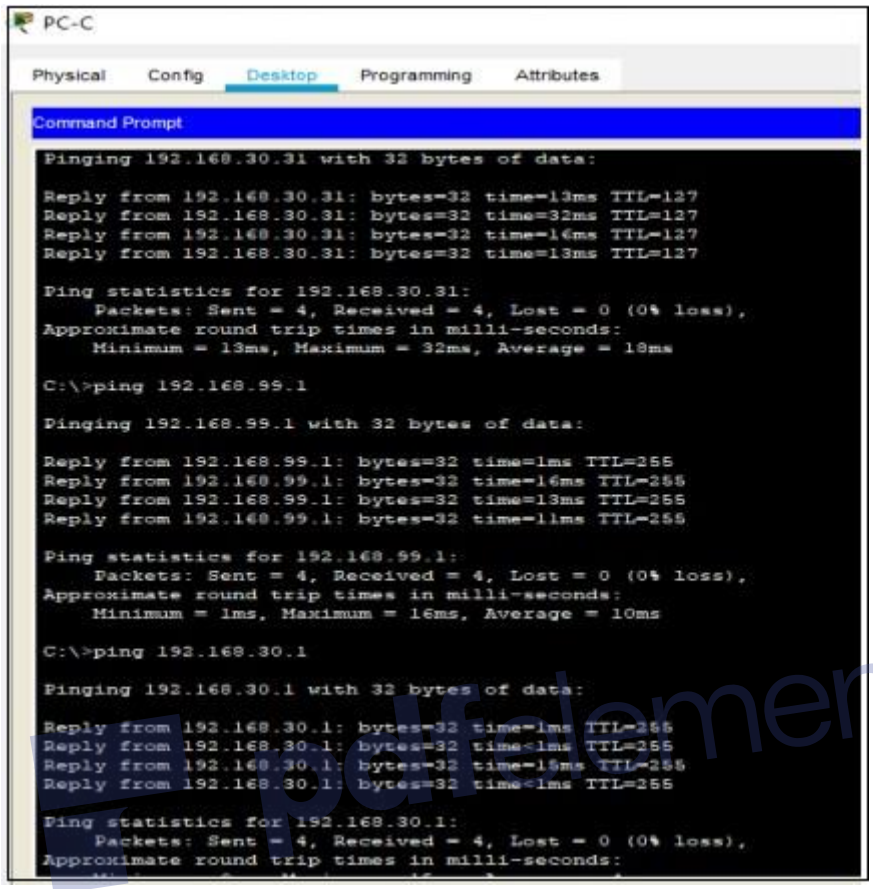


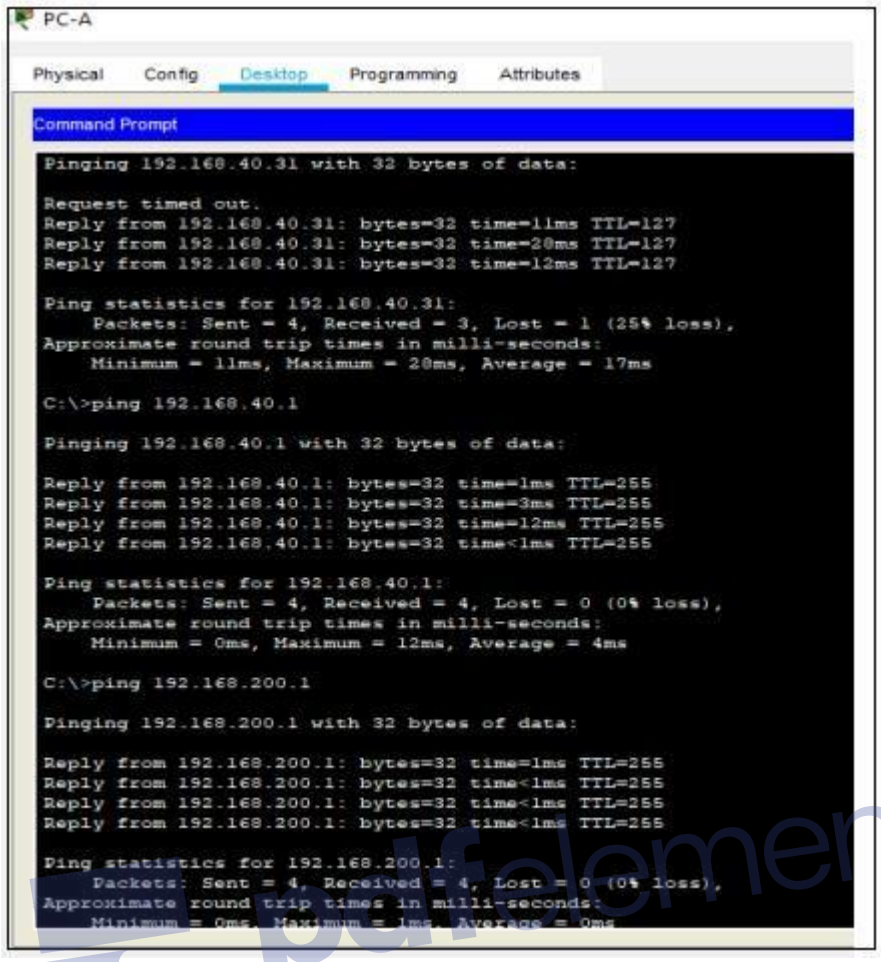
15. Configurar al menos dos listas de acceso de tipo extendido o nombradas a su criterio en para restringir o permitir tráfico desde R1 o R3 hacia R2.

(Caicedo, 2001)



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




PC-A
Physical
Config
Desktop
Programming
Attributes
Command Prompt
Pinging 192.168.40.31 with 32 bytes of data:
Request timed out.
Reply from 192.168.40.31: bytes=32 time=11ms TTL=127
Reply from 192.168.40.31: bytes=32 time=20ms TTL=127
Reply from 192.168.40.31: bytes=32 time=12ms 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 = 11ms, Maximum = 20ms, Average = 17ms
C:\>ping 192.168.40.1
Pinging 192.168.40.1 with 32 bytes of data:
Reply from 192.168.40.1: bytes=32 time=1ms TTL=255
Reply from 192.168.40.1: bytes=32 time=3ms TTL=255
Reply from 192.168.40.1: bytes=32 time=12ms TTL=255
Reply from 192.168.40.1: bytes=32 time<1ms TTL=255
Ping statistics for 192.168.40.1:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 12ms, Average = 4ms
C:\>ping 192.168.200.1
Pinging 192.168.200.1 with 32 bytes of data:
Reply from 192.168.200.1: bytes=32 time=1ms TTL=255
Reply from 192.168.200.1: bytes=32 time<1ms TTL=255
Reply from 192.168.200.1: bytes=32 time<1ms TTL=255
Reply from 192.168.200.1: bytes=32 time<1ms TTL=255
Ping statistics for 192.168.200.1:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 1ms, Average = 0ms

CONCLUSIONES

(Caicedo, 2001; Caicedo, 2001)Con este trabajo de prueba de habilidades prácticas, que me permitió poner en práctica, mis conocimientos adquiridos a lo largo del curso en temas como Routing and Switching, configurando redes óptimas, el uso que se le dio a las Redes VLAN dentro de este trabajo fue para que se pudiera segmentar aquella redes, que proporcionaran mayor rendimiento, seguridad y buena capacidad de administración.

Por otra parte el OSPF presenta ventajas considerables en comparación con RIP, debido a que nos ofrece una convergencia más rápida y escala a implementaciones de red mucho más grandes. Las listas de control de acceso (ACL) es una forma de darle seguridad a una Red, claro que evitando el uso no autorizado de las mismas, para detener el tráfico o para permitir solamente tráfico especifico en sus redes. Las direcciones IP son la herramienta que permiten identificar los dispositivos que por estos Escenarios1 y Escenario2 se pudo componer una Red, claro que algunos requieren IP fijas para acceder fácil a ellos, como el caso de impresoras, routers, entre otros, para los dispositivos que no requieren una IP fija se maneja DHCP que otorga direcciones IP dinámicas, esto es principalmente para dispositivos que no se conectan todo el tiempo a la Red o que lo hacen desde ubicaciones diferentes.

Bibliografía

Caicedo, J. I. (2001). *DIPLOMADO DE PROFUNDIZACION CISCO UNA POWER POINT.*

https://www.youtube.com/watch?v=3DJ5umqAxFM

(Caicedo, 2001)

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https://alexalvarez0310.wordpress.com/category/comandos-basicos-de-un-router-cisco/