PRUEBA DE HABILIDADES PRACTICAS CCNA

EVALUACIÓN

DOMINGO DE JESUS FLOREZ VARILLA

UNIVERSIDAD NACIONAL ABIERTA Y A DISTANCIA

ESCUELA DE CIENCIAS BÁSICAS Y TECNOLOGÍA

MAYO 2019

DIPLOMADO DE PROFUNDIZACIÓN CISCO DISEÑO E IMPLEMENTACIÓN DE SOLUCIONES INTEGRADAS LAN / WAN7 OPCI.

EVALUACIÓN – PRUEBA DE HABILIDADES PRÁCTICAS CCNA

PRESENTADO POR:

DOMINGO DE JESUS FLOREZ VARILLA

TUTOR

DIEGO EDINSON RAMIREZ CLAROS

UNIVERSIDAD NACIONAL ABIERTA Y A DISTANCIA

ESCUELA DE CIENCIAS BASICAS, TECNOLOGIA E INGENIERIA

PROGRAMA INGENIERIA DE SISTEMAS

SAHAGUN - CORDOBA

MAYO 2019

TABLA DE CONTENIDO

1. INTRODUCCION

La necesidad creciente que las Instituciones de Educación del mundo están enfrentando corresponde a la gran importancia de formar alumnos preparados para un ambiente de trabajo globalizado y para una sociedad digital. Lo que esta generado nuevas formas de aprender, enseñar y nuevos ambientes de aprendizaje.

En este escenario, las instituciones de enseñanza y los educadores cuenta cada vez más con las tecnologías digitales para que sus alumnos desarrollen las competencias, habilidades y actitudes que les permitirán beneficiarse de esa abundancia de informaciones, y estar preparados para ser los mejores profesionales.

Tomado de: https://gblogs.cisco.com/cansac/cisco-para-la-educacion-vision-general-de-las-soluciones/

El siguiente trabajo final de pruebas de habilidades CCNA del diplomado CISCO es el consolidado de los conocimientos obtenidos durante el curso, de los laboratorios realizados y de la interacción con los compañeros de grupo.

Mediante el software Cisco Packet Tracer realizamos las diferentes topologías solicitadas por las guías y aplicamos las diferentes configuraciones para el correcto funcionamiento de las simulaciones.

2. JUSTIFICACION

El presente trabajo de pruebas de habilidades prácticas CCNA se enfocará en dar solución a una problemática de configuración de redes en una empresa tecnológica con sede en diferentes países. Cada uno de los dispositivos deberá ser configurado y deben estar interconectados entre sí. Así, el presente trabajo medirá las habilidades y conocimientos que se desarrollaron en el trascurso del diplomado de profundización CISCO (Diseño e Implementación de Soluciones Integradas LAN / WAN).

3. ESCENARIO 1

DESCRIPCIÓN DE ESCENARIOS PROPUESTOS PARA LA PRUEBA DE HABILIDADES

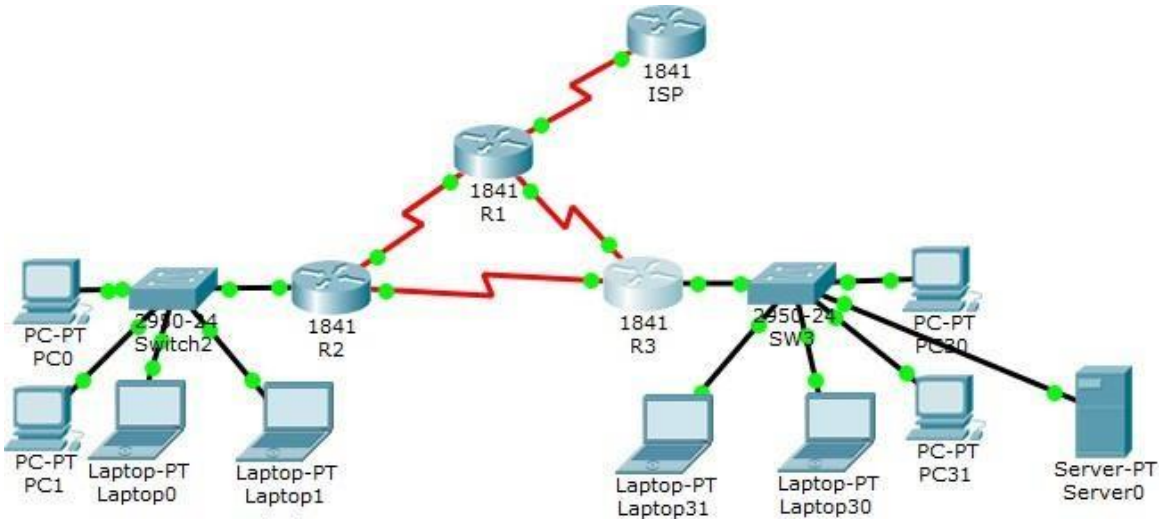


Tabla de direccionamiento

El administrador	Interfaces	Dirección IP	Máscara de subred	Gateway predeterminado
ISP	S0/0/0	200.123.211.1	255.255.255.0	N/D
R1	Se0/0/0	200.123.211.2	255.255.255.0	N/D
	Se0/1/0	10.0.0.1	255.255.255.252	N/D
	Se0/1/1	10.0.0.5	255.255.255.252	N/D
R2	Fa0/0,100	192.168.20.1	255.255.255.0	N/D
	Fa0/0,200	192.168.21.1	255.255.255.0	N/D
	Se0/0/0	10.0.0.2	255.255.255.252	N/D
	Se0/0/1	10.0.0.9	255.255.255.252	N/D
R3	Fa0/0	192.168.30.1	255.255.255.0	N/D
		2001:db8:130::9C0:80F:301	/64	N/D
	Se0/0/0	10.0.0.6	255.255.255.252	N/D
	Se0/0/1	10.0.0.10	255.255.255.252	N/D
SW2	VLAN 100	N/D	N/D	N/D
	VLAN 200	N/D	N/D	N/D
SW3	VLAN1	N/D	N/D	N/D

PC20	NIC	DHCP	DHCP	DHCP
PC21	NIC	DHCP	DHCP	DHCP
PC30	NIC	DHCP	DHCP	DHCP
PC31	NIC	DHCP	DHCP	DHCP
Laptop20	NIC	DHCP	DHCP	DHCP
Laptop21	NIC	DHCP	DHCP	DHCP
Laptop30	NIC	DHCP	DHCP	DHCP
Laptop31	NIC	DHCP	DHCP	DHCP

Tabla de asignación de VLAN y de puertos

Dispositivo	VLAN	Nombre	Interfaz
SW2	100	LAPTOPS	Fa0/2-3
SW2	200	DESTOPS	Fa0/4-5
SW3	1	-	Todas las interfaces

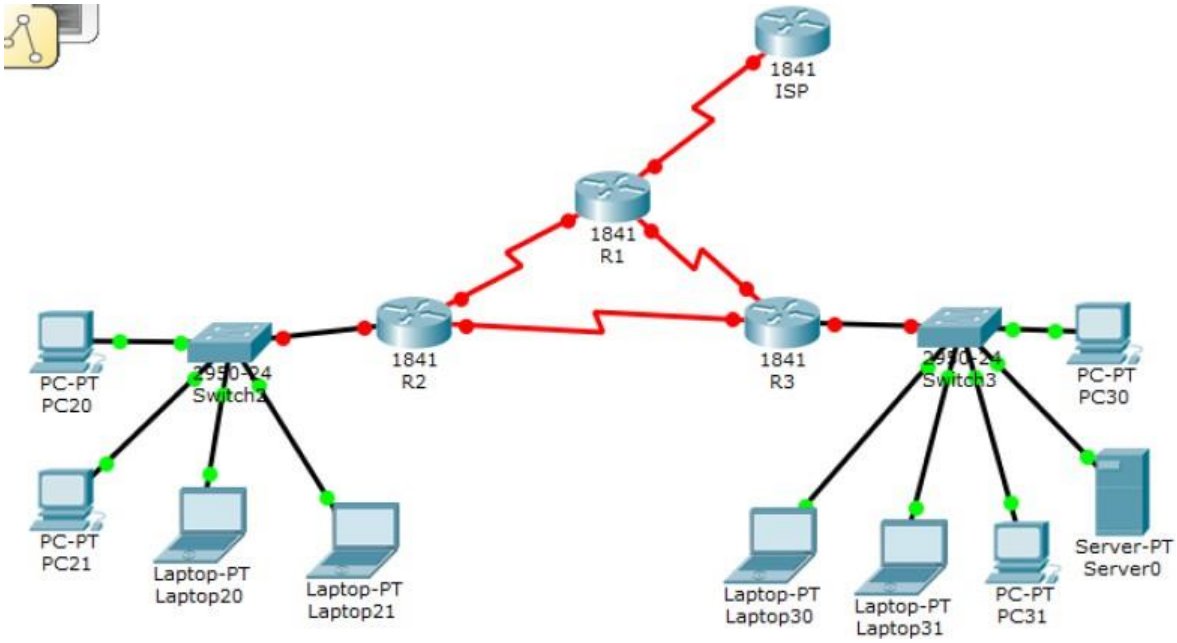
Tabla de enlaces troncales

Dispositivo local	Interfaz local	Dispositivo remoto
SW2	Fa0/2-3	100

Situación

En esta actividad, demostrará y reforzará su capacidad para implementar NAT, servidor de DHCP, RIPV2 y el routing entre VLAN, incluida la configuración de direcciones IP, las VLAN, los enlaces troncales y las subinterfaces. Todas las pruebas de alcance deben realizarse a través de ping únicamente.

Descripción de las actividades - Creación de la red (topología)



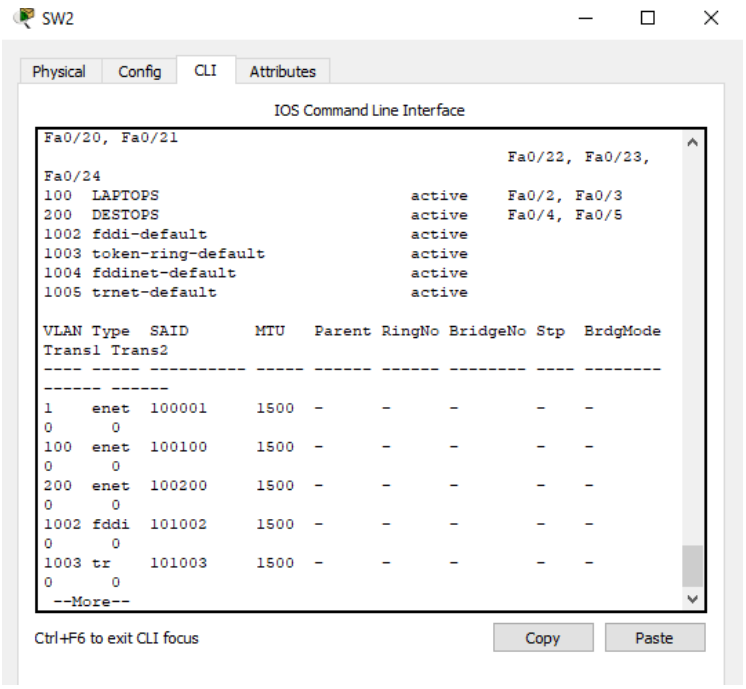
3.1 SW1 VLAN y las asignaciones de puertos de VLAN deben cumplir con la tabla 1.

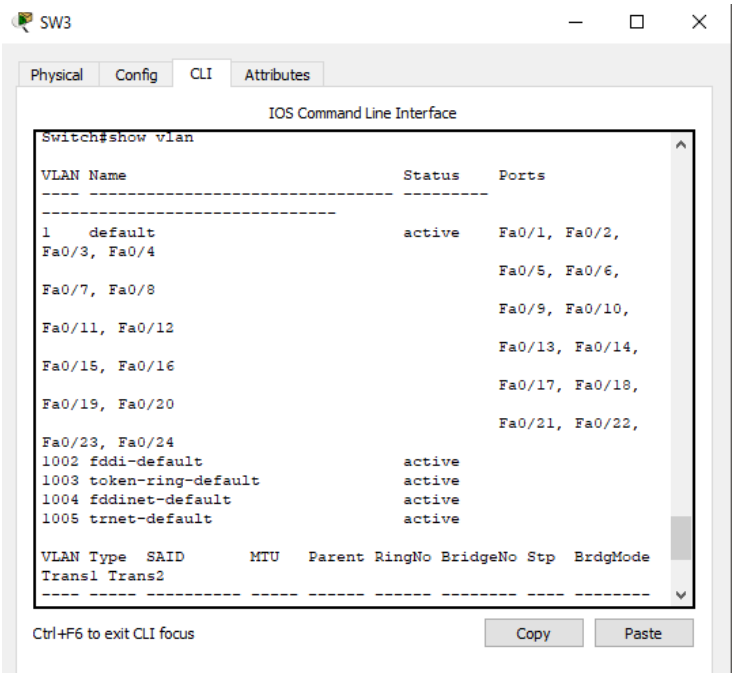
```
S2>enable
S2#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
S2(config)#vlan 100
S2(config-vlan)#name LAPTOPS
S2(config-vlan)#exit
S2(config)#vlan 200
S2(config-vlan)#name DESKTOPS
S2(config-vlan)#exit
S2(config)#interface range fa0/2 - 3
S2(config-if-range)# switchport mode trunk
S2(config-if-range)#switchport trunk native vlan 100
S2(config-if-range)#no shutdown
S2(config-if-range)#exit
S2(config)#interface range fa0/4 – 5
S2(config-if-range)#port access vlan 200
S2(config-if-range)#no shutdown
S2(config-if-range)#exit
```

3.1.1 Habilitar el Puerto fa0/1 como troncal para la transmisión de datos en las VLANS

S2(config)#interface fa0/1

S2(config-if)#switchport mode trunk





3.2 Los puertos de red que no se utilizan se deben deshabilitar.

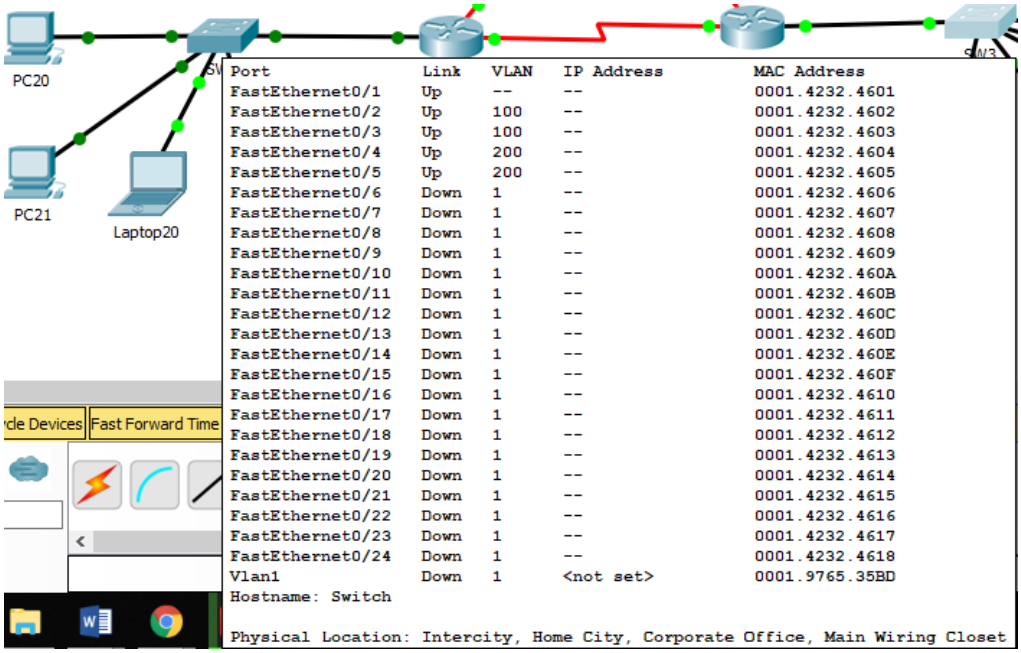
S2>enable

S2#configure terminal

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

S2(config)#interface range fa0/6 - 22, g0/1 - 2

S2(config-if-range)#shutdown



3.3 La información de dirección IP R1, R2 y R3 debe cumplir con la tabla 1.

3.3.1 Configuración IP en ISP

```
ISP>enable
ISP#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
ISP(config)#interface lo0
ISP(config-if)#
%LINK-5-CHANGED: Interface Loopback0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback0,
changed state to up
ISP(config-if)#ip address 192.31.7.1 255.255.255.0
ISP(config-if)#no shutdown
ISP(config-if)#end
```

3.3.2 Configuración IP en R1

```
R1>enable
R1#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#interface s0/0/0
R1(config-if)#ip address 200.123.211.2 255.255.255.0
R1(config-if)#no shutdown
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to down
R1(config-if)#
R1(config-if)#exit
R1(config)#interface s0/1/0
R1(config-if)#ip address 10.0.0.1 255.255.255.252
R1(config-if)#no shutdown
```

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

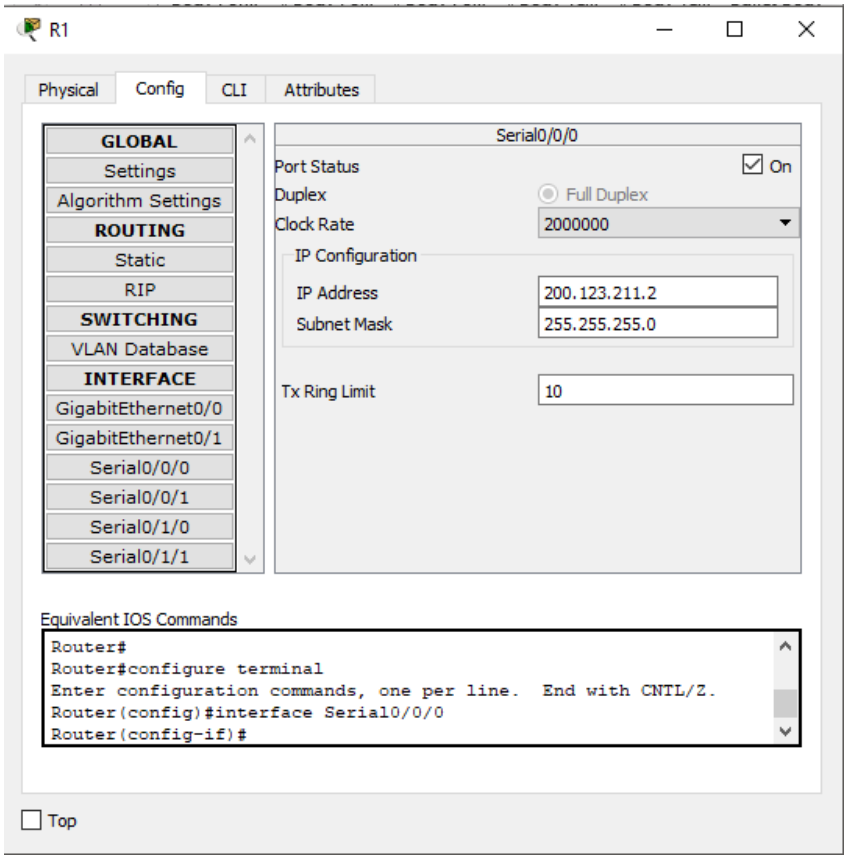
R1(config-if)#exit

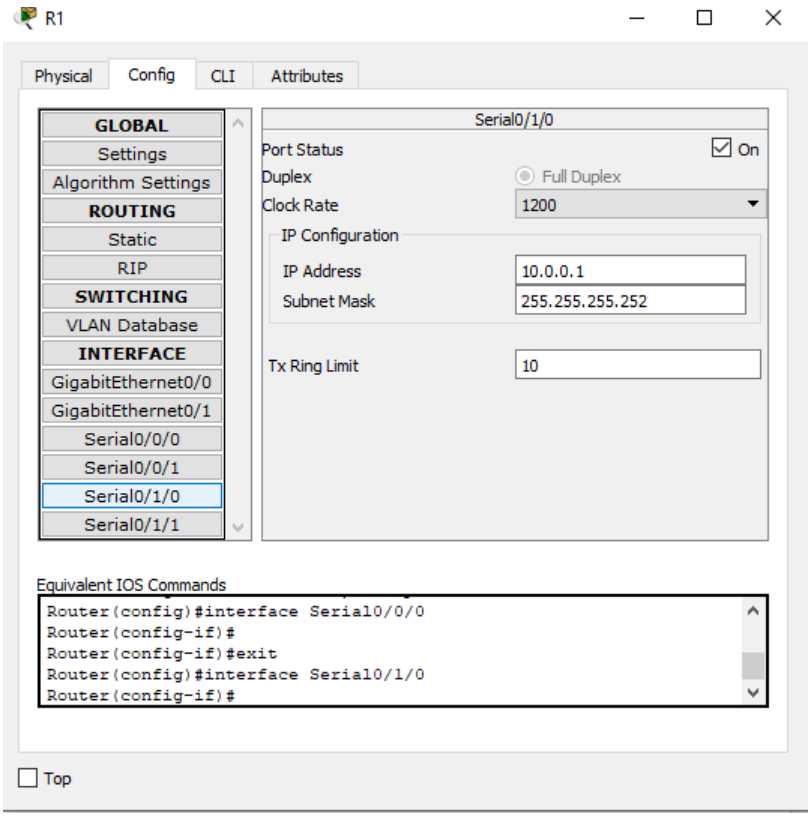
R1(config)#inetrface s0/1/1

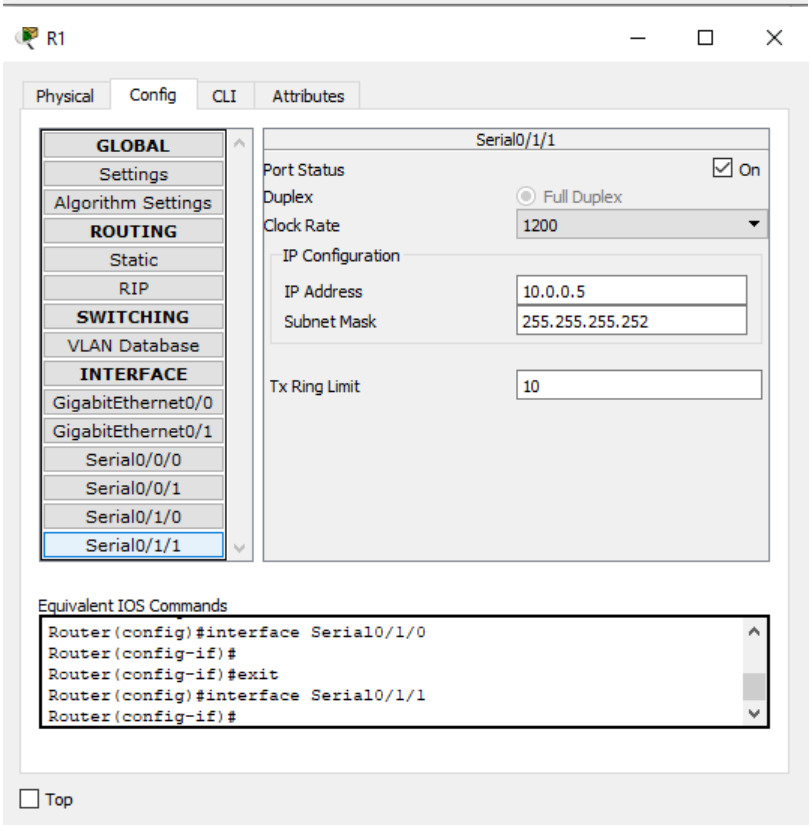
R1(config)#interface s0/1/1

R1(config-if)#ip address 10.0.0.5 255.255.255.252

R1(config-if)#no shutdown




R1
Physical
Config
CLI
Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
GigabitEthernet0/0
GigabitEthernet0/1
Serial0/0/0
Serial0/0/1
Serial0/1/0
Serial0/1/1
Serial0/1/0
Port Status
On
Duplex
Full Duplex
Clock Rate
1200
IP Configuration
IP Address
10.0.0.1
Subnet Mask
255.255.255.252
Tx Ring Limit
10
Equivalent IOS Commands
Router(config)#interface Serial0/0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial0/1/0
Router(config-if)#
Top


R1
Physical
Config
CLI
Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
GigabitEthernet0/0
GigabitEthernet0/1
Serial0/0/0
Serial0/0/1
Serial0/1/0
Serial0/1/1
Serial0/1/1
Port Status
On
Duplex
Full Duplex
Clock Rate
1200
IP Configuration
IP Address
10.0.0.5
Subnet Mask
255.255.255.252
Tx Ring Limit
10
Equivalent IOS Commands
Router(config)#interface Serial0/1/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial0/1/1
Router(config-if)#
Top

3.3.3 Configuración IP en R2

R1>enable

R1#configure terminal

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

R2(config)#interface s0/0/0

R2(config-if)#ip address 10.0.0.2 255.255.255.252

R2(config-if)#no shutdown

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

R2(config-if)#exit

R2(config)#interface s0/0/

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

R2(config)#interface s0/0/1

R2(config-if)#ip address 10.0.0.9 255.255.255.252

R2(config-if)#no shutdown

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

R2(config)#interface fa0/0.100

R2(config-subif)#encapsulation dot1Q 100

R2(config-subif)#ip address 192.168.20.1 255.255.255.0

R2(config-subif)#interface fa0/0.200

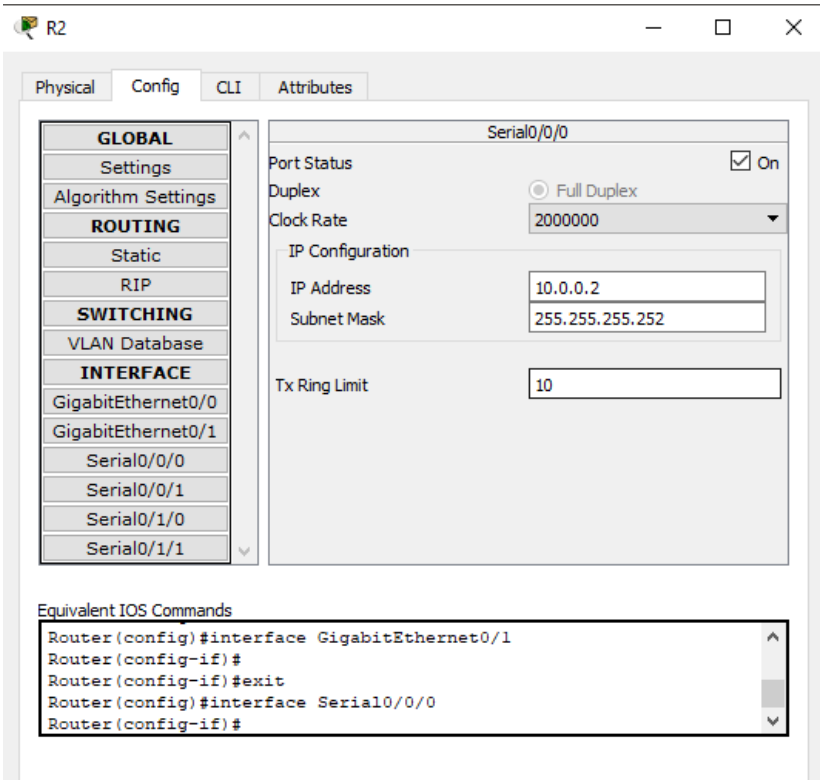
R2(config-subif)#encapsulation dot1Q 200

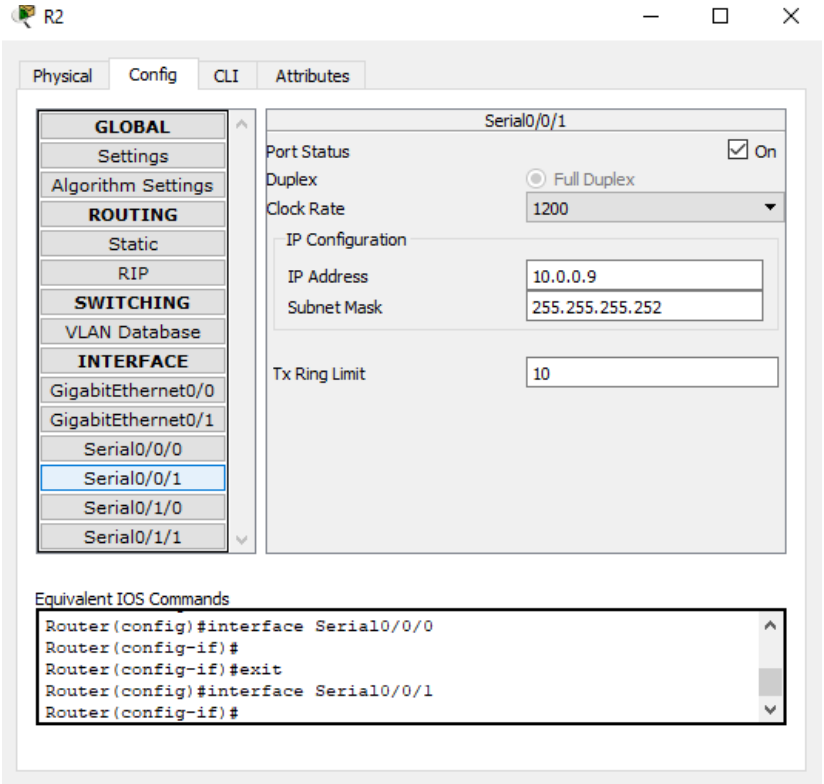
R2(config-subif)#ip address 192.168.21.1 255.255.255.0

R2(config-subif)#exit

R2(config)#interface fa0/0

R2(config-if)#no shutdown


R2
Physical
Config
CLI
Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
GigabitEthernet0/0
GigabitEthernet0/1
Serial0/0/0
Serial0/0/1
Serial0/1/0
Serial0/1/1
Serial0/0/0
Port Status
On
Duplex
Full Duplex
Clock Rate
2000000
IP Configuration
IP Address
10.0.0.2
Subnet Mask
255.255.255.252
Tx Ring Limit
10
Equivalent IOS Commands
Router(config)#interface GigabitEthernet0/1
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial0/0/0
Router(config-if)#


R2
Physical
Config
CLI
Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
GigabitEthernet0/0
GigabitEthernet0/1
Serial0/0/0
Serial0/0/1
Serial0/1/0
Serial0/1/1
Serial0/0/1
Port Status
On
Duplex
Full Duplex
Clock Rate
1200
IP Configuration
IP Address
10.0.0.9
Subnet Mask
255.255.255.252
Tx Ring Limit
10
Equivalent IOS Commands
Router(config)#interface Serial0/0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial0/0/1
Router(config-if)#

3.3.4 Configuración IP en R3

R3>enable

R3#configure terminal

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

R3(config)#unicast routing-ipv6

R3(config)#ipv6 unicast-routing

R3(config)#end

R3#

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

R3# configure terminal

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

R3(config)#interface fa0/0

R3(config-if)#ip address 192.168.30.1 255.255.255.0

R3(config-if)#ipv6 address 2001:db8:130::9C0:80F:301/64

R3(config-if)#no shutdown

R3(config)#interface s0/0/0

R3(config-if)#ip address 10.0.0.6 255.255.255.252

R3(config-if)#no shutdown

R3(config-if)#

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

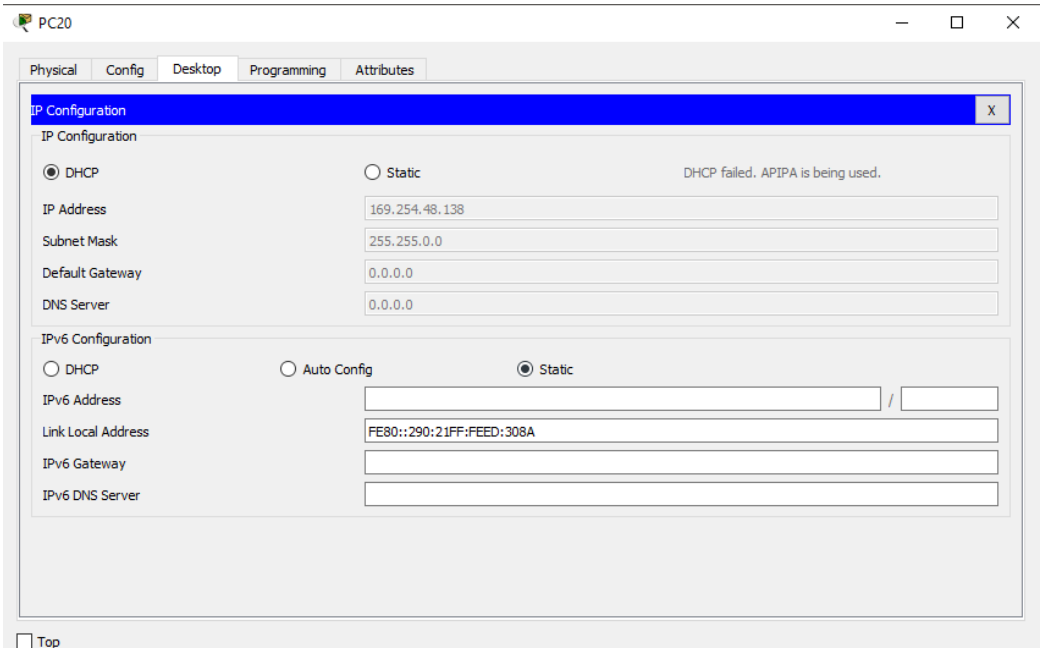
R3(config-if)#interface s0/0/1

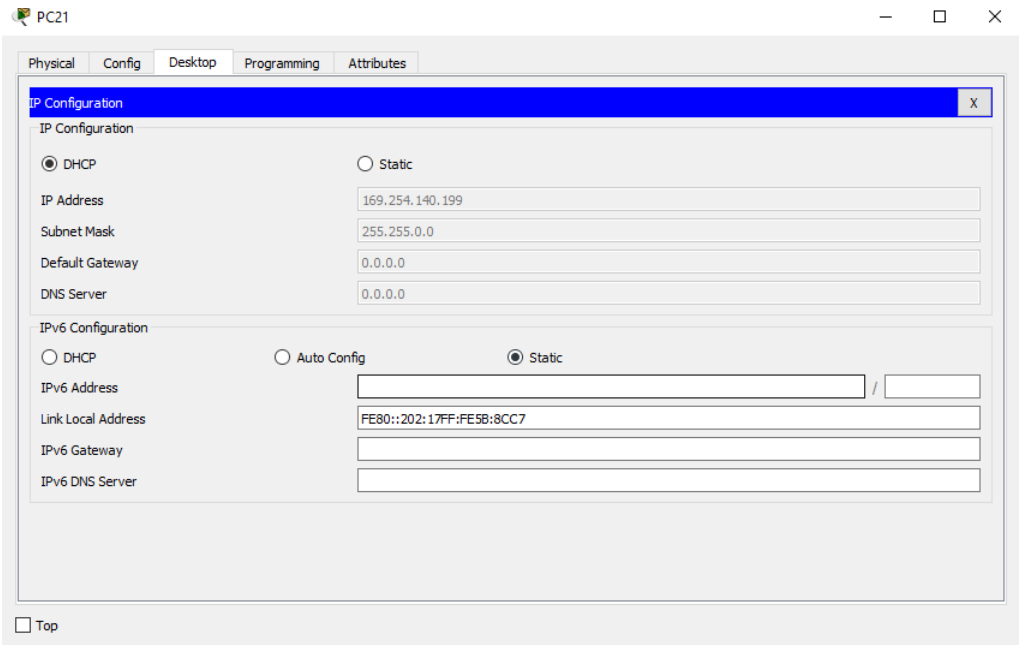
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changedstate to up

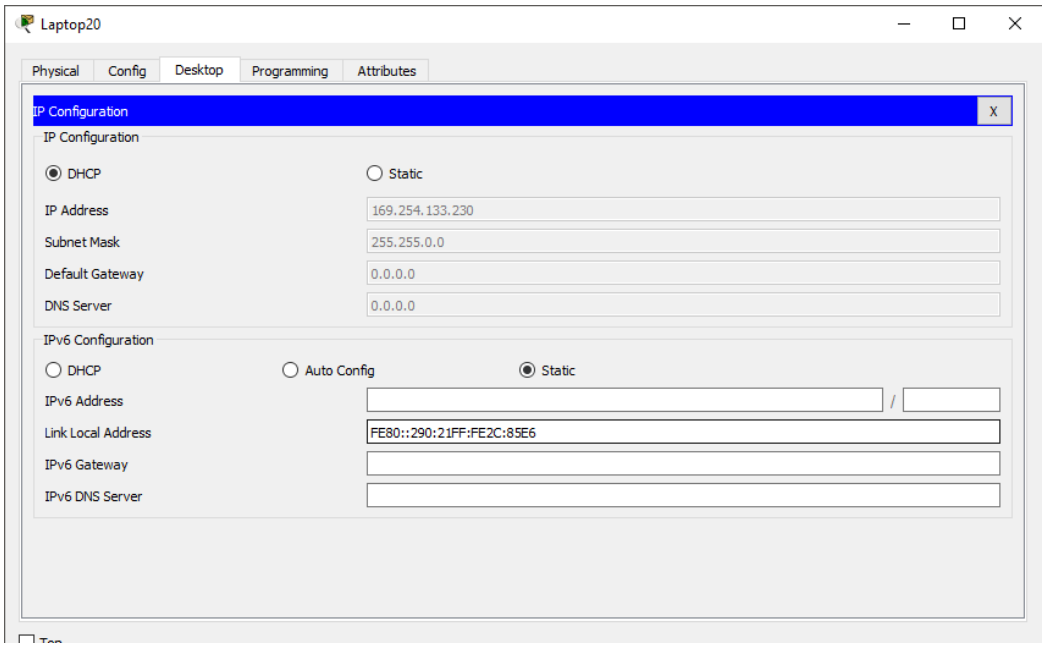
R3(config-if)#ip address 10.0.0.10 255.255.255.252

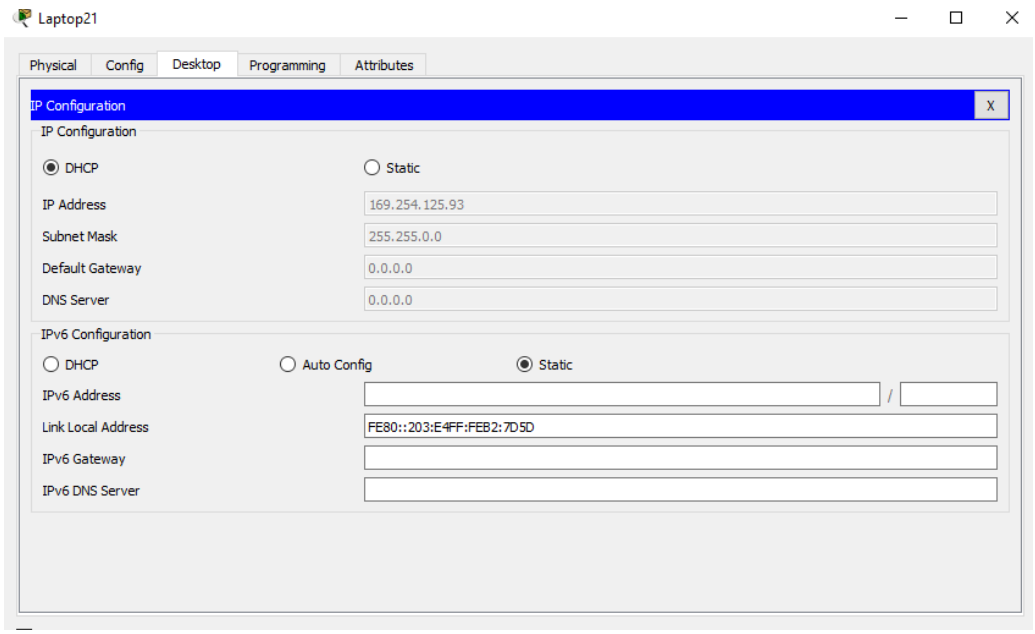
R3(config-if)#no shutdown

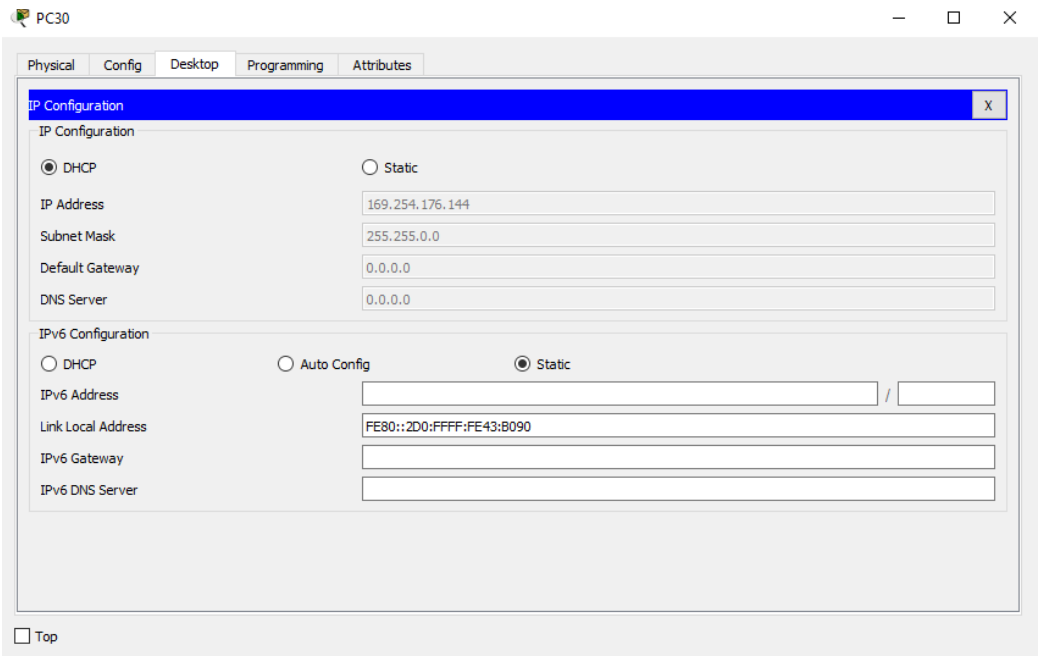
3.4 Laptop20, Laptop21, PC20, PC21, Laptop30, Laptop31, PC30 y PC31 deben obtener información IPv4 del servidor DHCP.

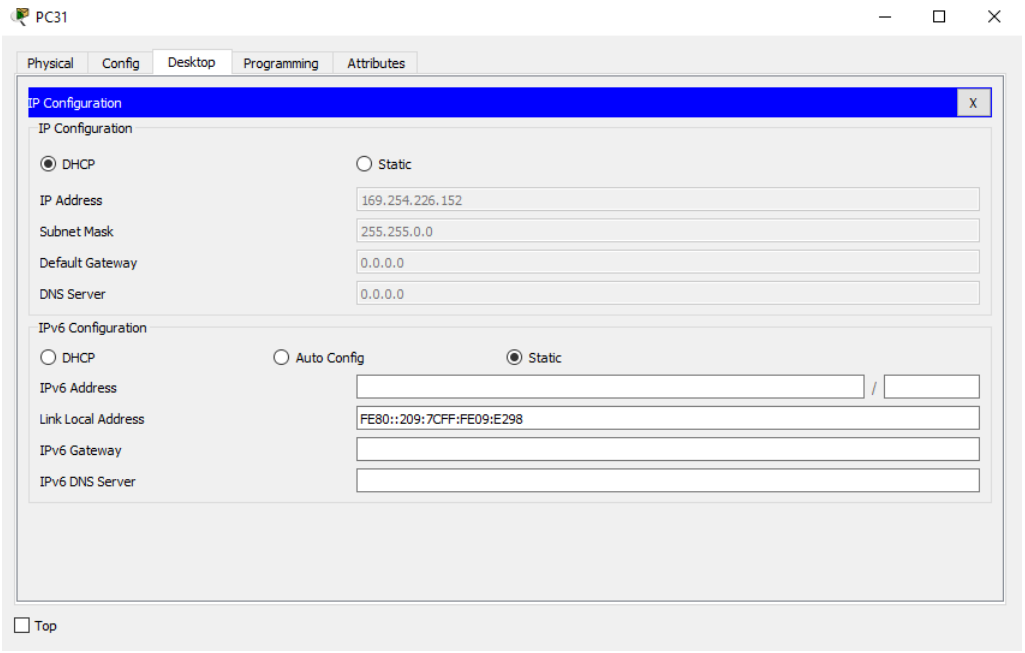


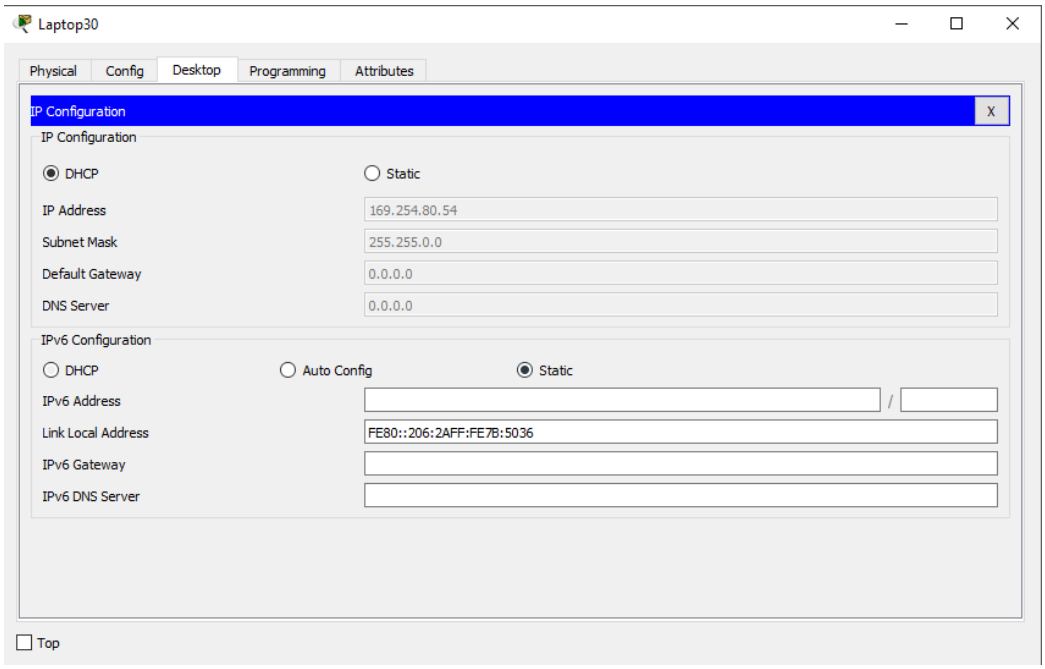


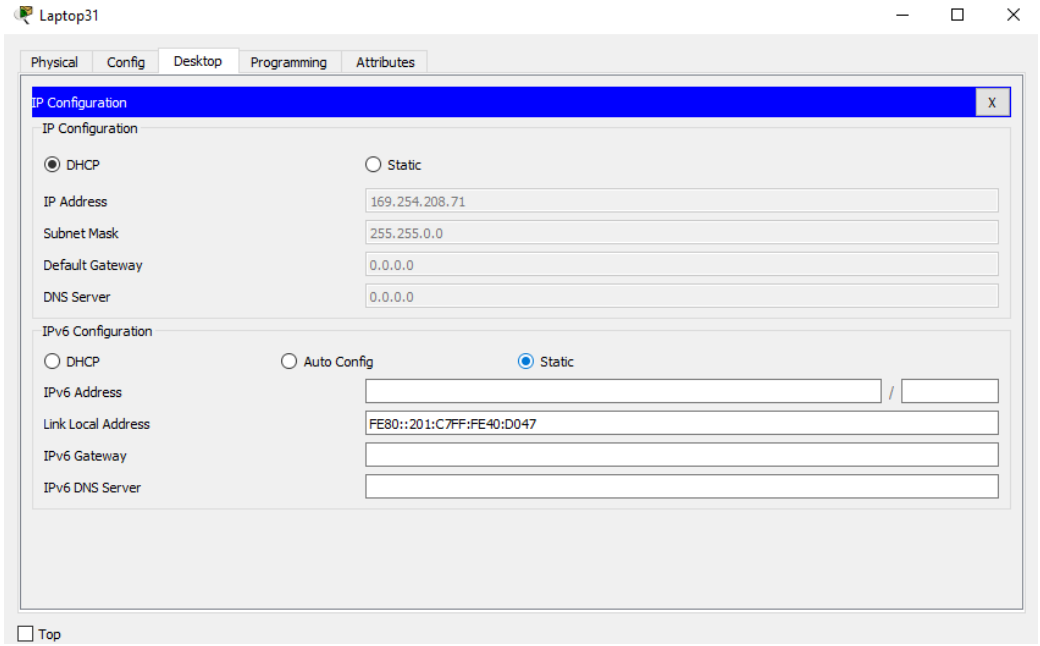

Laptop20
Physical
Config
Desktop
Programming
Attributes
IP Configuration
X
IP Configuration
DHCP
Static
IP Address
169.254.133.230
Subnet Mask
255.255.0.0
Default Gateway
0.0.0.0
DNS Server
0.0.0.0
IPv6 Configuration
DHCP
Auto Config
Static
IPv6 Address
Link Local Address
FE80::290:21FF:FE2C:85E6
IPv6 Gateway
IPv6 DNS Server


Laptop21
Physical
Config
Desktop
Programming
Attributes
IP Configuration
X
IP Configuration
DHCP
Static
IP Address
169.254.125.93
Subnet Mask
255.255.0.0
Default Gateway
0.0.0.0
DNS Server
0.0.0.0
IPv6 Configuration
DHCP
Auto Config
Static
IPv6 Address
Link Local Address
FE80::203:E4FF:FEB2:7D5D
IPv6 Gateway
IPv6 DNS Server


PC30
Physical
Config
Desktop
Programming
Attributes
IP Configuration
X
IP Configuration
DHCP
Static
IP Address
169.254.176.144
Subnet Mask
255.255.0.0
Default Gateway
0.0.0.0
DNS Server
0.0.0.0
IPv6 Configuration
DHCP
Auto Config
Static
IPv6 Address
Link Local Address
FE80::2D0:FFFF:FE43:B090
IPv6 Gateway
IPv6 DNS Server
Top


PC31
Physical
Config
Desktop
Programming
Attributes
IP Configuration
X
IP Configuration
DHCP
Static
IP Address
169.254.226.152
Subnet Mask
255.255.0.0
Default Gateway
0.0.0.0
DNS Server
0.0.0.0
IPv6 Configuration
DHCP
Auto Config
Static
IPv6 Address
Link Local Address
FE80::209:7CFF:FE09:E298
IPv6 Gateway
IPv6 DNS Server
Top


Laptop30
Physical
Config
Desktop
Programming
Attributes
IP Configuration
X
IP Configuration
DHCP
Static
IP Address
169.254.80.54
Subnet Mask
255.255.0.0
Default Gateway
0.0.0.0
DNS Server
0.0.0.0
IPv6 Configuration
DHCP
Auto Config
Static
IPv6 Address
Link Local Address
FE80::206:2AFF:FE7B:5036
IPv6 Gateway
IPv6 DNS Server
Top


Laptop31
Physical
Config
Desktop
Programming
Attributes
IP Configuration
X
IP Configuration
DHCP
Static
IP Address
169.254.208.71
Subnet Mask
255.255.0.0
Default Gateway
0.0.0.0
DNS Server
0.0.0.0
IPv6 Configuration
DHCP
Auto Config
Static
IPv6 Address
Link Local Address
FE80::201:C7FF:FE40:D047
IPv6 Gateway
IPv6 DNS Server
Top

3.5 R1 debe realizar una NAT con sobrecarga sobre una dirección IPv4 pública. Asegúrese de que todos los terminales pueden comunicarse con Internet pública (haga ping a la dirección ISP) y la lista de acceso estándar se llama INSIDE-DEVS.

3.5.1 Creamos la lista de control de acceso usando el comando Access-list

```
R1>enable
R1#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#ip access-list standard INSIDE-DEVS
R1(config-std-nacl)#permit 192.168.20.0 0.0.1.255
R1(config-std-nacl)#end
```

3.5.2 NAT con sobrecarga

```
R1>enable
R1#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#nat inside source list 1 interface serial 0/0/0 overload
R1(config)#interface s0/1/0
R2(config-if)#ip nat inside
R1(config)#interface s0/0/0
R2(config-if)#ip nat outside
```

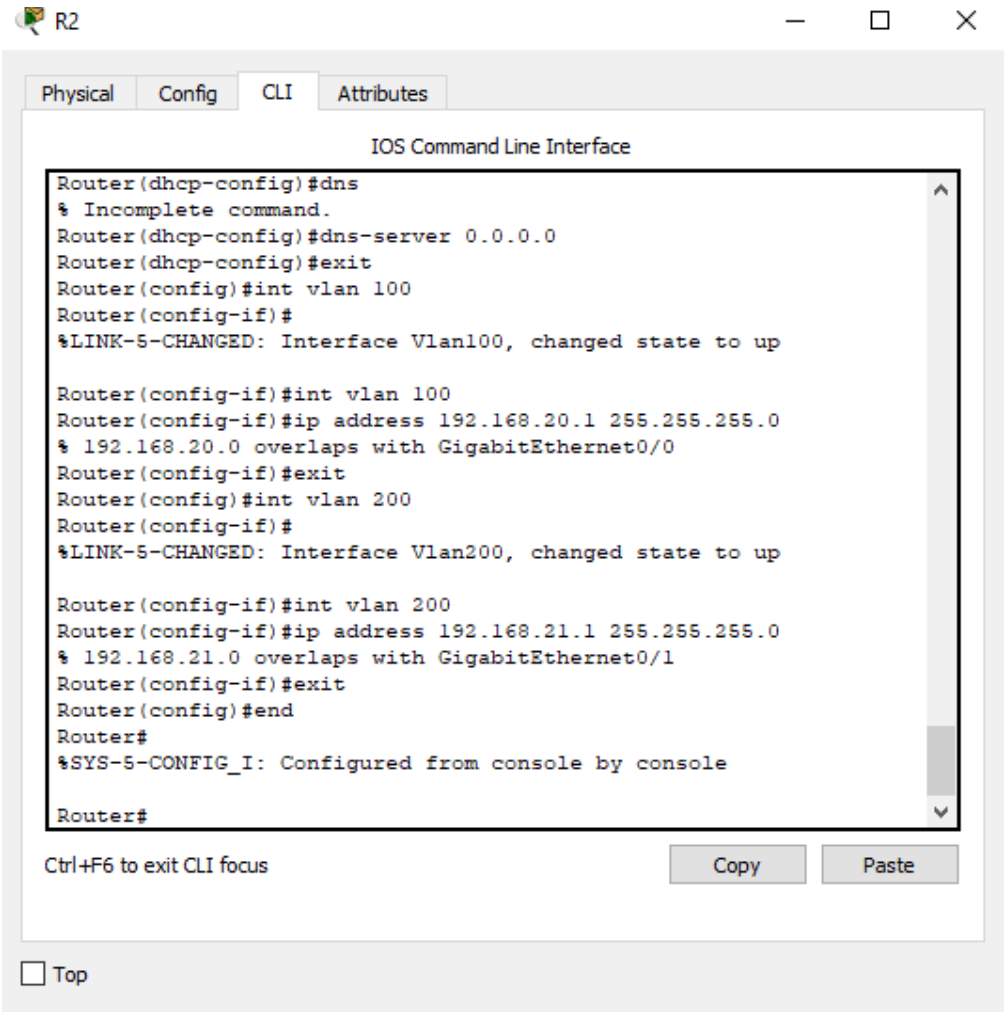
3.6 R1 debe tener una ruta estática predeterminada al ISP que se configuró yque incluye esa ruta en el dominio RIPv2.

```
R1>enable
R1#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#ip route 0.0.0.0 0.0.0.0 10.0.0.1
R1(config)#router rip
R1(config-router)#version 2
R1(config-router)#network 200.123.211.0
R1(config-router)#network 10.0.0.1
R1(config-router)#network 10.0.0.5
R1(config-router)#end
```

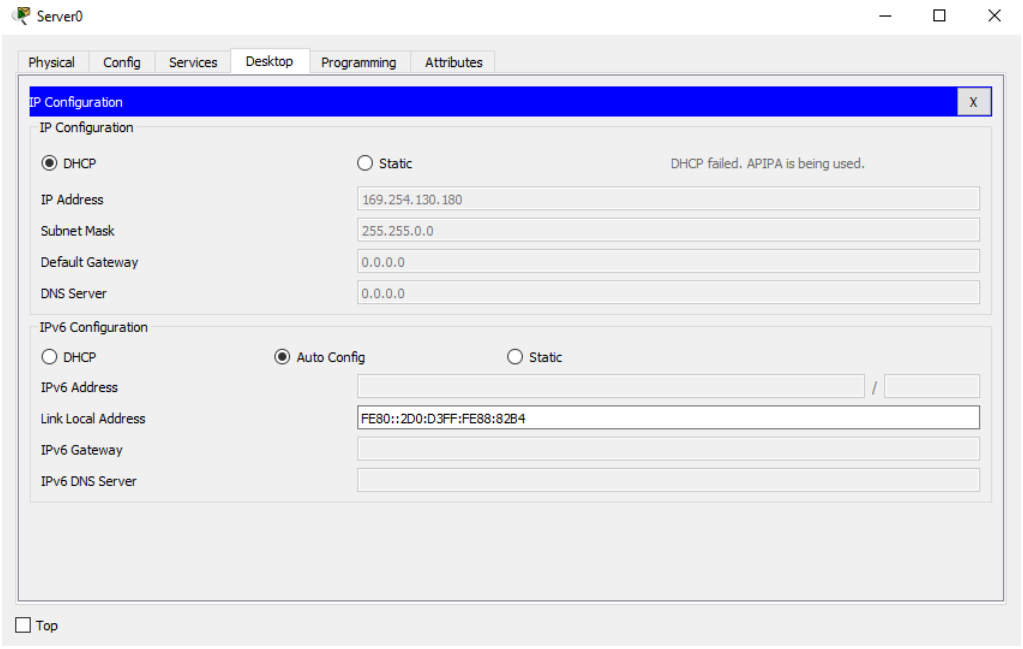
3.7 R2 es un servidor de DHCP para los dispositivos conectados al puerto FastEthernet0/0.

```
R2>enable
R2#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#ip dhcp excluded-address 192.168.20.1
R2(config)#ip dhcp excluded-address 192.168.21.1
R2(config)#ip dhcp pool fa0/0.100
R2(dhcp-config)#network 192.168.20.0 255.255.255.0
R2(dhcp-config)#default-router 192.168.20.1
R2(dhcp-config)#dns-server 200.123.211.1
R2(dhcp-config)#exit
R2(config)#ip dhcp pool fa0/0.200
R2(dhcp-config)#network 192.168.21.0 255.255.255.0
R2(dhcp-config)#default-router 192.168.21.1
R2(dhcp-config)#dns-server 200.123.211.1
R2(dhcp-config)#
```

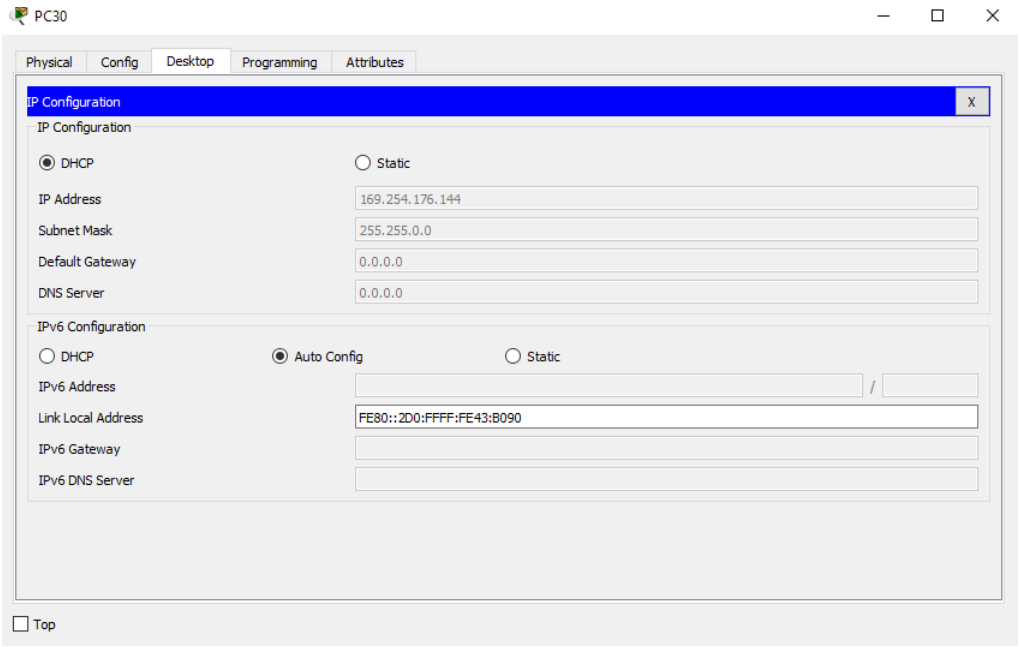
3.8 R2 debe, además de enrutamiento a otras partes de la red, ruta entre las VLAN 100 y 200.

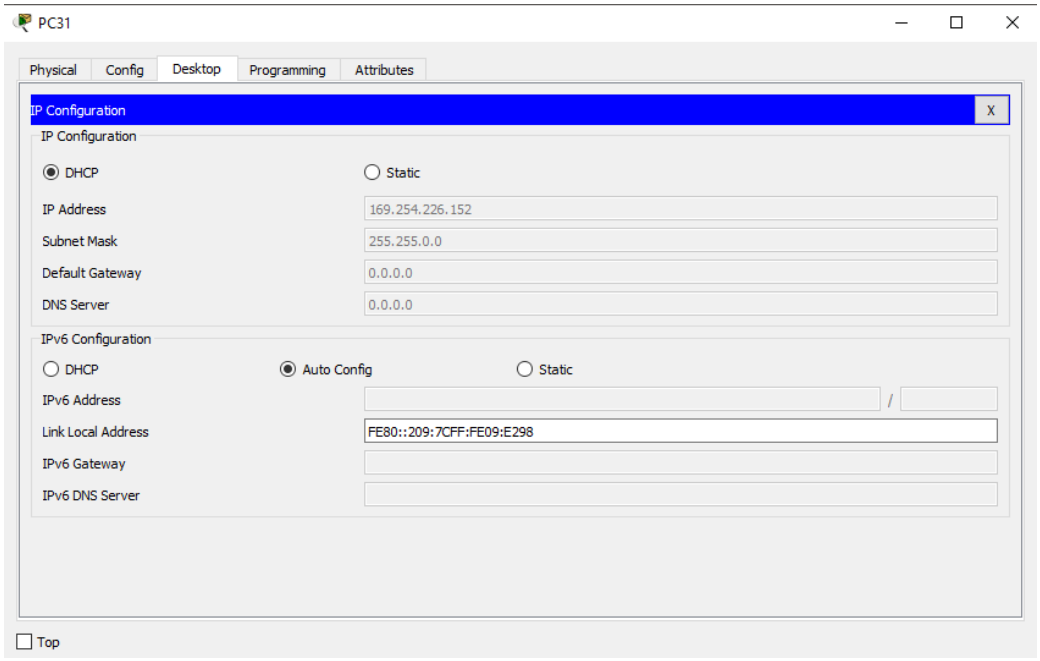


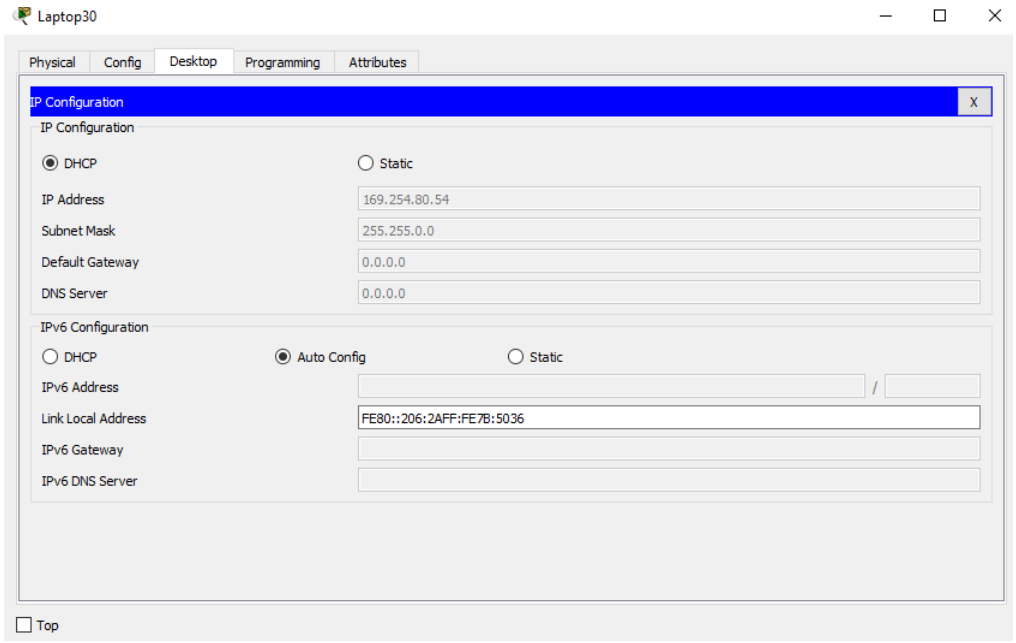
3.9 El Servidor0 es sólo un servidor IPv6 y solo debe ser accesibles para los dispositivos en R3 (ping).

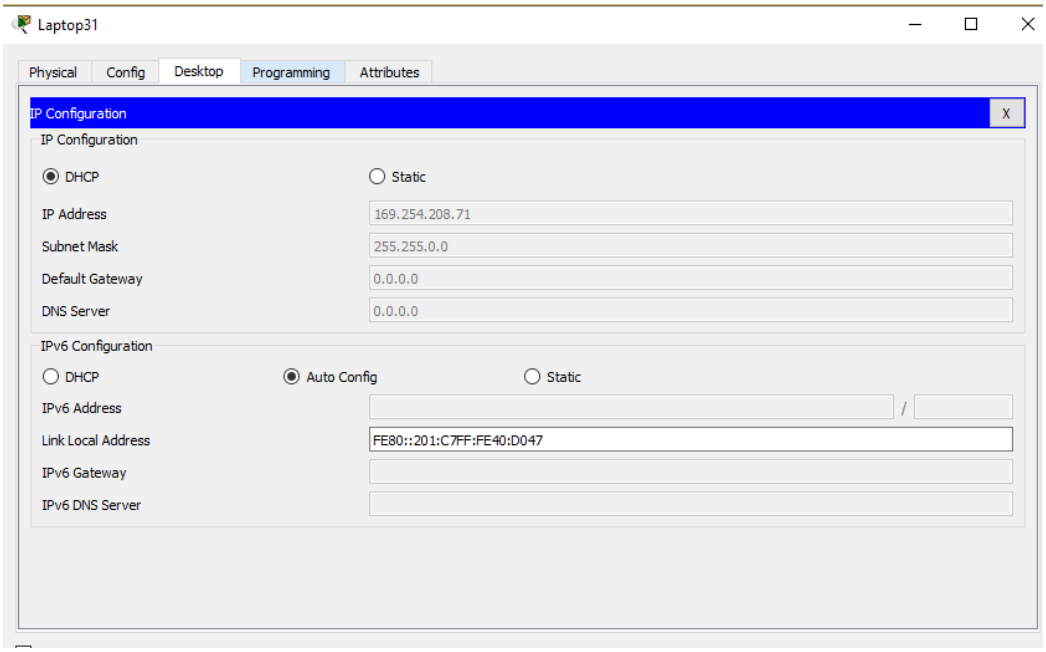


3.10 La NIC instalado en direcciones IPv4 e IPv6 de Laptop30, de Laptop31, de PC30 y obligación de configurados PC31 simultáneas (dual-stack). Las direcciones se deben configurar mediante DHCP y DHCPv6.




PC31
Physical
Config
Desktop
Programming
Attributes
IP Configuration
X
IP Configuration
DHCP
Static
IP Address
169.254.226.152
Subnet Mask
255.255.0.0
Default Gateway
0.0.0.0
DNS Server
0.0.0.0
IPv6 Configuration
DHCP
Auto Config
Static
IPv6 Address
Link Local Address
FE80::209:7CFF:FE09:E298
IPv6 Gateway
IPv6 DNS Server
Top

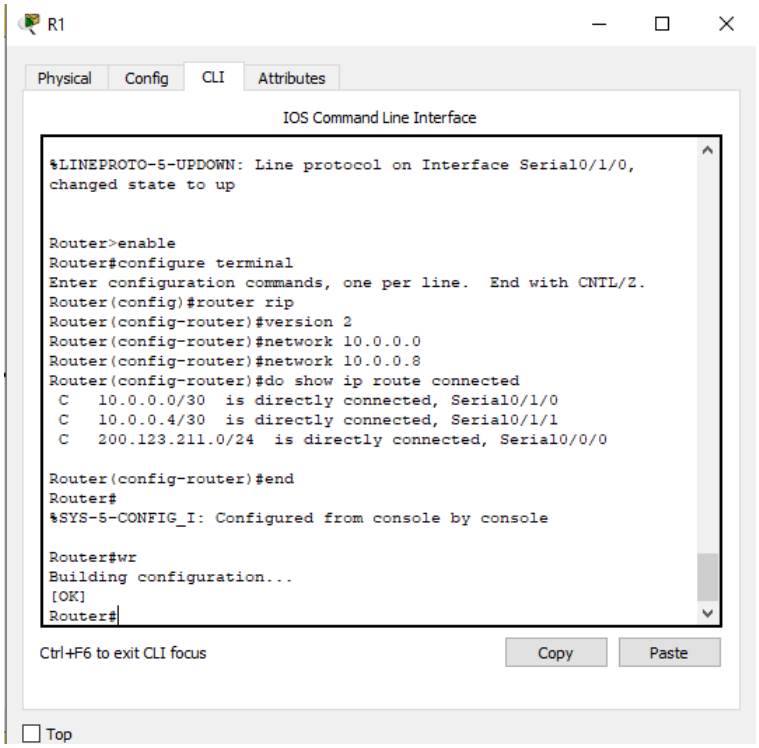

Laptop30
Physical
Config
Desktop
Programming
Attributes
IP Configuration
X
IP Configuration
DHCP
Static
IP Address
169.254.80.54
Subnet Mask
255.255.0.0
Default Gateway
0.0.0.0
DNS Server
0.0.0.0
IPv6 Configuration
DHCP
Auto Config
Static
IPv6 Address
Link Local Address
FE80::206:2AFF:FE7B:5036
IPv6 Gateway
IPv6 DNS Server
Top

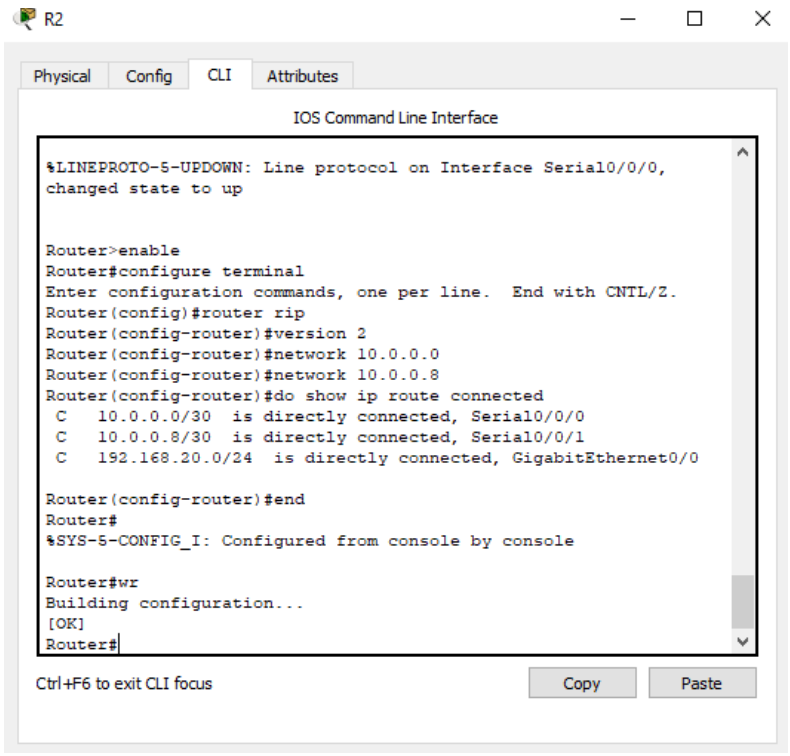


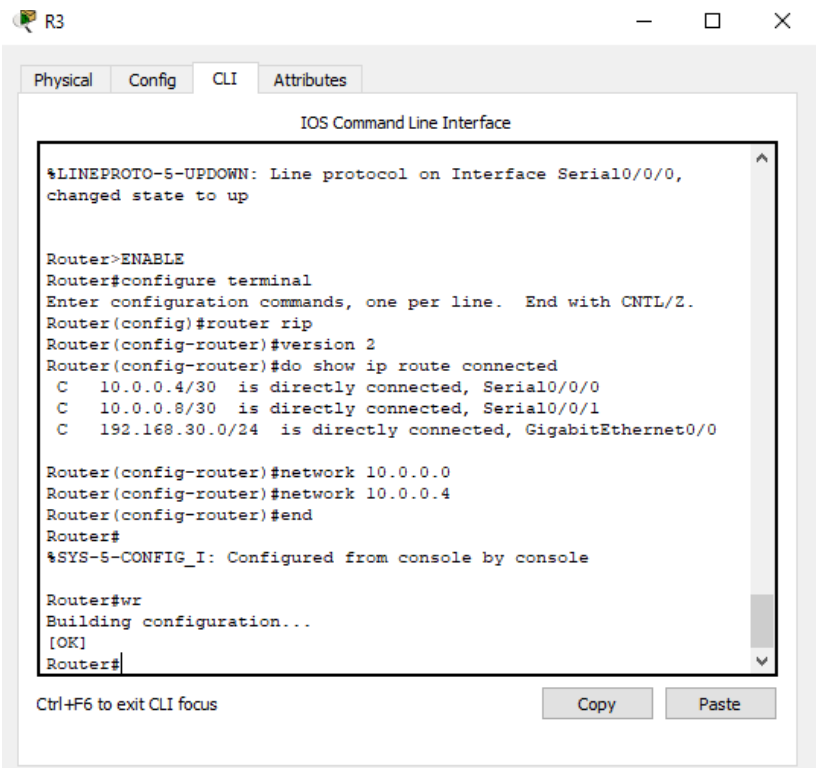
3.11 La interfaz FastEthernet 0/0 del R3 también deben tener direcciones IPv4 e IPv6 configuradas (dual- stack).

```
Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ipv6 unicast-routing
Router(config)#int g0/0
Router(config-if)#ipv6 enable
Router(config-if)#ip address 192.168.30.1 255.255.255.0
Router(config-if)#ipv6 address 2001:db8:130::9C0:80F:301/64
Router(config-if)#no shutdown
Router(config-if)#
```

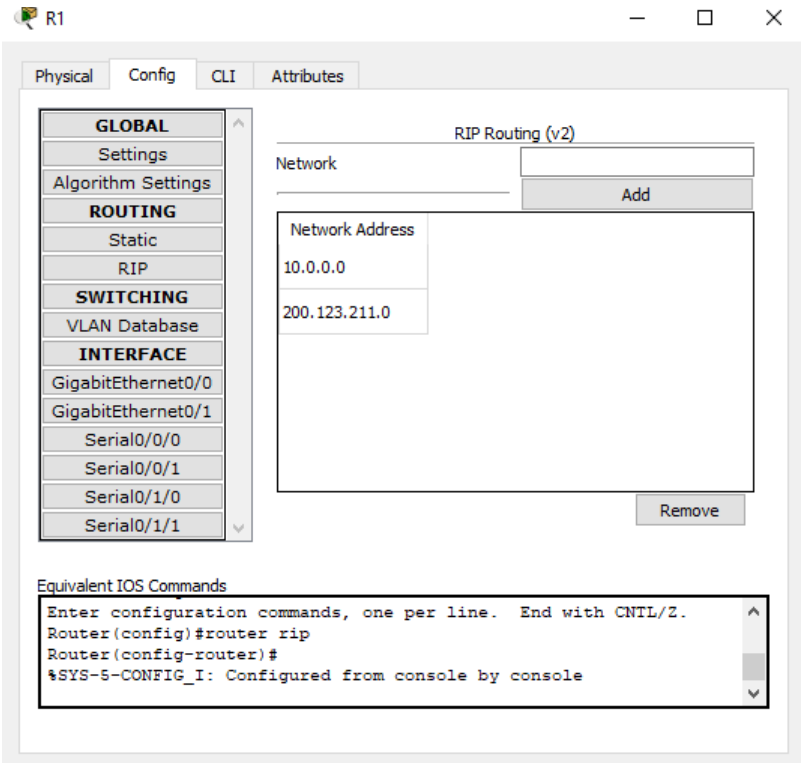
3.12 R1, R2 y R3 intercambian información de routing mediante RIP versión 2.

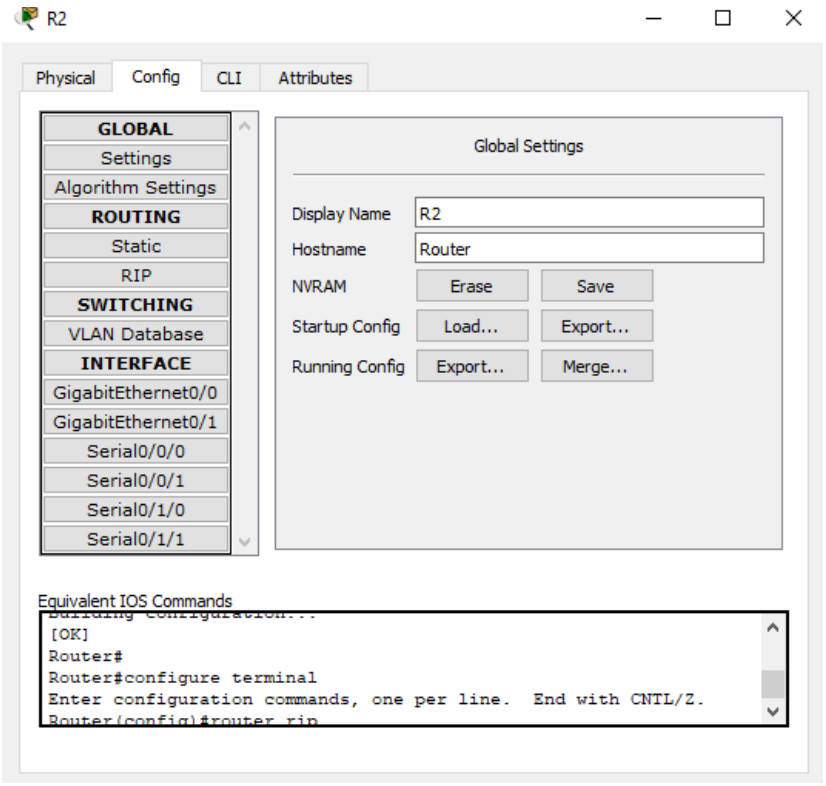


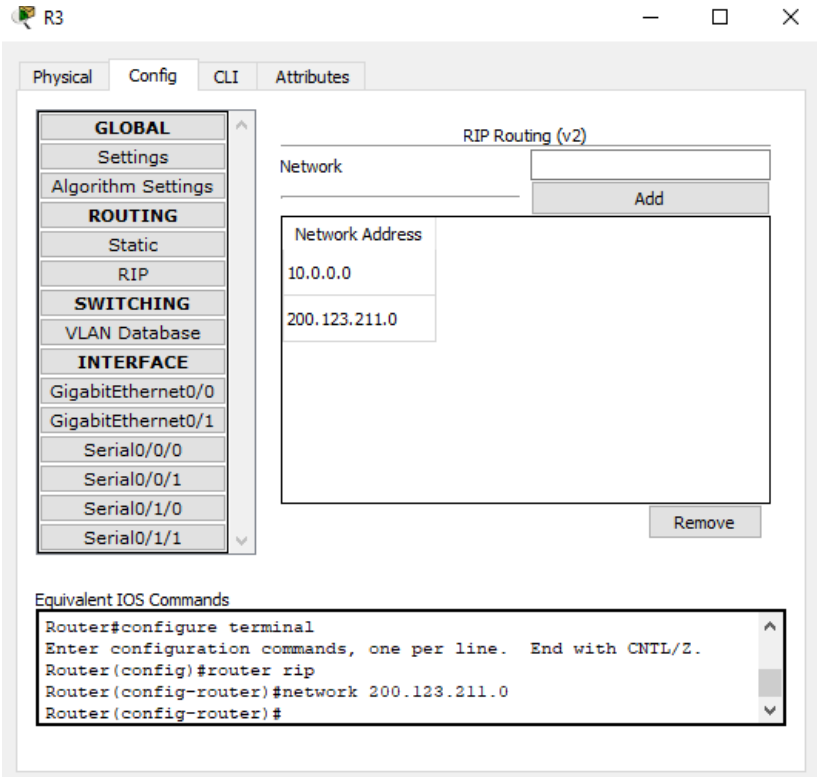




3.13 R1, R2 y R3 deben saber sobre las rutas de cada uno y la ruta predeterminada desde R1.




R2
Physical
Config
CLI
Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
GigabitEthernet0/0
GigabitEthernet0/1
Serial0/0/0
Serial0/0/1
Serial0/1/0
Serial0/1/1
Global Settings
Display Name
R2
Hostname
Router
NVRAM
Erase
Save
Startup Config
Load...
Export...
Running Config
Export...
Merge...
Equivalent IOS Commands
[OK]
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router rip


R3
Physical
Config
CLI
Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
GigabitEthernet0/0
GigabitEthernet0/1
Serial0/0/0
Serial0/0/1
Serial0/1/0
Serial0/1/1
RIP Routing (v2)
Network
Add
Network Address
10.0.0.0
200.123.211.0
Remove
Equivalent IOS Commands
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router rip
Router(config-router)#network 200.123.211.0
Router(config-router)#

3.14 Verifique la conectividad. Todos los terminales deben poder hacer ping entre sí y a la dirección IP del ISP. Los terminales bajo el R3 deberían poder hacer IPv6-ping entre ellos y el servidor.

Ping PC 3

```
Packet Tracer PC Command Line 1.0
C:\>ping 200.123.211.1

Pinging 200.123.211.1 with 32 bytes of data:

Reply from 200.123.211.1: bytes=32 time=2ms TTL=253
Reply from 200.123.211.1: bytes=32 time=7ms TTL=253
Reply from 200.123.211.1: bytes=32 time=2ms TTL=253
Reply from 200.123.211.1: bytes=32 time=2ms TTL=253

Ping statistics for 200.123.211.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 2ms, Maximum = 7ms, Average = 3ms
```

Ping Laptop

```
Packet Tracer PC Command Line 1.0
C:\>ping 200.123.211.1

Pinging 200.123.211.1 with 32 bytes of data:

Reply from 200.123.211.1: bytes=32 time=2ms TTL=253
Reply from 200.123.211.1: bytes=32 time=9ms TTL=253
Reply from 200.123.211.1: bytes=32 time=2ms TTL=253
Reply from 200.123.211.1: bytes=32 time=2ms TTL=253

Ping statistics for 200.123.211.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 2ms, Maximum = 9ms, Average = 3ms
```

Ping IPV6

```
Packet Tracer PC Command Line 1.0
C:\>ping 2001:DB8:130:0:201:63FF:FEC5:EA95

Pinging 2001:DB8:130:0:201:63FF:FEC5:EA95 with 32 bytes of data:

Reply from 2001:DB8:130:0:201:63FF:FEC5:EA95: bytes=32 time=45ms TTL=128
Reply from 2001:DB8:130:0:201:63FF:FEC5:EA95: bytes=32 time<1ms TTL=128
Reply from 2001:DB8:130:0:201:63FF:FEC5:EA95: bytes=32 time<1ms TTL=128
Reply from 2001:DB8:130:0:201:63FF:FEC5:EA95: bytes=32 time<1ms TTL=128

Ping statistics for 2001:DB8:130:0:201:63FF:FEC5:EA95:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 45ms, Average = 11ms
```

Conectividad con ISP

```
C:\>ping 200.123.211.1

Pinging 200.123.211.1 with 32 bytes of data:

Reply from 200.123.211.1: bytes=32 time=7ms TTL=253
Reply from 200.123.211.1: bytes=32 time=2ms TTL=253
Reply from 200.123.211.1: bytes=32 time=2ms TTL=253
Reply from 200.123.211.1: bytes=32 time=2ms TTL=253
```

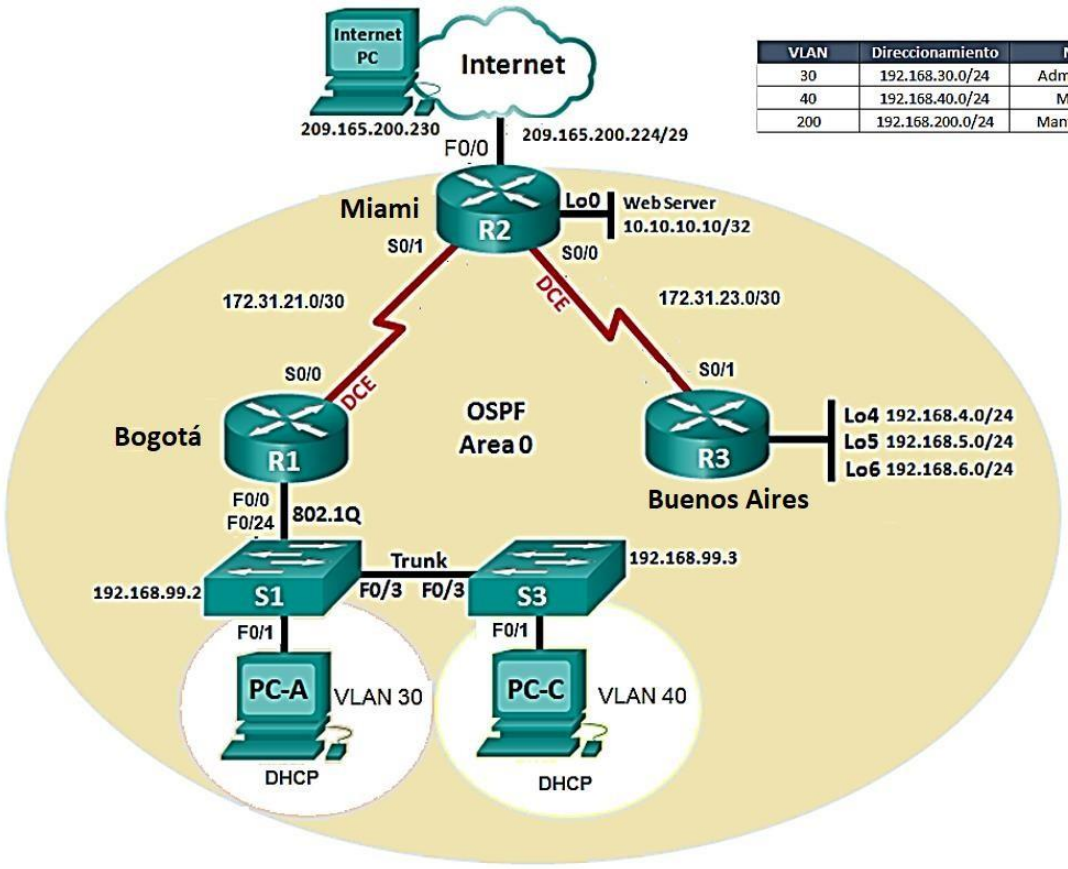
Resultados de simulación

PDU List Window

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	Laptop31	Server0	ICMP		0.000	N	0	(edit)	
	Successful	Laptop30	Server0	ICMP		0.000	N	1	(edit)	
	Successful	PC30	Server0	ICMP		0.000	N	2	(edit)	
	Successful	PC31	Server0	ICMP		0.000	N	3	(edit)	

4. 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

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

ROUTER 1: BOGOTA

```
Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#no ip domain-lookup
Router(config)#hostname R1
R1(config)#enable secret class
R1(config)#line console 0
R1(config-line)#password cisco
R1(config-line)#login
R1(config-line)#exit
R1(config)#line vty 0 4
R1(config-line)#password cisco
R1(config-line)#login
R1(config-line)#exit
R1(config)#service password-encryption
R1(config)#banner motd $Acceso no Autorizado$
R1(config)#int s0/0/0
R1(config-if)#desciption Coneccion a R2
R1(config-if)#ip address 172.31.21.1 255.255.255.252
R1(config-if)#clock rate 128000
R1(config-if)#no shutdown
```

ROUTER 2: MIAMI

```
Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#no ip domain-lookup
Router(config)#hostname R2
R2(config)#enable secret class
R2(config)#line console 0
R2(config-line)#password cisco
R2(config-line)#login
R2(config-line)#exit
R2(config)#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 $Acceso no Autorizado$
R2(config)#int s0/0/1
R2(config-if)#description coneccion a R1
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

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

R2(config-if)#exit
R2(config)#int 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)#clock rate 128000
This command applies only to DCE interfaces
R2(config-if)#exit
R2(config)#int g0/0
R2(config-if)#description coneccion a Internet
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 GigabitEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0,
changed state to up
clock rate 128000
^
% Invalid input detected at '^' marker.
R2(config-if)#clock rate 128000
^
% Invalid input detected at '^' marker.
R2(config-if)#exit
R2(config)#int g0/1
R2(config-if)#ip address 10.10.10.1 255.255.255.0
R2(config-if)#no shutdown
```

ROUTER 3: BUENOS AIRES

```
Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#no ip domain-lookup
Router(config)#hostname R3
R3(config)#enable secret class
R3(config)#line console 0
R3(config-line)#password cisco
R3(config-line)#login
R3(config-line)#exit
R3(config)#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 $Acceso no Autorizado$
R3(config)#int 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)#int lo4

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

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

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

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

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

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

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

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

R3(config-if)#ip address 192.168.6.1 255.255.255.0
R3(config-if)#no shutdown
R3(config-if)#exit
R3(config)#exit
R3#
%SYS-5-CONFIG_I: Configured from console by console

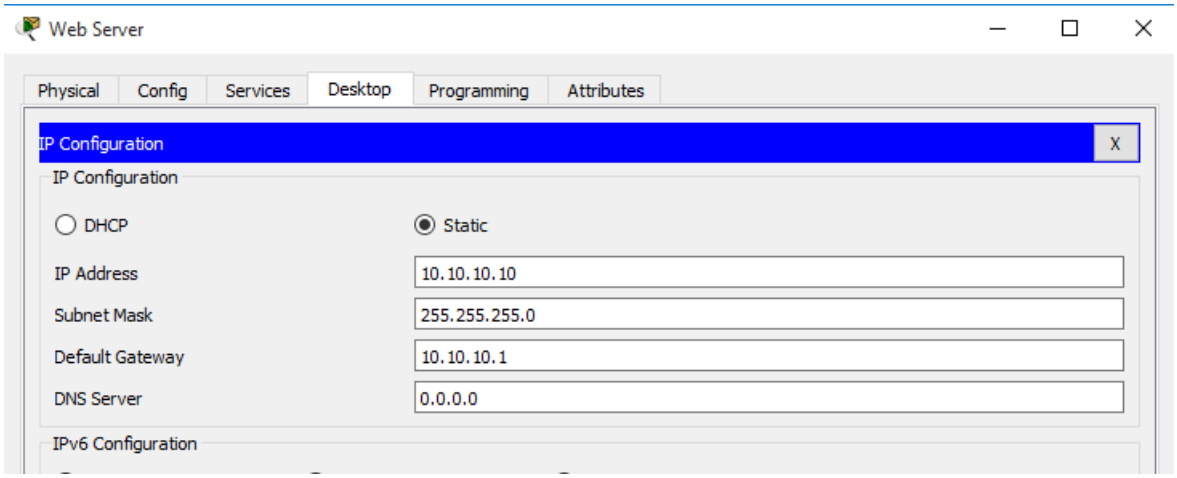
Switch 1: S1

Switch>enable
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
S1(config)#no ip domain-lookup
S1(config)#hostname S1
S1(config)#enable secret class
S1(config)#line console 0
S1(config-line)#password cisco
S1(config-line)#login
S1(config-line)#exit
S1(config)#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 $Accesso no Autorizado$
S1(config)#exit

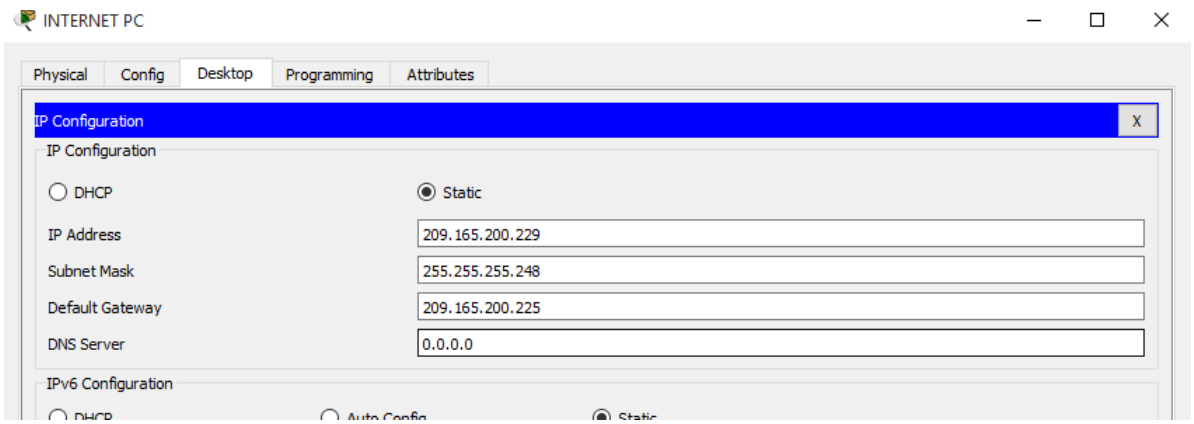
Switch 2: S3

```
Switch>enable
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#no ip domain-lookup
Switch(config)#hostname S3
S3(config)#enable secret class
S3(config)#line console 0
S3(config-line)#password cisco
S3(config-line)#login
S3(config-line)#exit
S3(config)#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 $Accesso no Autorizado$
S3(config)#exit
```

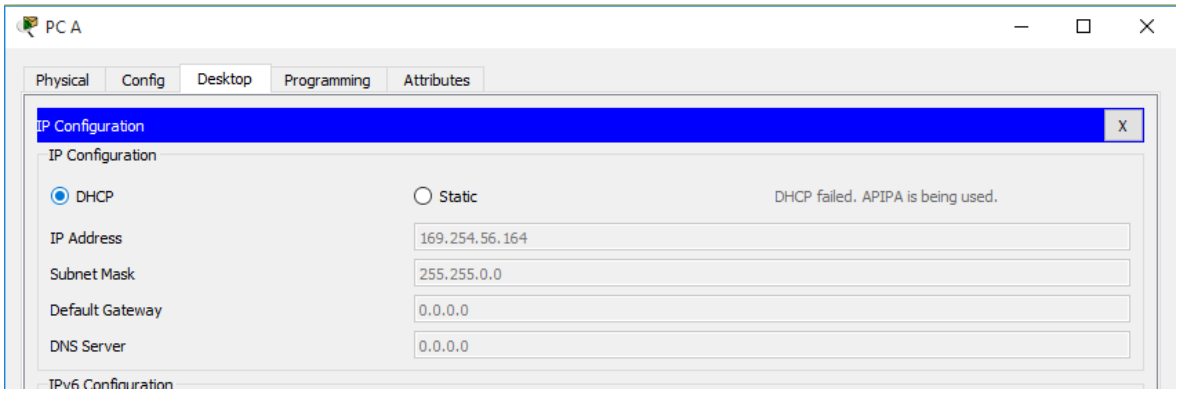
SERVER: WEB SERVER



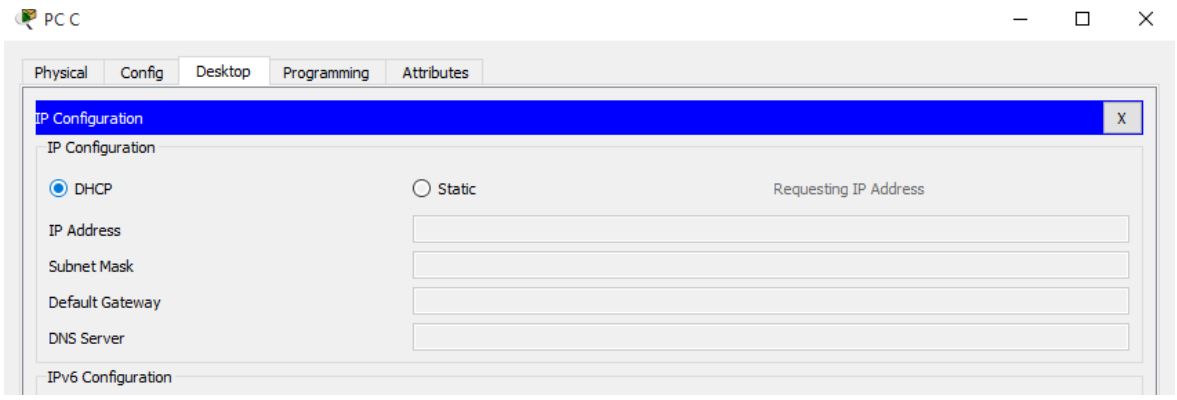
PC: INTERNET PC



PC1: PC A



PC2: PC C



4.2 Configuraremos el protocolo de enrutamiento OSPFv2 para todos los router del escenario bajo los siguientes criterios:

OSPFv2 area 0

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

Router ID 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)#exit
R1(config)#interface Serial0/0/0
R1(config-if)#exit
R1(config)#int s0/0/0
R1(config-if)#bandwidth 256
R1(config-if)#ip ospf cost 9500
R1(config-if)#exit
```

Router ID R2

```
R2(config)#router ospf 1
R2(config-router)#router-id 5.5.5.5
R2(config-router)#network 172.31.21.0 0.0.0.3 area 0
R2(config-router)#
07:10:20: %OSPF-5-ADJCHG: Process 1, Nbr 1.1.1.1 on Serial0/0/1 from
LOADING to FULL, Loading Done

R2(config-router)#network 172.31.23.0 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)#exit
R2(config)#router ospf 1
R2(config-router)#int s0/0/0
R2(config-if)#bandwidth 256
R2(config-if)#int s0/0/1
R2(config-if)#bandwidth 256
R2(config-if)#ip ospf cost 9500
R2(config-if)#no shutdown

R2(config)#router ospf 1
R2(config-router)#passive-interface g0/1
R2(config-router)#auto-cost reference-bandwidth 1000
% OSPF: Reference bandwidth is changed.
Please ensure reference bandwidth is consistent across all routers.
```

Router ID R3

```
R3(config)#router ospf 1
R3(config-router)#router-id 8.8.8.8
R3(config-router)#network 172.31.23.0 0.0.0.3 area 0
07:37:07: %OSPF-5-ADJCHG: Process 1, Nbr 5.5.5.5 on Serial0/0/1 from
LOADING to FULL, Loading Done

R3(config-router)#network 192.168.4.1 0.0.0.255 area 0
R3(config-router)#network 192.168.5.1 0.0.0.255 area 0
R3(config-router)#network 192.168.6.1 0.0.0.255 area 0
R3(config-router)#int s0/0/1
R3(config-if)#bandwidth 256
R3(config-if)#ip ospf cost 9500
R3(config-if)#exit
```

Verificar la información de OSPF

- Visualizar tablas de enrutamiento y routers conectados por OSPFv2

  Aplicamos el comando “show ip ospf neighbor”

```
R1#show ip ospf neighbor

Neighbor ID     Pri   State           Dead Time   Address
Interface
5.5.5.5           0   FULL/  -        00:00:31    172.31.21.2
Serial0/0/0
R1#

R2#show ip ospf neighbor

Neighbor ID     Pri   State           Dead Time   Address
Interface
8.8.8.8           0   FULL/  -        00:00:38    172.31.23.2
Serial0/0/0
1.1.1.1           0   FULL/  -        00:00:35    172.31.21.1
Serial0/0/1
R2#

R3#show ip ospf neighbor

Neighbor ID     Pri   State           Dead Time   Address
Interface
5.5.5.5           0   FULL/  -        00:00:33    172.31.23.1
Serial0/0/1
R3#
```

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

Aplicamos el comando "show ip ospf interface"

R1

```
R1#show ip ospf interface

Serial0/0/0 is up, line protocol is up
  Internet address is 172.31.21.1/30, Area 0
  Process ID 1, Router ID 1.1.1.1, Network Type POINT-TO-POINT,
Cost: 9500
  Transmit Delay is 1 sec, State POINT-TO-POINT, Priority 0
  No designated router on this network
  No backup designated router on this network
  Timer intervals configured, Hello 10, Dead 40, Wait 40,
Retransmit 5
    Hello due in 00:00:00
  Index 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#
```

R2

```
R2#show ip ospf interface

Serial0/0/1 is up, line protocol is up
  Internet address is 172.31.21.2/30, Area 0
  Process ID 1, Router ID 5.5.5.5, Network Type POINT-TO-POINT,
Cost: 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 00:00:08
  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 1.1.1.1
  Suppress hello for 0 neighbor(s)
Serial0/0/0 is up, line protocol is up
  Internet address is 172.31.23.1/30, Area 0
  Process ID 1, Router ID 5.5.5.5, Network Type POINT-TO-POINT,
Cost: 647
  Transmit Delay is 1 sec, State POINT-TO-POINT, Priority 0
  No designated router on this network
  No backup designated router on this network
 --More--
```

R3

```
R3#show ip ospf interface

Serial0/0/1 is up, line protocol is up
  Internet address is 172.31.23.2/30, Area 0
  Process ID 1, Router ID 8.8.8.8, 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 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)
Loopback4 is up, line protocol is up
  Internet address is 192.168.4.1/24, Area 0
  Process ID 1, Router ID 8.8.8.8, Network Type LOOPBACK, Cost: 1
  Loopback interface is treated as a stub Host
Loopback5 is up, line protocol is up
  Internet address is 192.168.5.1/24, Area 0
 --More--
```

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

Aplicamos el comando “show ip protocols”

R1

```
R1#show ip protocols

Routing Protocol is "ospf 1"
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Router ID 1.1.1.1
  Number of areas in this router is 1. 1 normal 0 stub 0 nssa
  Maximum path: 4
  Routing for Networks:
    172.31.21.0 0.0.0.3 area 0
    192.168.30.0 0.0.0.255 area 0
    192.168.40.0 0.0.0.255 area 0
    192.168.200.0 0.0.0.255 area 0
  Routing Information Sources:
    Gateway         Distance      Last Update
    1.1.1.1              110      00:04:28
    5.5.5.5              110      00:19:01
    8.8.8.8              110      00:14:50
  Distance: (default is 110)
```

R2

```
R2#show ip protocols

Routing Protocol is "ospf 1"
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Router ID 5.5.5.5
  Number of areas in this router is 1. 1 normal 0 stub 0 nssa
  Maximum path: 4
  Routing for Networks:
    172.31.21.0 0.0.0.3 area 0
    172.31.23.0 0.0.0.3 area 0
    10.10.10.0 0.0.0.255 area 0
  Passive Interface(s):
    GigabitEthernet0/1
  Routing Information Sources:
    Gateway         Distance      Last Update
    1.1.1.1              110      00:06:32
    5.5.5.5              110      00:21:05
    8.8.8.8              110      00:16:53
  Distance: (default is 110)
```

R3

```
R3#show ip protocols

Routing Protocol is "ospf 1"
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Router ID 8.8.8.8
  Number of areas in this router is 1. 1 normal 0 stub 0 nssa
  Maximum path: 4
  Routing for Networks:
    172.31.23.0 0.0.0.3 area 0
    192.168.4.0 0.0.0.255 area 0
    192.168.5.0 0.0.0.255 area 0
    192.168.6.0 0.0.0.255 area 0
  Routing Information Sources:
    Gateway         Distance      Last Update
    1.1.1.1              110      00:07:13
    5.5.5.5              110      00:21:46
    8.8.8.8              110      00:17:35
  Distance: (default is 110)
```

Aplicamos el comando “show ip route ospf”

R1

```
R1#show ip route ospf
     10.0.0.0/24 is subnetted, 1 subnets
O       10.10.10.0 [110/9510] via 172.31.21.2, 00:34:45,
Serial0/0/0
     172.31.0.0/16 is variably subnetted, 3 subnets, 2 masks
O       172.31.23.0 [110/10147] via 172.31.21.2, 00:34:55,
Serial0/0/0
     192.168.4.0/32 is subnetted, 1 subnets
O       192.168.4.1 [110/10148] via 172.31.21.2, 00:22:52,
Serial0/0/0
     192.168.5.0/32 is subnetted, 1 subnets
O       192.168.5.1 [110/10148] via 172.31.21.2, 00:22:18,
Serial0/0/0
     192.168.6.0/32 is subnetted, 1 subnets
O       192.168.6.1 [110/10148] via 172.31.21.2, 00:21:52,
Serial0/0/0

R1#
```

R2

```
R2#show ip route ospf
     192.168.4.0/32 is subnetted, 1 subnets
O       192.168.4.1 [110/648] via 172.31.23.2, 00:24:29,
Serial0/0/0
     192.168.5.0/32 is subnetted, 1 subnets
O       192.168.5.1 [110/648] via 172.31.23.2, 00:23:55,
Serial0/0/0
     192.168.6.0/32 is subnetted, 1 subnets
O       192.168.6.1 [110/648] via 172.31.23.2, 00:23:28,
Serial0/0/0

R2#
```

R3

```
R3#show ip route ospf
     10.0.0.0/24 is subnetted, 1 subnets
O       10.10.10.0 [110/9510] via 172.31.23.1, 00:23:16,
Serial0/0/1
     172.31.0.0/16 is variably subnetted, 3 subnets, 2 masks
O       172.31.21.0 [110/19000] via 172.31.23.1, 00:23:16,
Serial0/0/1

R3#
```

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

VLAN 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)#int vlan 200
S1(config-if)#
%LINK-5-CHANGED: Interface Vlan200, changed state to up

S1(config-if)#ip address 192.168.200.2 255.255.255.0
S1(config-if)#no shutdown
S1(config-if)#ip default-gateway 192.168.200.1
S1(config)#int f0/3
S1(config-if)#switchport mode trunk

S1(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3, changed
state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3, changed
state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan200, changed state to
up

S1(config-if)#switchport trunk native vlan 1
S1(config-if)#int f0/24
S1(config-if)#switchport mode trunk
S1(config-if)#switchport trunk native vlan 1
S1(config-if)#int range fa0/1-2, fa0/4-23, g1/1-2
interface range not validated - command rejected
S1(config)#int range f0/1-2, f0/4-23, g1/1-2
interface range not validated - command rejected
S1(config)#exit
S1#
%SYS-5-CONFIG_I: Configured from console by console
```

S1#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
S1(config)#int fa0/1
S1(config-if)#switchport mode access
S1(config-if)#switchport access vlan 30
S1(config-if)#

VLAN S3

S3#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
S3(config)#interface GigabitEthernet0/1
S3(config-if)#exit
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)#int vlan 200
S3(config-if)#
%LINK-5-CHANGED: Interface Vlan200, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan200, changed state to up

S3(config-if)#ip address 192.168.200.2 255.255.255.0
S3(config-if)#no shutdown
S3(config-if)#exit
S3(config)#ip default-gateway 192.168.200.1
S3(config)#int vlan 40
S3(config-if)#
%LINK-5-CHANGED: Interface Vlan40, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan40, changed state to up

S3(config-if)#ip address 192.168.40.3 255.255.255.0
S3(config-if)#no shutdown
S3(config-if)#exit
S3(config)#ip default-gateway 192.168.40.1
S3(config)#int fa0/3
S3(config-if)#switchport mode trunk

```
S3(config-if)#switchport trunk native vlan 1
S3(config-if)#exit
S3(config)#int fa0/1
S3(config-if)#switchport mode access
S3(config-if)#switchport access vlan 40
S3(config-if)#exit
```

R1 ENCAPSULACION

```
R1(config)#int g0/1.30
R1(config-subif)#description Administracion LAN
R1(config-subif)#encapsulation dot1q 30
R1(config-subif)#ip address 192.168.30.1 255.255.255.252
R1(config-subif)#int g0/1.40
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-subif)#int g0/1.30
R1(config-subif)#ip address 192.168.30.1 255.255.255.0
R1(config-subif)#exit
R1(config)#int g0/1.200
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-subif)#exit

R1(config-router)#passive-interface g0/1
R1(config-router)#passive-interface g0/1.30
R1(config-router)#passive-interface g0/1.40
R1(config-router)#passive-interface g0/1.200
R1(config-router)# auto-cost reference-bandwidth 1000

R1(config)#int s0/0/0
R1(config-if)#bandwidth 256
R1(config-if)#exit
```

4.4 En el Switch 3 deshabilitar DNS lookup

Aplicamos el comando “no ip domain-lookup”

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

4.5 Asignar direcciones IP a los Switches acorde a los lineamientos.

S1

```
S1#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
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)#vlan 200
S1(config-vlan)#name Mantenimiento
S1(config-vlan)#exit
S1(config)#int vlan 200
S1(config-if)#ip address 192.168.99.2 255.255.255.0
S1(config-if)#exit
S1(config)#ip default-gateway 192.168.99.1
S1(config)#exit
```

S3

```
S3(config)#vlan 30
S3(config-vlan)#name Administracion
S3(config-vlan)#exit
S3(config)#vlan 40
S3(config-vlan)#name Mercadeo
S3(config-vlan)#vlan 200
S3(config-vlan)#name Mantenimiento
S3(config-vlan)#exit
S3(config)#int vlan 200
S3(config-if)#ip address 192.168.99.3 255.255.255.0
S3(config-if)#exit
S3(config)#ip default-gateway 192.168.99.1
S3(config)#exit
```

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

S1

```
S1#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
S1(config)#int f0/3
S1(config-if)#switchport mode trunk
S1(config-if)#switchport trunk native vlan 1
S1(config-if)#int range fa0/1-2, fa0/4-23, g0/1-2
S1(config-if-range)#switchport mode access
S1(config-if-range)#interface fa0/1
S1(config-if)#switchport mode access
S1(config-if)#switchport access vlan 30
S1(config-if)#exit
```

S3

```
S3(config)#int fa0/3
S3(config-if)#switchport mode trunk
S3(config-if)#switchport trunk native vlan 1
S3(config-if)#int range fa0/1-2, fa0/4-23, g0/1-2
S3(config-if-range)#switchport mode access
S3(config-if-range)#interface fa0/1
S3(config-if)#switchport access vlan 40
S3(config-if)#int range fa0/1-2, fa0/4-23, g0/1-2
```

4.7 Implement DHCP and NAT for IPv4

```
R2#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#interface Serial0/0/0
R2(config-if)#exit
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 g0/0
R2(config-if)#ip nat outside
R2(config-if)#int g0/1
R2(config-if)#ip nat inside
R2(config-if)#exit
R2(config)#access-list 1 permit 192.168.30.0 0.0.0.255
R2(config)#access-list 1 permit 192.168.40.0 0.0.0.255
R2(config)#access-list 1 permit 192.168.4.0 0.0.3.255
R2(config)#ip nat pool INTERNET 209.165.200.225 209.165.200.229 netmask
255.255.255.248
```

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

```
R1(config)#ip dhcp pool vlan30
R1(dhcp-config)#network 192.168.30.0 255.255.255.0
R1(dhcp-config)#default-router 192.168.30.1
R1(dhcp-config)#ip dhcp pool vlan40
R1(dhcp-config)#network 192.168.40.0 255.255.255.0
R1(dhcp-config)#default-router 192.168.40.1
R1(dhcp-config)#ip dhcp pool vlan200
R1(dhcp-config)#network 192.168.200.0 255.255.255.0
R1(dhcp-config)#default-router 192.168.200.1
R1(dhcp-config)#exit
```

4.9 Reservar las primeras 30 direcciones IP de las VLAN 30 y 40 para configuraciones estáticas.

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

```
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)#domain-name ccna-unad.com
^
% Invalid input detected at '^' marker.
R1(dhcp-config)#default-router 192.168.30.1
R1(dhcp-config)#network 192.168.30.0 255.255.255.0
R1(dhcp-config)#

R1(dhcp-config)#ip dhcp pool Mercadeo
R1(dhcp-config)#dns-server 10.10.10.11
R1(dhcp-config)#domain-name ccna-unad.com
^
% Invalid input detected at '^' marker.
R1(dhcp-config)#default-router 192.168.40.1
R1(dhcp-config)#network 192.168.40.0 255.255.255.0
R1(dhcp-config)#
```

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

```
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 g0/0
R2(config-if)#ip nat outside
R2(config-if)#int g0/1
R2(config-if)#ip nat inside
R2(config-if)#exit
```

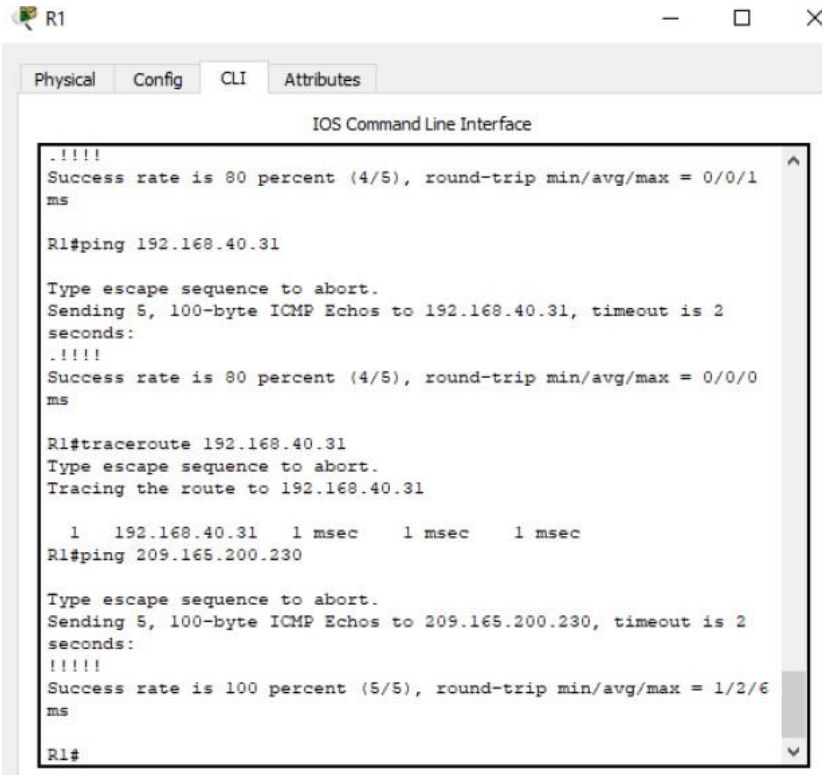
4.11 Configurar al menos dos listas de acceso de tipo estándar a su criterio en para restringir o permitir tráfico desde R1 o R3 hacia R2.

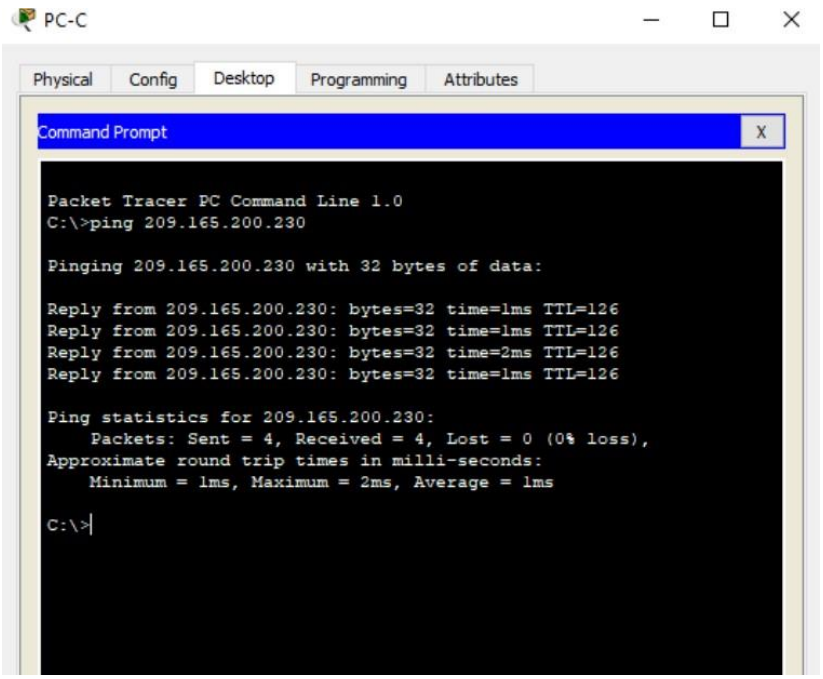
```
R2#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#access-list 1 permit 192.168.30.0 0.0.0.255
R2(config)#access-list 1 permit 192.168.40.0 0.0.0.255
R2(config)#access-list 1 permit 192.168.4.0 0.0.3.255
R2(config)#access-list 1 permit 192.168.4.0 0.0.0.255
R2(config)#ip nat pool INTERNET 209.165.200.225 200.165.200.228 netmask
255.255.255.148
%Pool INTERNET mask 255.255.255.148 too small; should be at least 0.0.0.0
%Start and end addresses on different subnets
R2(config)#ip nat pool INTERNET 209.165.200.225 200.165.200.228 netmask
255.255.255.248
%Pool INTERNET mask 255.255.255.248 too small; should be at least 0.0.0.0
%Start and end addresses on different subnets
R2(config)#ip access-list standard ADMIN123
R2(config-std-nacl)#permit host 172.31.21.1
R2(config-std-nacl)#
```

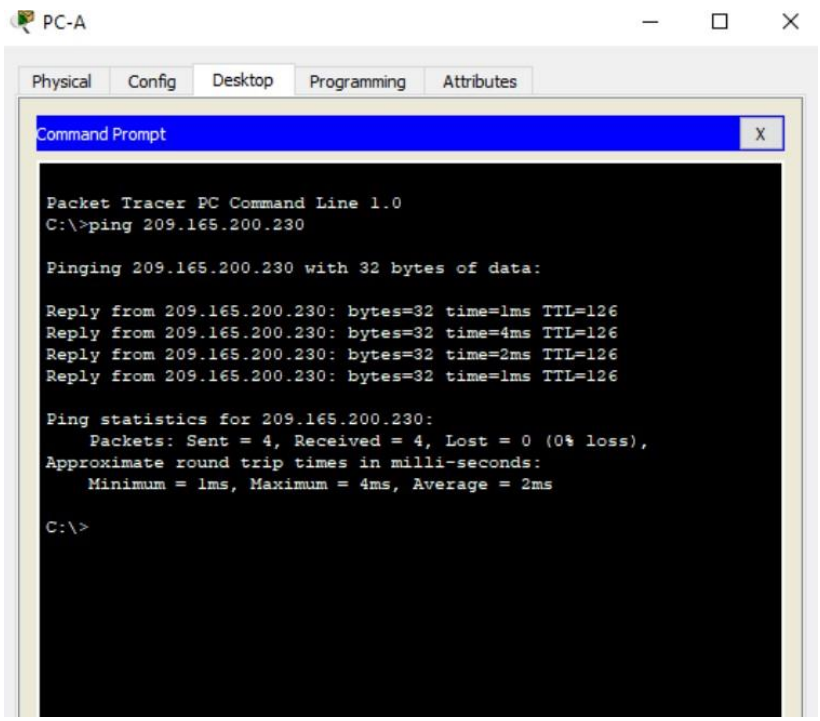
4.12 Configurar al menos dos listas de acceso de tipo extendido o nombradas a su criterio en para restringir o permitir tráfico desde R1 o R3 hacia R2.

```
R2#wr
Building configuration...
[OK]
R2#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#access-list 101 permit tcp any host 209.168.200.229 eq www
R2(config)#
```

4.13 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
X
Packet Tracer PC Command Line 1.0
C:\>ping 209.165.200.230
Pinging 209.165.200.230 with 32 bytes of data:
Reply from 209.165.200.230: bytes=32 time=1ms TTL=126
Reply from 209.165.200.230: bytes=32 time=4ms TTL=126
Reply from 209.165.200.230: bytes=32 time=2ms TTL=126
Reply from 209.165.200.230: bytes=32 time=1ms TTL=126
Ping statistics for 209.165.200.230:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 1ms, Maximum = 4ms, Average = 2ms
C:\>

5. CONCLUSIÓN

- Se logró identificar, conectar y configurar cada uno de los dispositivos que hacen parte de las topologías exigidas en los dos escenarios de las pruebas de habilidades. Logrando afianzar los conocimientos previos obtenidos durante el curso de CISCO.
- Se comprendieron y aplicaron los distintos protocolos requeridos para la configuración y conectividad de todos los dispositivos, logrando su correcto funcionamiento en el ambiente de Cisco Packet Tracer.
- Mediante la solución de los escenarios desarrolle las destrezas y habilidades adquiridas en el transcurso del programa académico. Logre aplicar la configuración adecuada a cada dispositivo e implemente correctamente los protocolos que se utilizan en el software Cisco Packet Tracer.

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