EVALUACIÓN – PRUEBA DE HABILIDADES PRÁCTICAS CCNA

POR:

BIBIANA ANDREA ENCISO CAÑAS
COD: 1039683720

GRUPO:

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TUTOR UNAD

Nilson Albeiro Ferreira

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

UNIVERSIDAD NACIONAL ABIERTA Y A DISTANCIA UNAD

2018

Tabla de Contenido

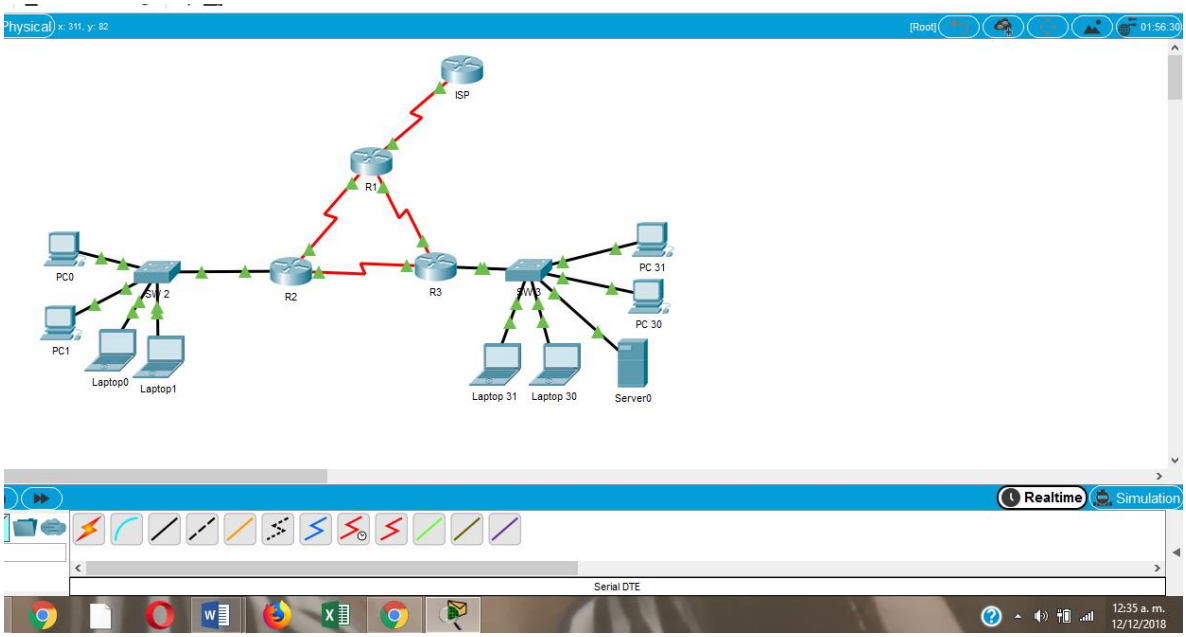
Introducción

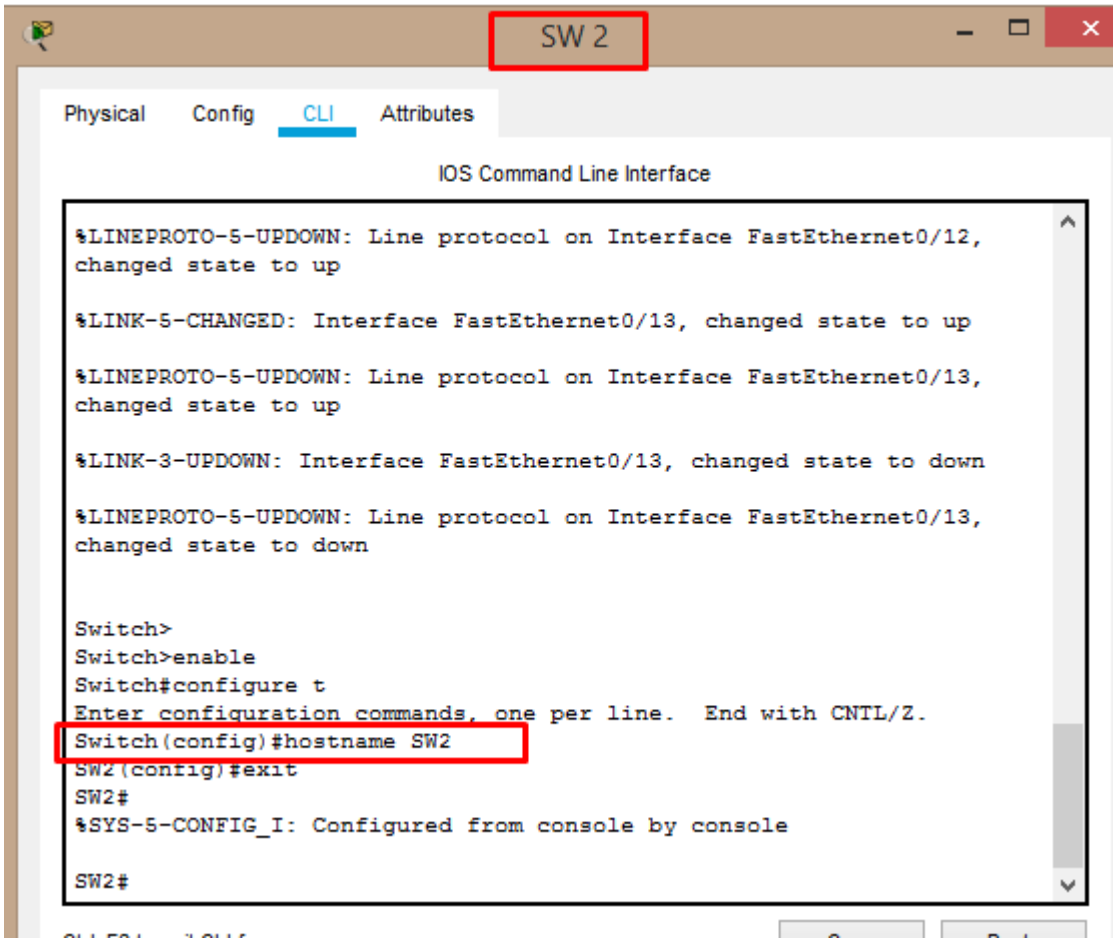
La evaluación denominada “Prueba de habilidades prácticas”, forma parte de las actividades evaluativas del Diplomado de Profundización CCNA, y busca identificar el grado de desarrollo de competencias y habilidades que fueron adquiridas a lo largo del diplomado. Lo esencial es poner a prueba los niveles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

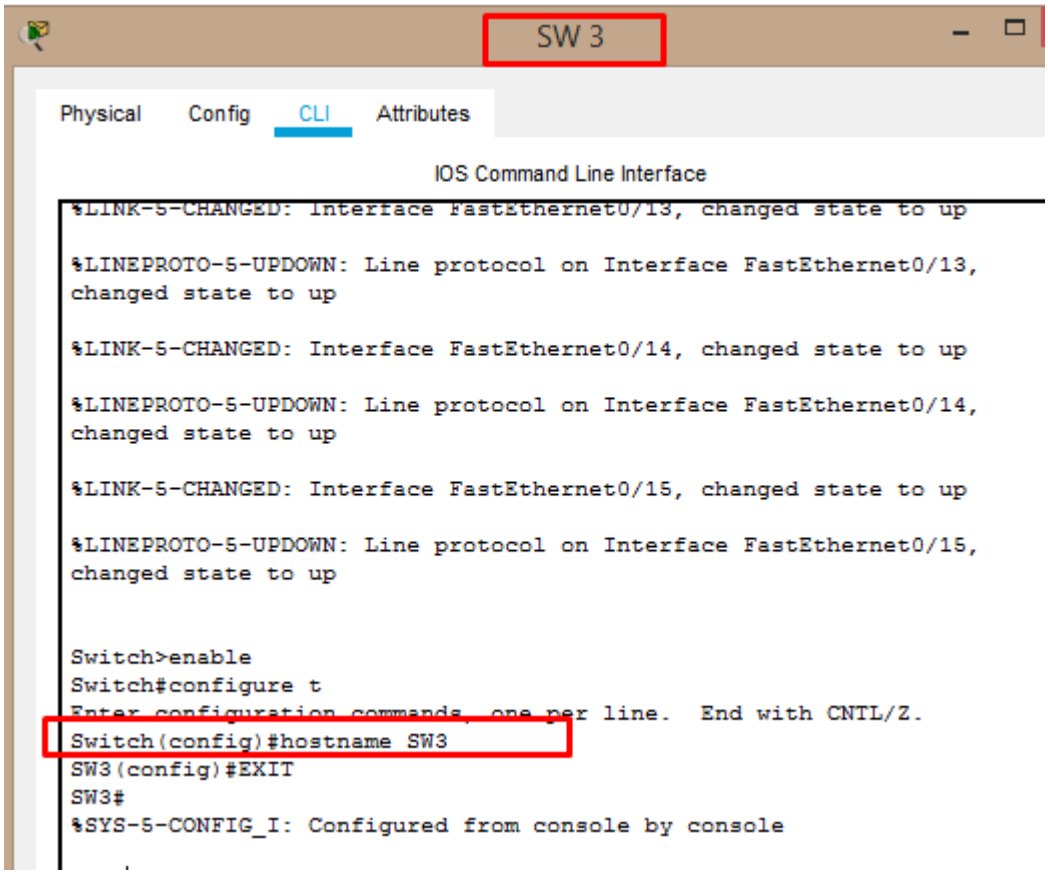
El trabajo evaluativo consiste en desarrollar dos Escenarios en la herramienta de Packet Tracer, Escenario 1: implementar NAT, servidor de DHCP, RIPV2 y el routing entre VLAN, incluida la configuración de direcciones IP, las VLAN, los enlaces troncales y las subinterfaces. Escenario 2: configurar e interconectar 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.

Las practicas debe estar acompañada de los respectivos procesos de documentación de la solución, correspondientes al registro de la configuración de cada uno de los dispositivos, la descripción detallada del paso a paso de cada una de las etapas realizadas durante su desarrollo, el registro de los procesos de verificación de conectividad mediante el uso de comandos ping, traceroute, show ip route, entre otros.

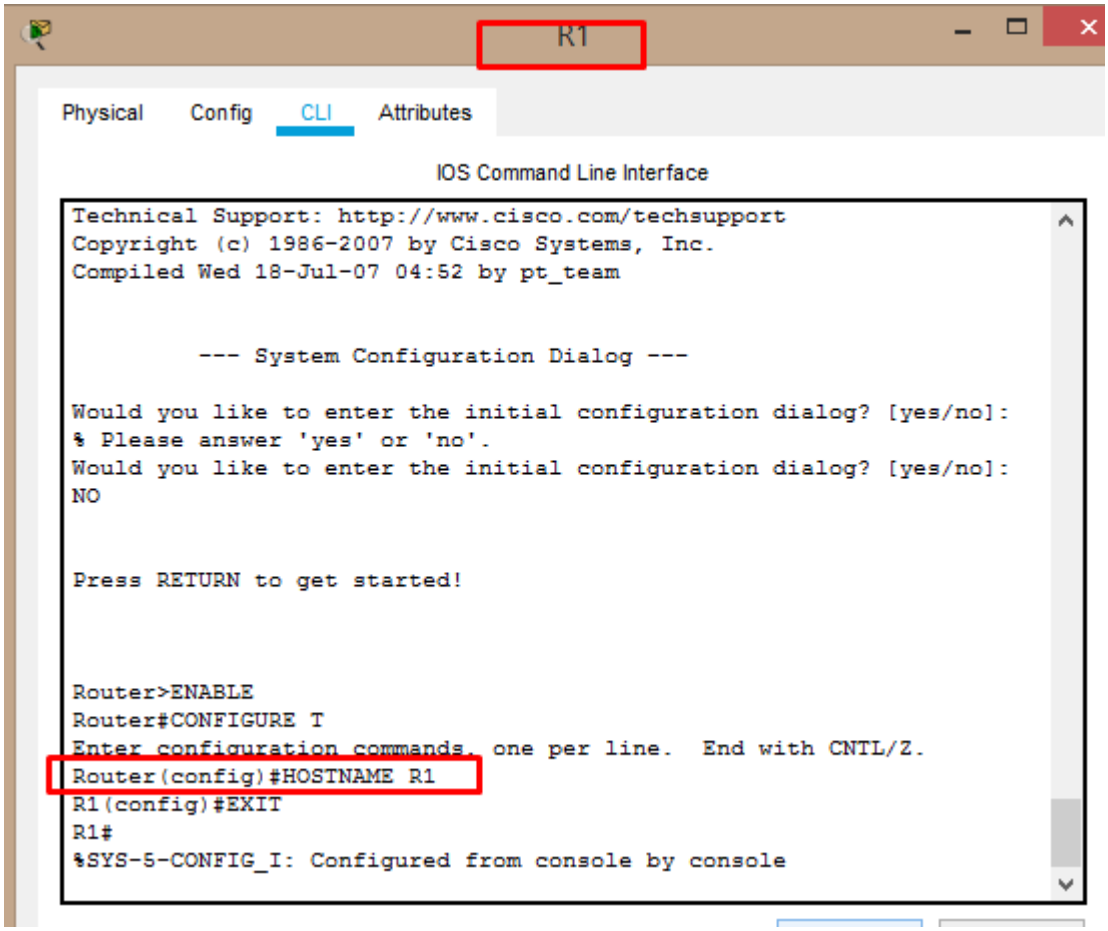
Escenario 1

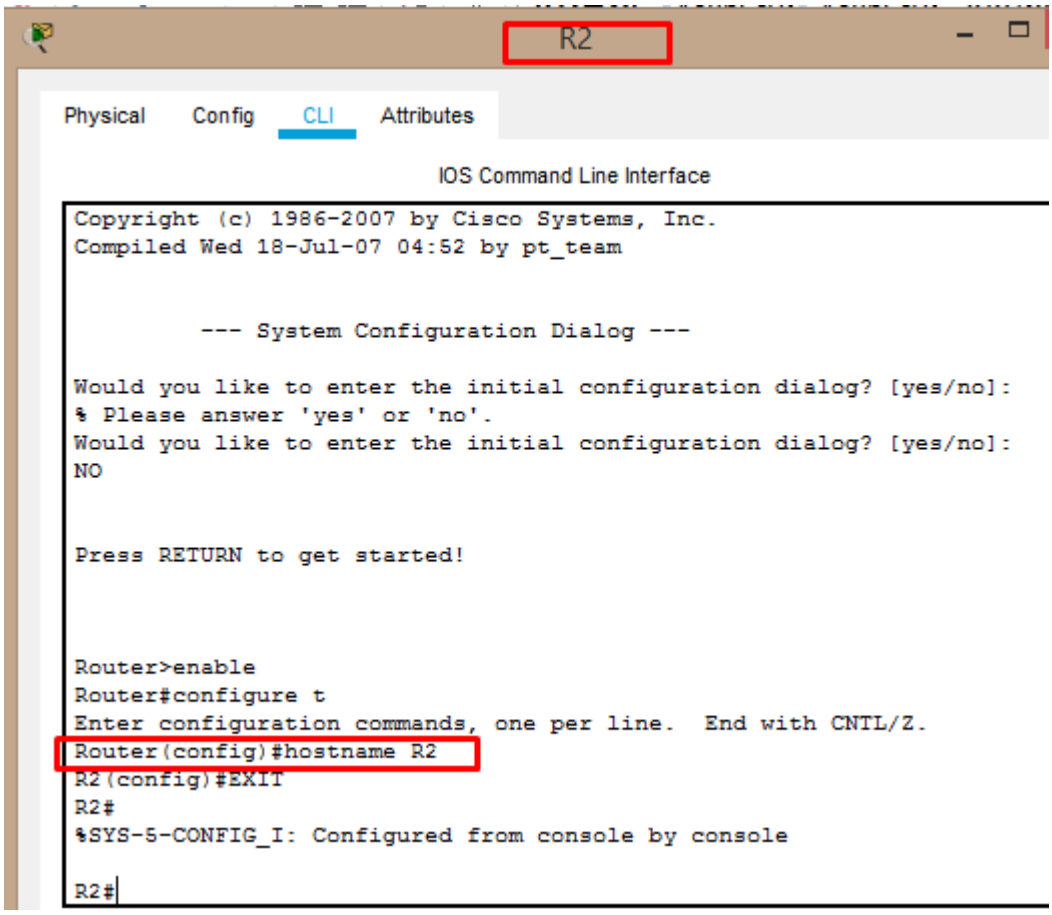

Physical
[Root]
01:56:30
ISP
R1
R2
R3
SW2
SW3
PC0
PC1
Laptop0
Laptop1
PC 31
PC 30
Laptop 31
Laptop 30
Server0
Realtime
Simulation
Serial DTE
12:35 a. m.
12/12/2018


SW 2
Physical
Config
CLI
Attributes
IOS Command Line Interface
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/12, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/13, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/13, changed state to up
%LINK-3-UPDOWN: Interface FastEthernet0/13, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/13, changed state to down
Switch>
Switch>enable
Switch#configure t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname SW2
SW2(config)#exit
SW2#
%SYS-5-CONFIG_I: Configured from console by console
SW2#


SW 3
Physical
Config
CLI
Attributes
IOS Command Line Interface
%LINK-5-CHANGED: Interface FastEthernet0/13, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/13, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/14, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/14, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/15, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/15, changed state to up
Switch>enable
Switch#configure t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname SW3
SW3(config)#EXIT
SW3#
%SYS-5-CONFIG_I: Configured from console by console


ISP
Physical
Config
CLI
Attributes
IOS Command Line Interface
Press RETURN to get started.
Router>ENABLE
Router#CONFIGURE T
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname ISP
ISP(config)#EXIT
ISP#
%SYS-5-CONFIG_I: Configured from console by console


R1
Physical
Config
CLI
Attributes
IOS Command Line Interface
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2007 by Cisco Systems, Inc.
Compiled Wed 18-Jul-07 04:52 by pt_team
--- System Configuration Dialog ---
Would you like to enter the initial configuration dialog? [yes/no]:
% Please answer 'yes' or 'no'.
Would you like to enter the initial configuration dialog? [yes/no]:
NO
Press RETURN to get started!
Router>ENABLE
Router#CONFIGURE T
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#HOSTNAME R1
R1(config)#EXIT
R1#
%SYS-5-CONFIG_I: Configured from console by console


R2
Physical
Config
CLI
Attributes
IOS Command Line Interface
Copyright (c) 1986-2007 by Cisco Systems, Inc.
Compiled Wed 18-Jul-07 04:52 by pt_team
--- System Configuration Dialog ---
Would you like to enter the initial configuration dialog? [yes/no]:
% Please answer 'yes' or 'no'.
Would you like to enter the initial configuration dialog? [yes/no]:
NO
Press RETURN to get started!
Router>enable
Router#configure t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname R2
R2(config)#EXIT
R2#
%SYS-5-CONFIG_I: Configured from console by console
R2#

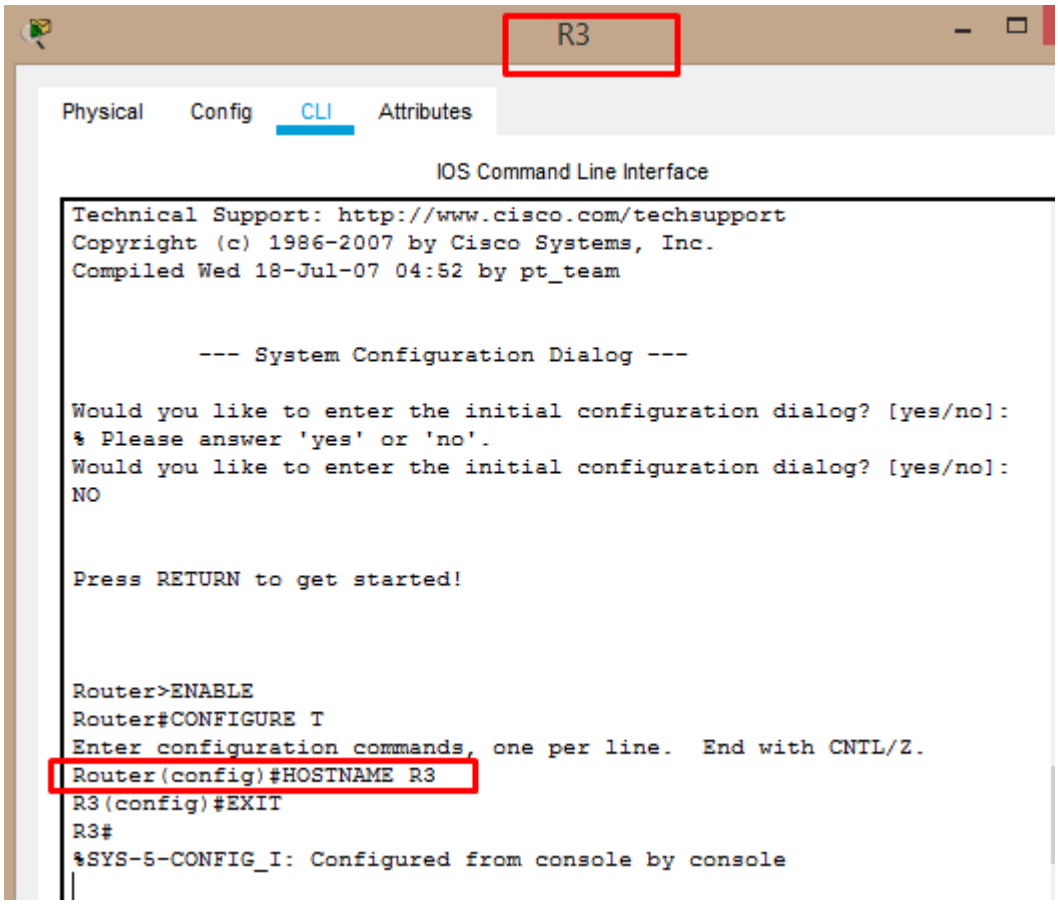

R3
Physical
Config
CLI
Attributes
IOS Command Line Interface
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2007 by Cisco Systems, Inc.
Compiled Wed 18-Jul-07 04:52 by pt_team
--- System Configuration Dialog ---
Would you like to enter the initial configuration dialog? [yes/no]:
% Please answer 'yes' or 'no'.
Would you like to enter the initial configuration dialog? [yes/no]:
NO
Press RETURN to get started!
Router>ENABLE
Router#CONFIGURE T
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#HOSTNAME R3
R3(config)#EXIT
R3#
%SYS-5-CONFIG_I: Configured from console by console

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.

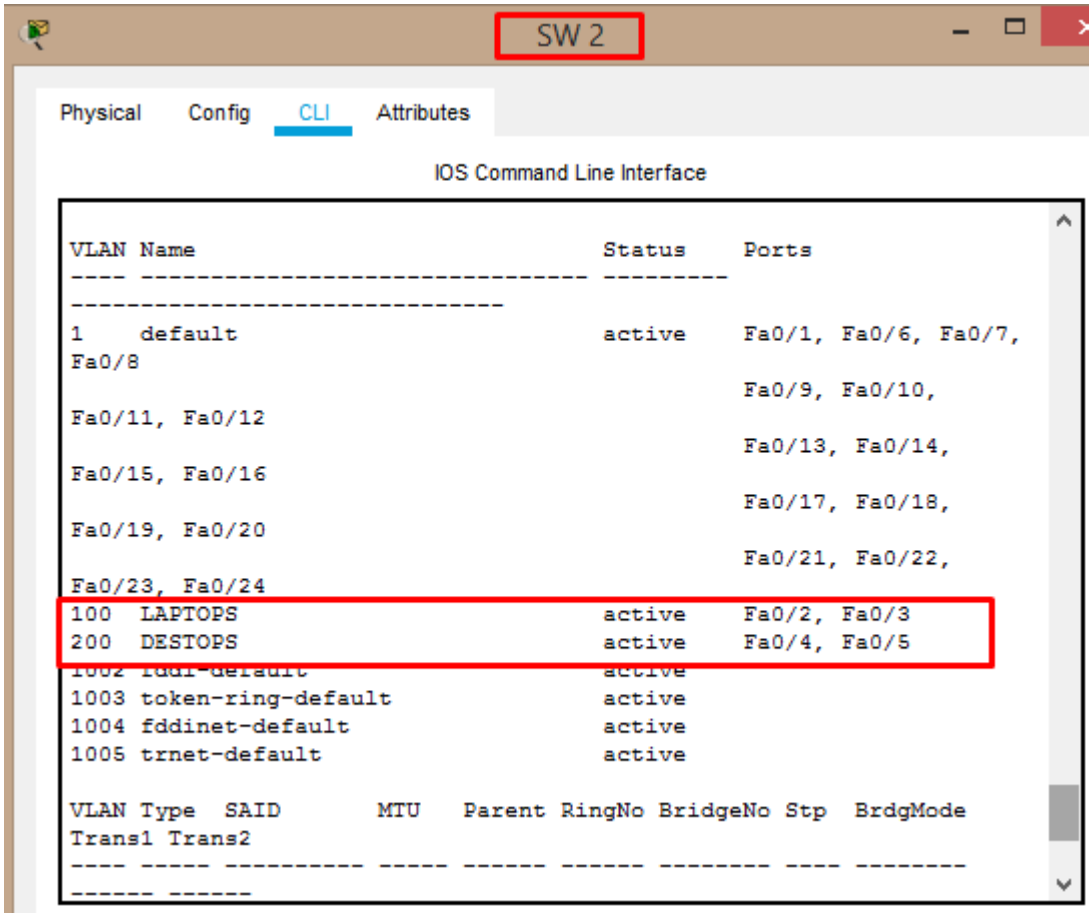
Descripción de las actividades

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

```
SW2>enable
SW2#configure t
Enter configuration commands, one per line. End with CNTL/Z.
SW2(config)#vlan 100
SW2(config-vlan)#name LAPTOPS
SW2(config-vlan)#vlan 200
SW2(config-vlan)#name DESTOPS
SW2(config-vlan)#exit
SW2(config)#int range fa0/2-3

SW2(config-if-range)#switchport access vlan 100
SW2(config-if-range)#int range fa0/4-5
SW2(config-if-range)#switchport access vlan 200
SW2(config-if-range)#
```

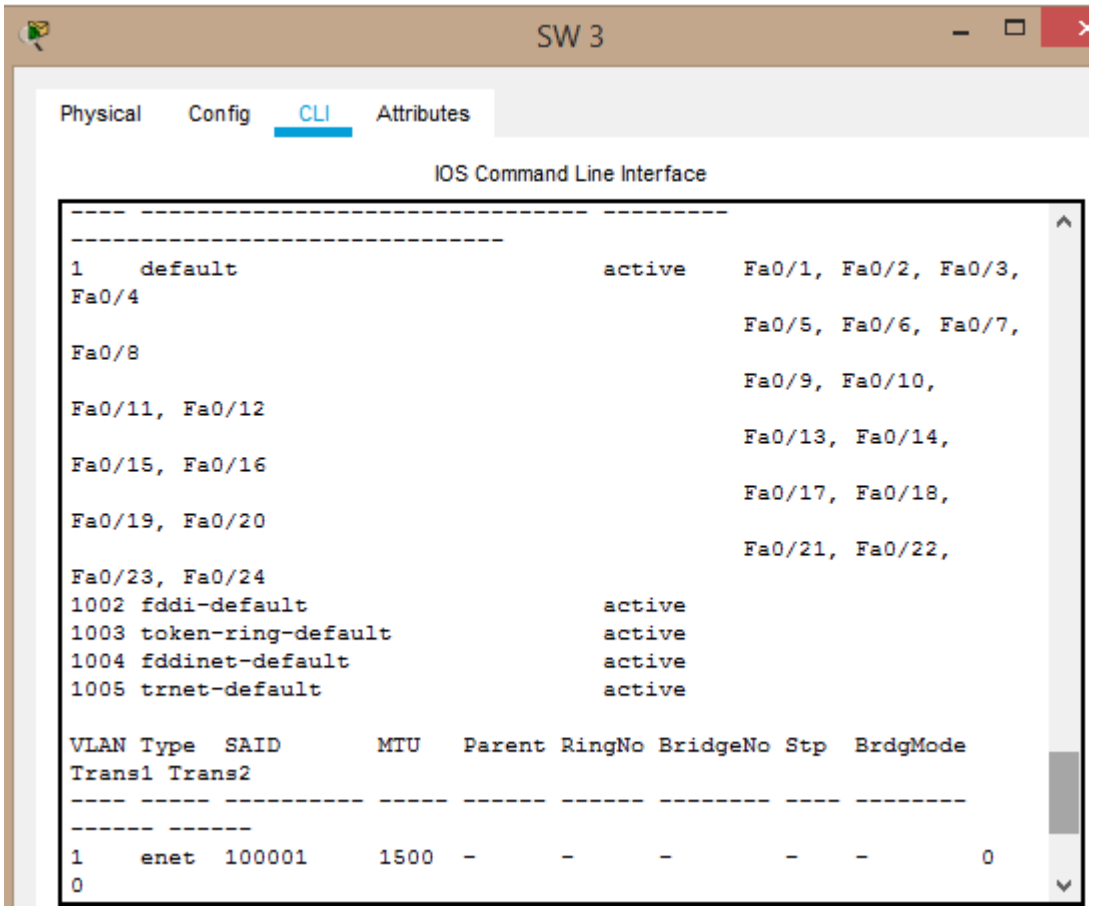
SW2(config-if-range)#int fa0/9
SW2(config-if)#
SW2(config-if)#switchport mode trunk
SW2(config-if)#int range fa0/6-24

SW2(config-if-range)#shutdon



SW3>enable
SW3#configure t
Enter configuration commands, one per line. End with CNTL/Z.
SW3(config)#vlan 1
SW3(config-if-range)#switchport access

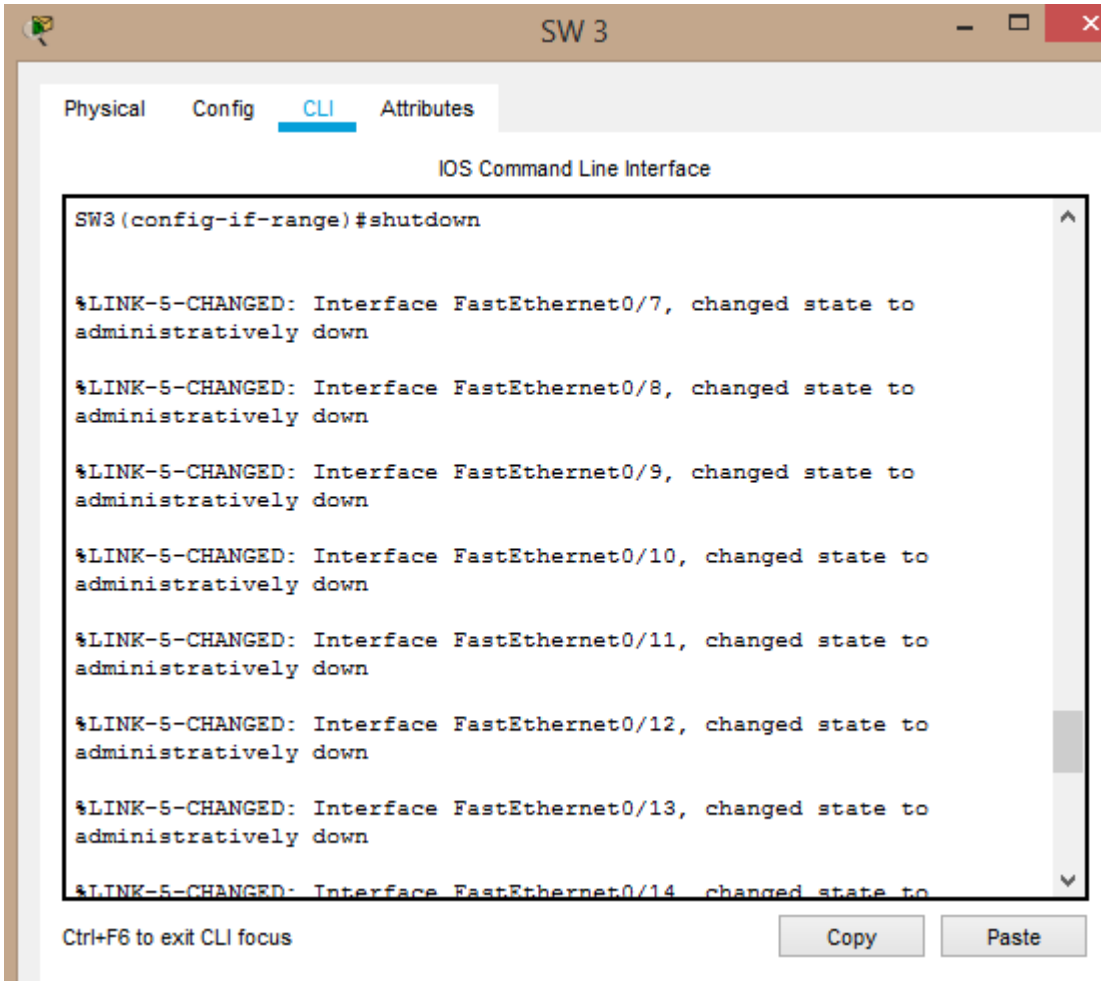
SW3(config-if-range)#switchport access vlan 1
SW3(config-if-range)#
SW3#



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

SW3(config)#int range fa0/6-23
SW3(config-if-range)#shutdown

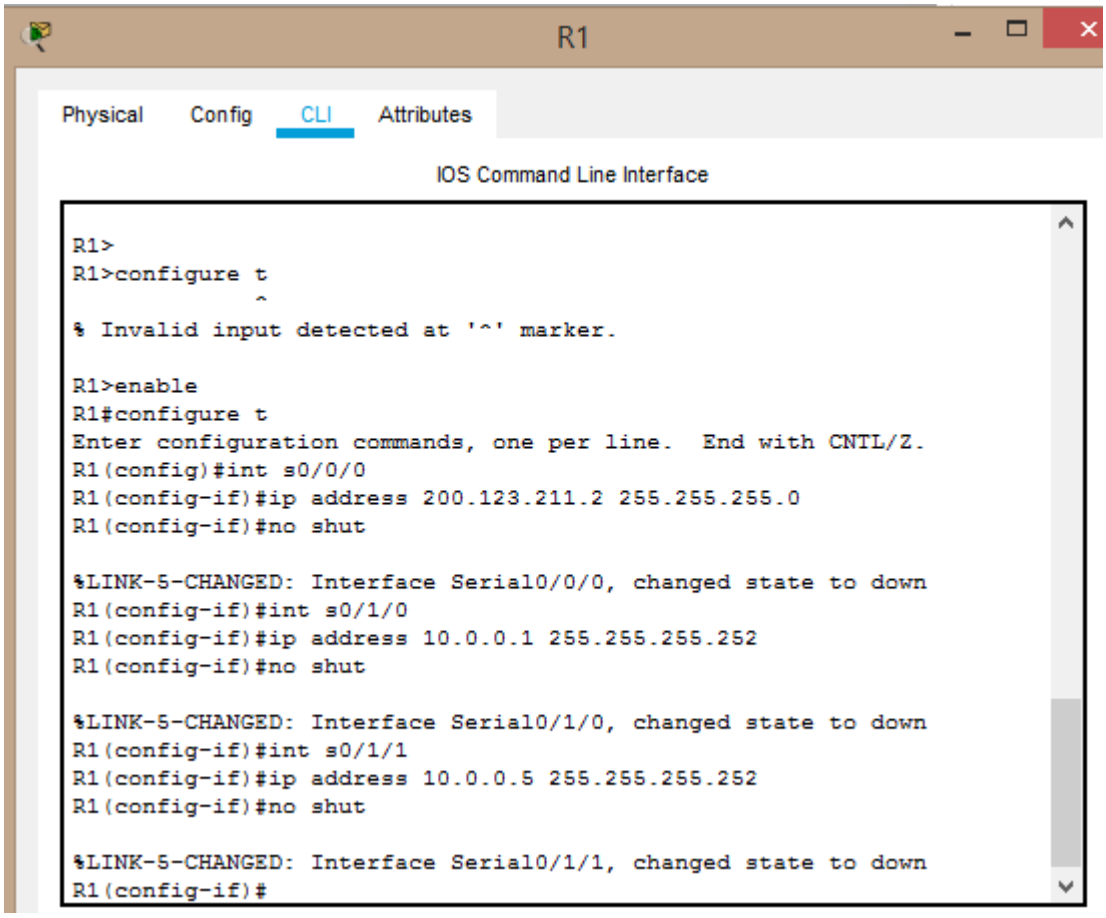
SW2(config)#int range fa0/6-24
SW2(config-if-range)#shutdown


SW 3
Physical
Config
CLI
Attributes
IOS Command Line Interface
SW3(config-if-range)#shutdown
%LINK-5-CHANGED: Interface FastEthernet0/7, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/8, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/9, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/10, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/11, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/12, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/13, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/14, changed state to
Ctrl+F6 to exit CLI focus
Copy
Paste

```
%LINK-5-CHANGED: Interface FastEthernet0/13, changed state to
administratively down

%LINK-5-CHANGED: Interface FastEthernet0/14, changed state to
administratively down

%LINK-5-CHANGED: Interface FastEthernet0/15, changed state to
administratively down

%LINK-5-CHANGED: Interface FastEthernet0/16, changed state to
administratively down

%LINK-5-CHANGED: Interface FastEthernet0/17, changed state to
administratively down

%LINK-5-CHANGED: Interface FastEthernet0/18, changed state to
administratively down

%LINK-5-CHANGED: Interface FastEthernet0/19, changed state to
administratively down

%LINK-5-CHANGED: Interface FastEthernet0/20, changed state to
administratively down

%LINK-5-CHANGED: Interface FastEthernet0/23, changed state to
administratively down
SW3(config-if-range)#
%LINK-5-CHANGED: Interface FastEthernet0/6, changed state to
administratively down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/6,
changed state to down
```

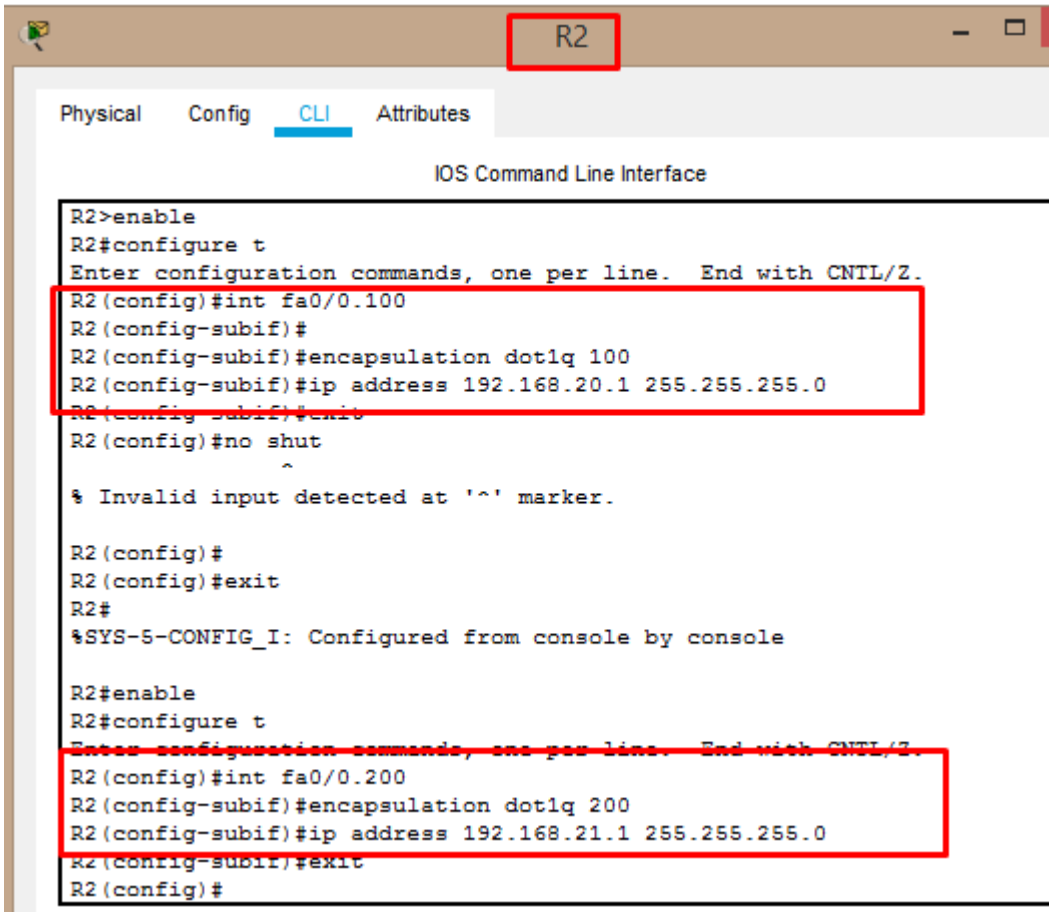
- La información de dirección IP R1, R2 y R3 debe cumplir con la tabla 1.

```
R1>enable
R1#configure t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#int s0/0/0
R1(config-if)#ip address 200.123.211.2 255.255.255.0
R1(config-if)#exit
R1(config)#int s0/1/0
R1(config-if)#ip address 10.0.0.1 255.255.255.252
R1(config-if)#exit
R1(config)#int s0/1/1
R1(config-if)#ip address 10.0.0.5 255.255.255.252
R1(config-if)#exit
```

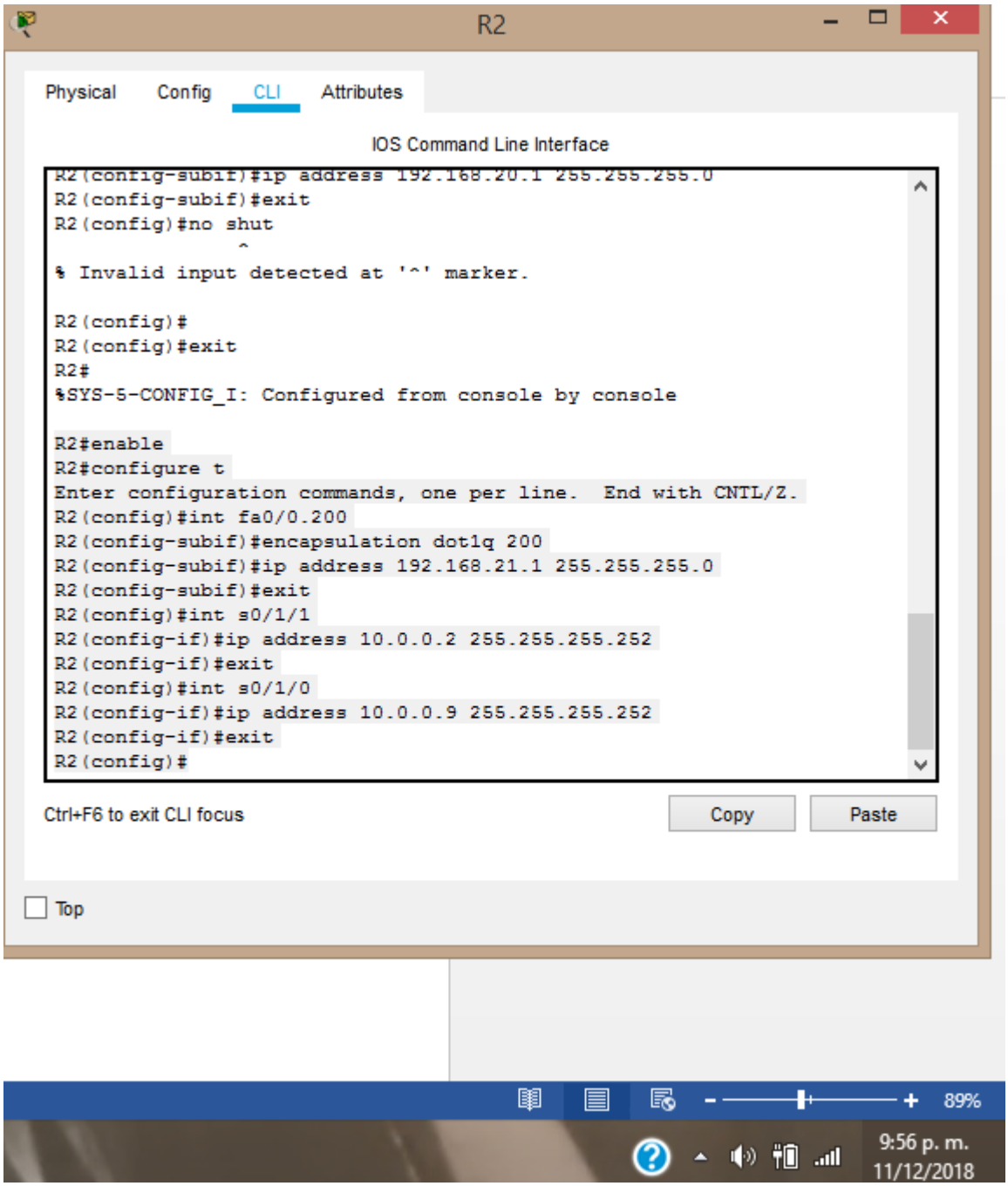


R2>
R2>enable
R2#configure t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#int fa0/0.100
R2(config-subif)#
R2(config-subif)#encapsulation dot1q 100
R2(config-subif)#ip address 192.168.20.1 255.255.255.0

R2(config)#int 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

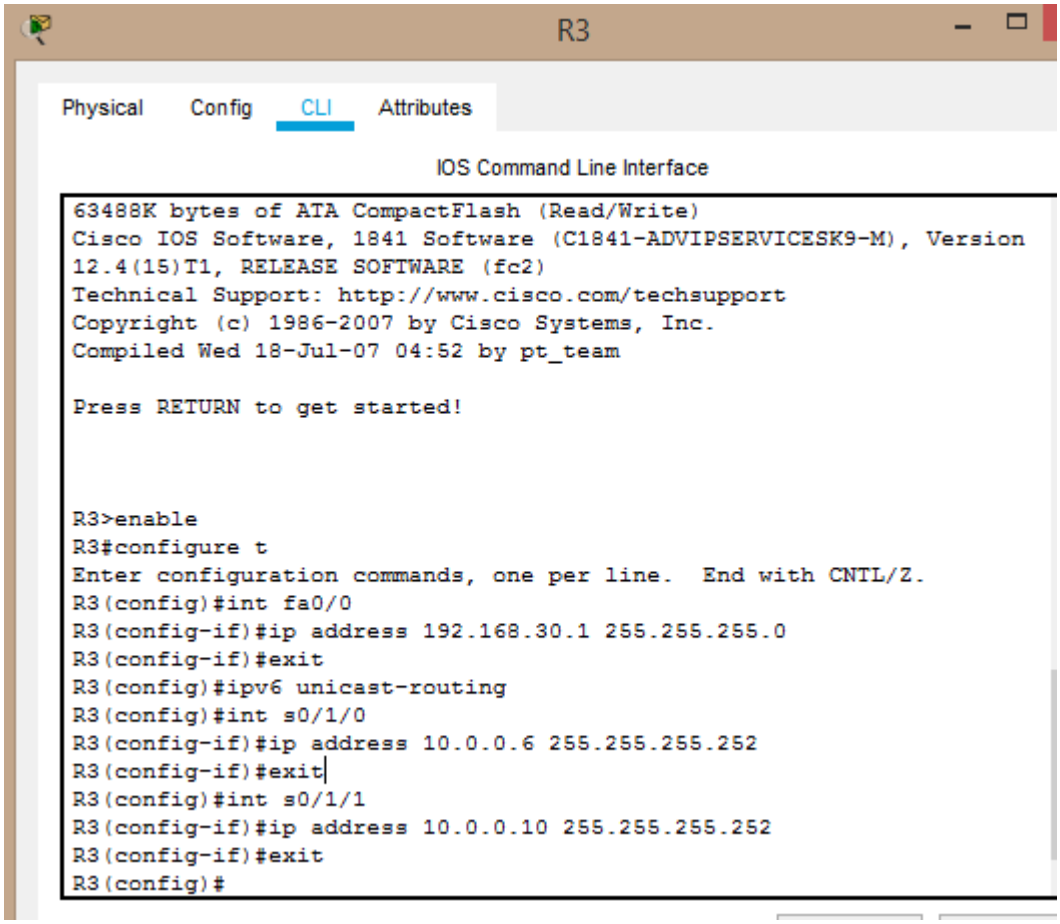


R2#enable
R2#configure t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#int fa0/0.200
R2(config-subif)#encapsulation dot1q 200
R2(config-subif)#ip address 192.168.21.1 255.255.255.0
R2(config-subif)#exit
R2(config)#int s0/1/1
R2(config-if)#ip address 10.0.0.2 255.255.255.252
R2(config-if)#exit
R2(config)#int s0/1/0
R2(config-if)#ip address 10.0.0.9 255.255.255.252
R2(config-if)#exit
R2(config)#

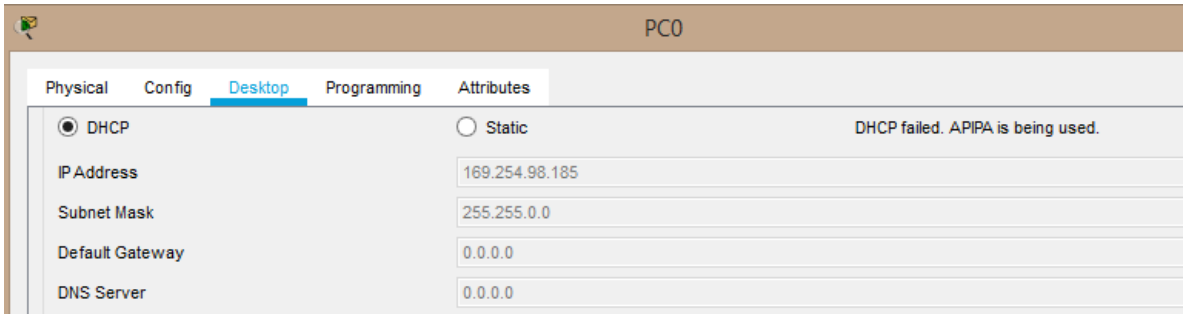


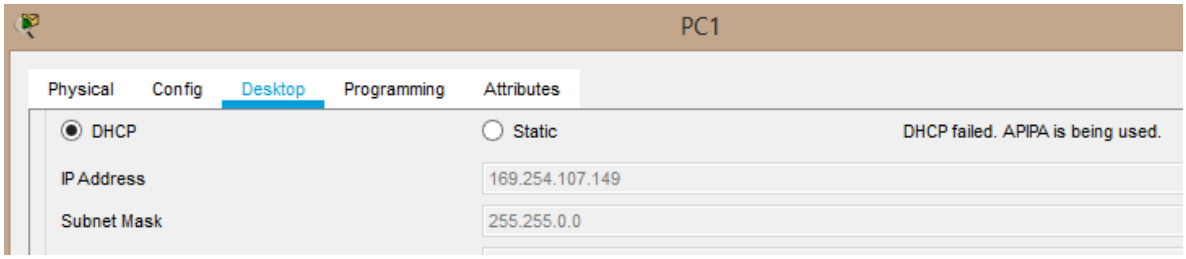
R3>enable
R3#configure t
Enter configuration commands, one per line. End with CNTL/Z.
R3(config)#int fa0/0

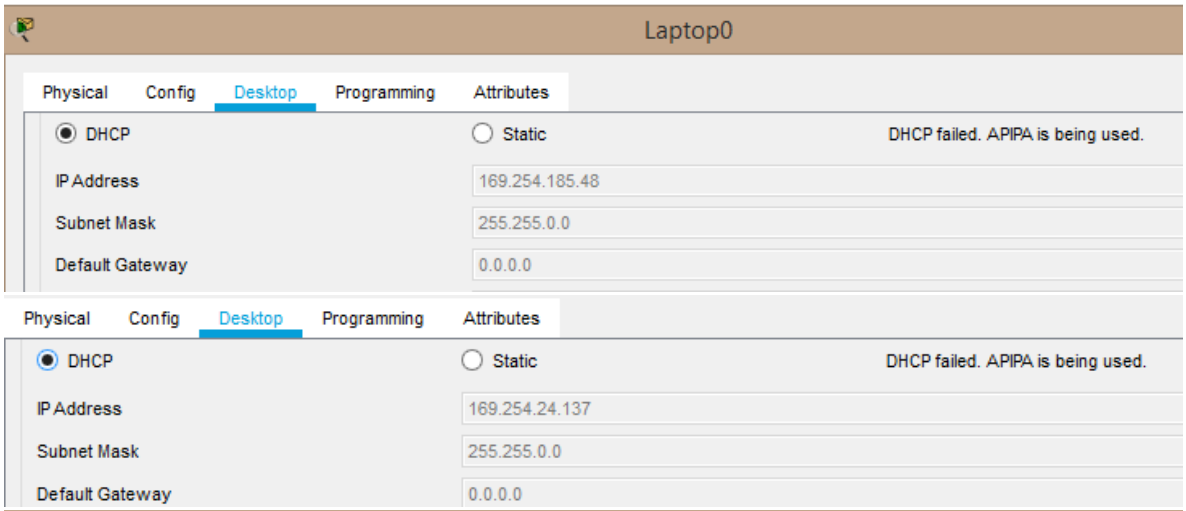
```
R3(config-if)#ip address 192.168.30.1 255.255.255.0
R3(config-if)#exit
R3(config)#ipv6 unicast-routing
R3(config)#int s0/1/0
R3(config-if)#ip address 10.0.0.6 255.255.255.252
R3(config-if)#exit
R3(config)#int s0/1/1
R3(config-if)#ip address 10.0.0.10 255.255.255.252
R3(config-if)#exit
R3(config)#
```

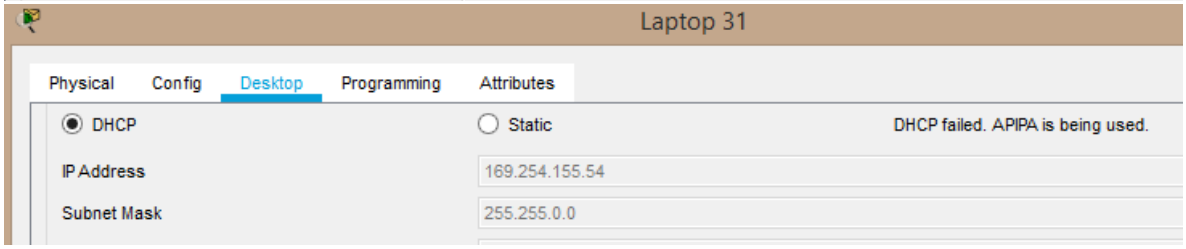


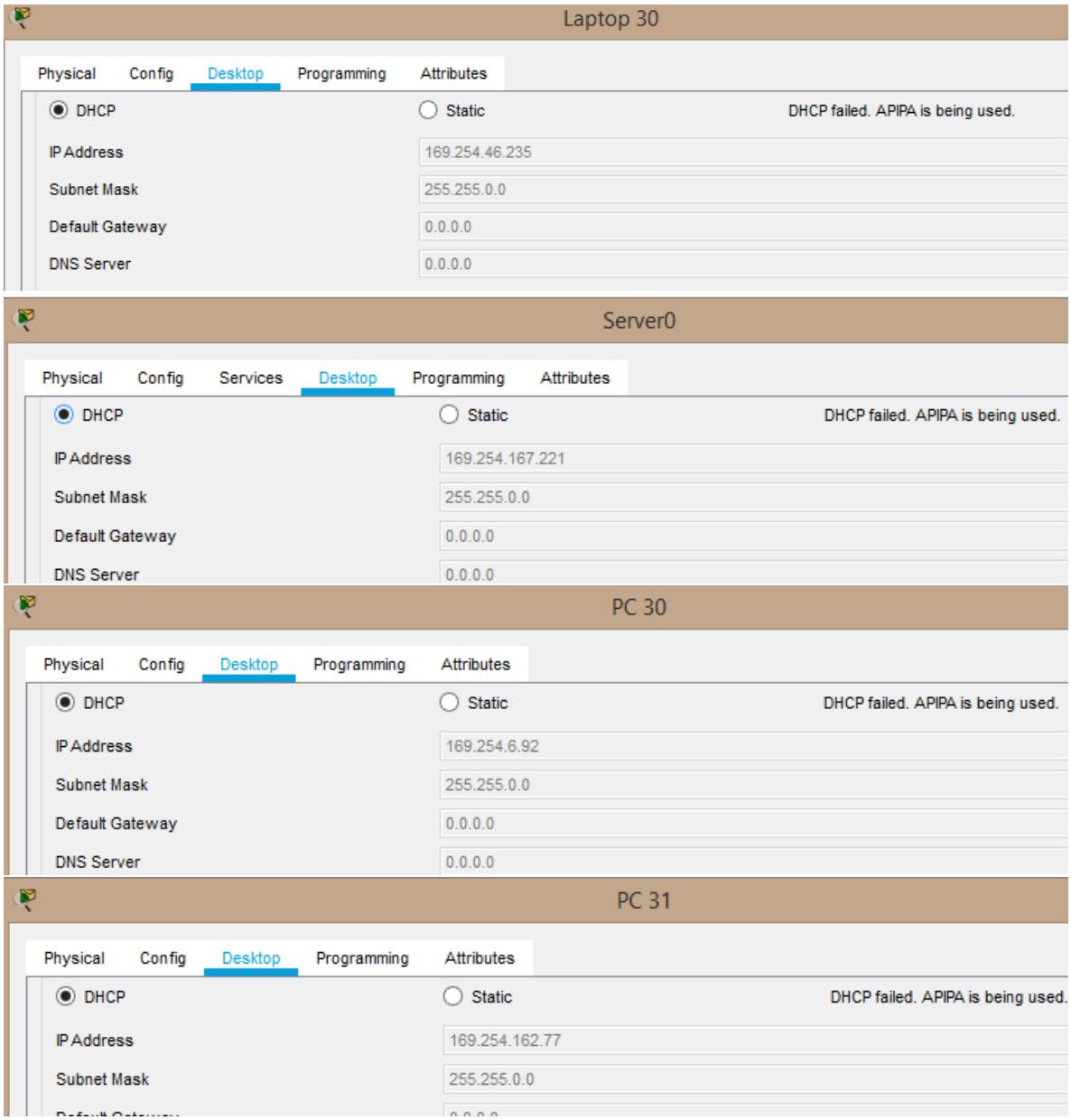
- Laptop20, Laptop21, PC20, PC21, Laptop30, Laptop31, PC30 y PC31 deben obtener información IPv4 del servidor DHCP.


PC0
Physical
Config
Desktop
Programming
Attributes
DHCP
Static
DHCP failed. APIPA is being used.
IP Address
169.254.98.185
Subnet Mask
255.255.0.0
Default Gateway
0.0.0.0
DNS Server
0.0.0.0


PC1
Physical
Config
Desktop
Programming
Attributes
DHCP
Static
DHCP failed. APIPA is being used.
IP Address
169.254.107.149
Subnet Mask
255.255.0.0


Laptop0
Physical
Config
Desktop
Programming
Attributes
DHCP
Static
DHCP failed. APIPA is being used.
IP Address
169.254.185.48
Subnet Mask
255.255.0.0
Default Gateway
0.0.0.0
Physical
Config
Desktop
Programming
Attributes
DHCP
Static
DHCP failed. APIPA is being used.
IP Address
169.254.24.137
Subnet Mask
255.255.0.0
Default Gateway
0.0.0.0


Laptop 31
Physical
Config
Desktop
Programming
Attributes
DHCP
Static
DHCP failed. APIPA is being used.
IP Address
169.254.155.54
Subnet Mask
255.255.0.0



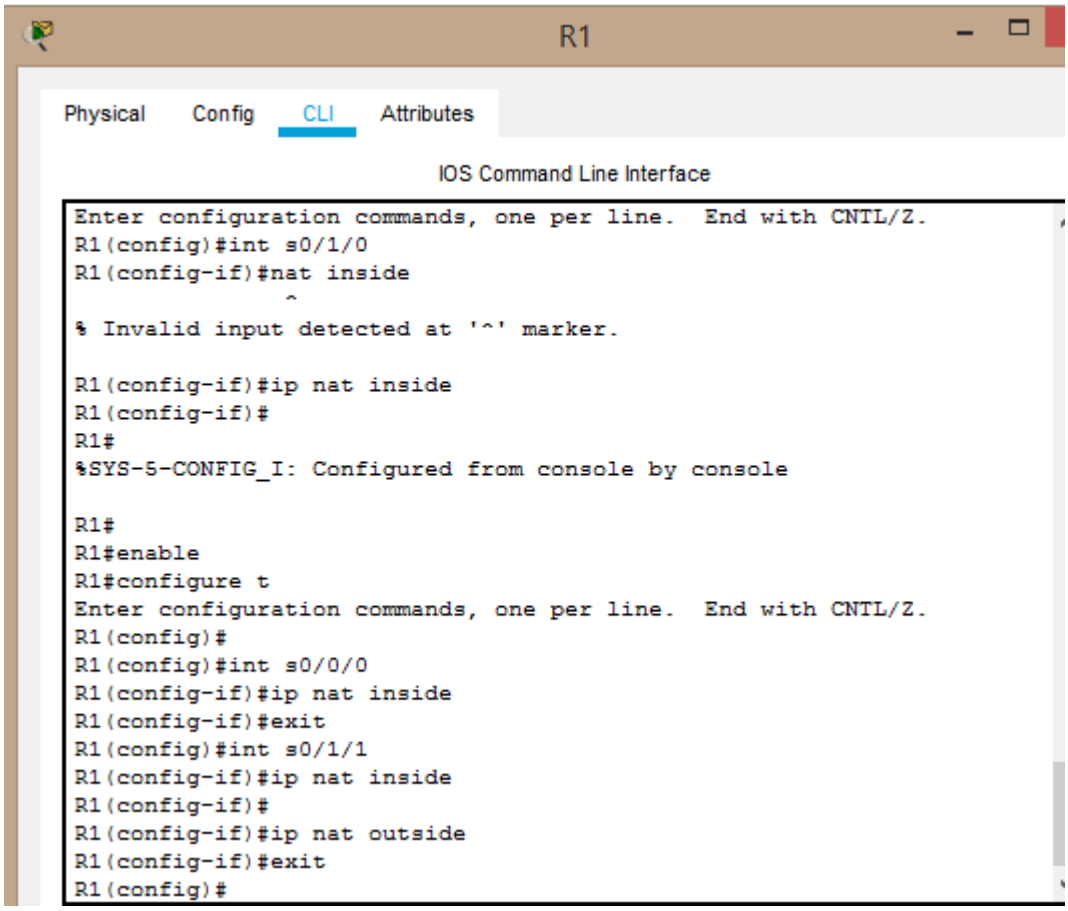
- R1 debe realizar una NAT con sobrecarga sobre una dirección IPv4 pública. Asegúrese de que todos los terminales pueden comunicarse con Internet pública (haga ping a la dirección ISP) y la lista de acceso estándar se llama INSIDE-DEVS.

```
R1>enable
R1#configure t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#int s0/1/0
```

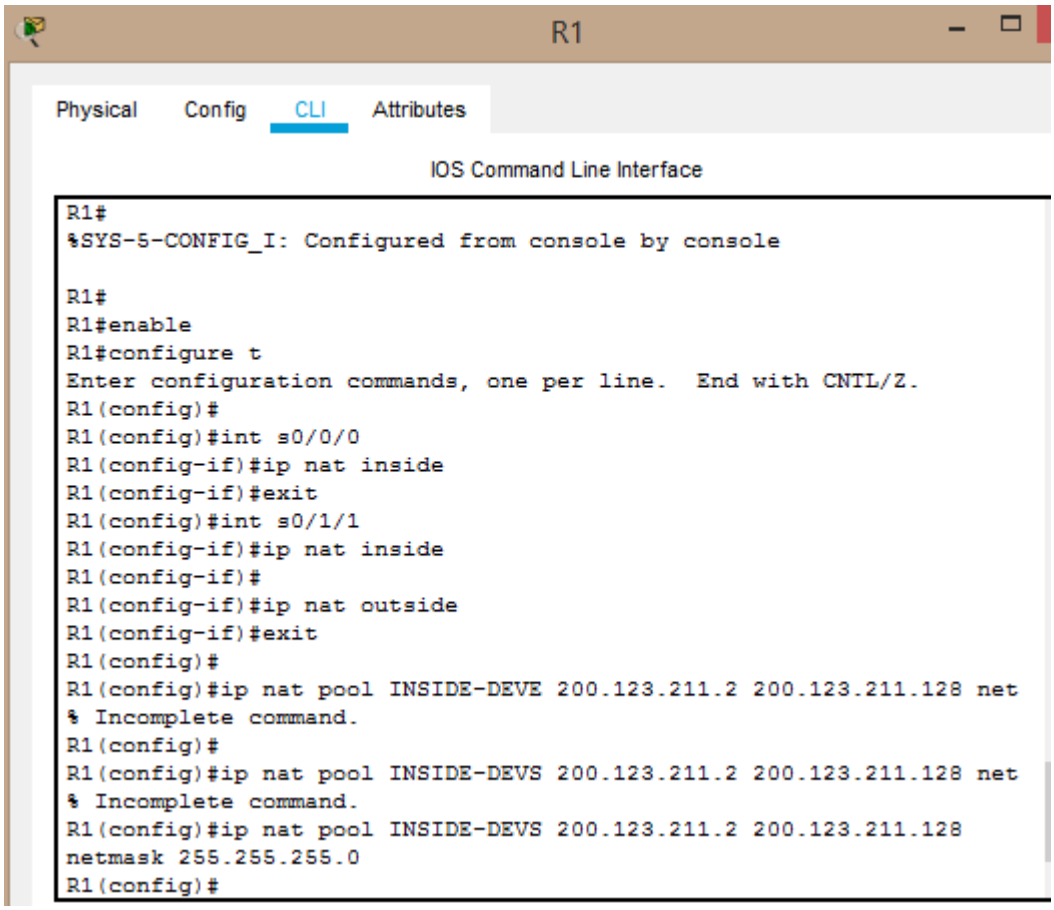
R1(config-if)#ip nat inside

R1(config)#int s0/0/0
R1(config-if)#ip nat inside
R1(config-if)#exit

R1#enable
R1#configure t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#
R1(config)#int s0/0/0
R1(config-if)#ip nat inside
R1(config-if)#exit
R1(config)#int s0/1/1
R1(config-if)#ip nat inside
R1(config-if)#
R1(config-if)#ip nat outside
R1(config-if)#exit
R1(config)#



R1(config)#ip nat pool INSIDE-DEVS 200.123.211.2 200.123.211.128 netmask 255.255.255.0



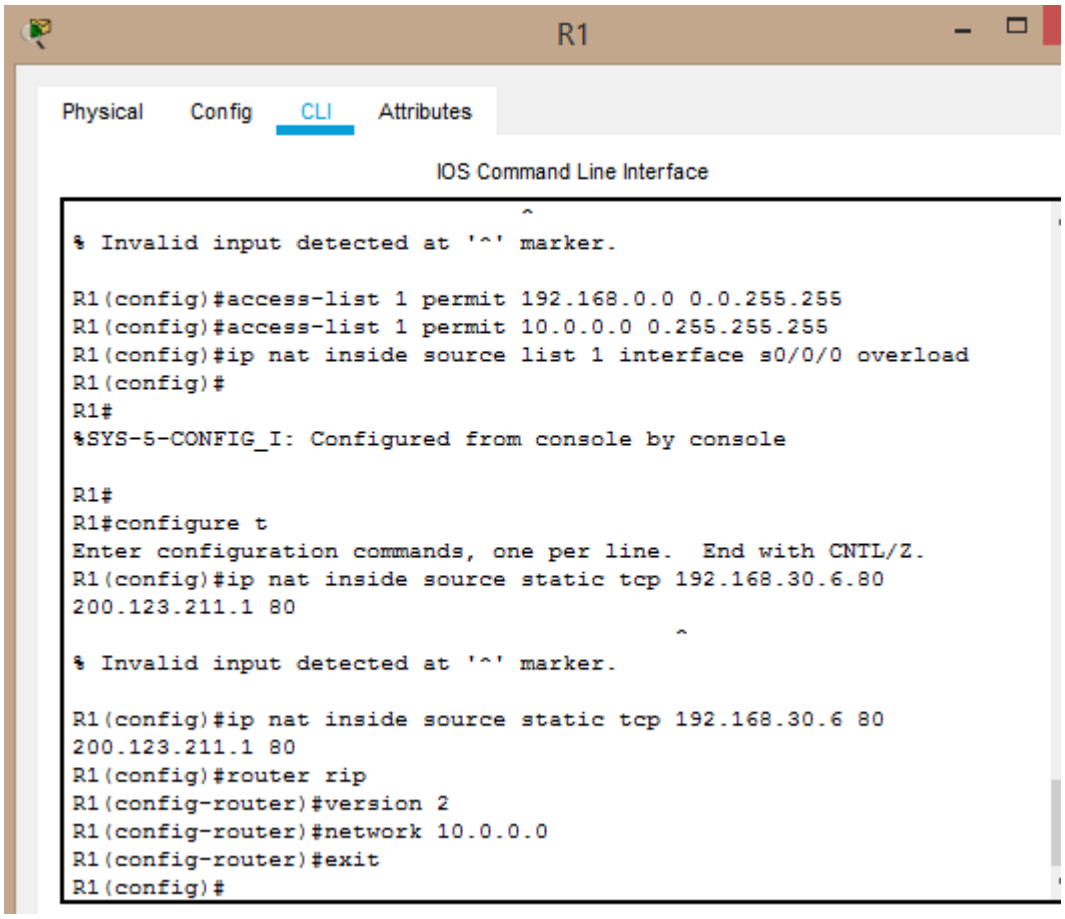
R1(config)#access-list 1 permit 192.168.0.0 0.0.255.255
R1(config)#access-list 1 permit 10.0.0.0 0.255.255.255

R1(config)#ip nat inside source list 1 interface s0/0/0 overload

R1(config)#ip nat inside source static tcp 192.168.30.6 80 200.123.211.1 80

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

R1(config)#router rip
R1(config-router)#version 2
R1(config-router)#network 10.0.0.0




```
R1#show ip nat translations
Pro  Inside global     Inside local       Outside local      Outside
global
tcp 200.123.211.1:80   192.168.30.6:80    ---                ---

R1#
```

```
R1#show ip nat statistics
Total translations: 1 (1 static, 0 dynamic, 1 extended)
Outside Interfaces: Serial0/1/1
Inside Interfaces: Serial0/0/0 , Serial0/1/0
Hits: 0  Misses: 0
Expired translations: 0
Dynamic mappings:
R1#
```

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

R2(config)#ip dhcp excluded-address 10.0.0.2 10.0.0.9
R2(config)#ip dhcp pool INSIDE-DEVS
R2(dhcp-config)#NETwork 192.168.20.1 255.255.255.0
R2(dhcp-config)#NETwork 192.168.21.1 255.255.255.0
R2(dhcp-config)#default-router 192.168.1.1
R2(dhcp-config)#dns-server 0.0.0.0
R2(dhcp-config)#exit

```
R2>enable
R2#configure t
Enter configuration commands, one per line.  End with CNTL/Z.
R2(config)#ip dhcp excluded-address 10.0.0.2 10.0.
                                             ^
% Invalid input detected at '^' marker.

R2(config)#ip dhcp excluded-address 10.0.0.2 10.0.0.9
R2(config)#ip dhcp pool INSIDE-DEVS
R2(dhcp-config)#NETwork 192.168.20.1 255.255.255.0
R2(dhcp-config)#NETwork 192.168.21.1 255.255.255.0
R2(dhcp-config)#default-router 192.168.1.1
R2(dhcp-config)#dns-server 0.0.0.0
R2(dhcp-config)#exit
R2(config)#
```

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

R2(config)#int vlan 100
R2(config-if)#ip address 192.168.20.1 255.255.255.0

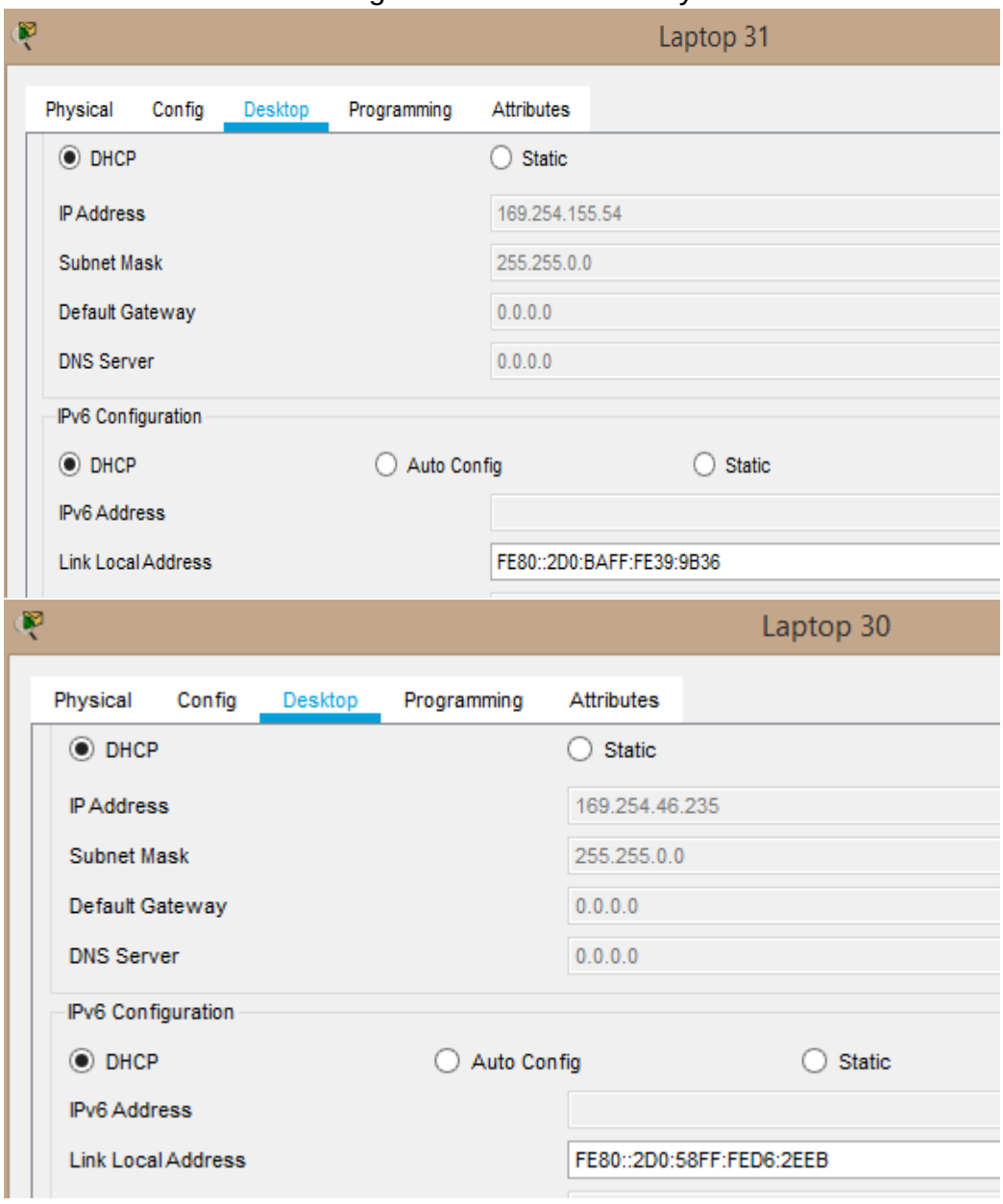
```
R2(config)#int vlan 100
R2(config-if)#ip address 192.168.20.1 255.255.255.0
% 192.168.20.0 overlaps with FastEthernet0/0.100
R2(config-if)#exit
R2(config)#
```

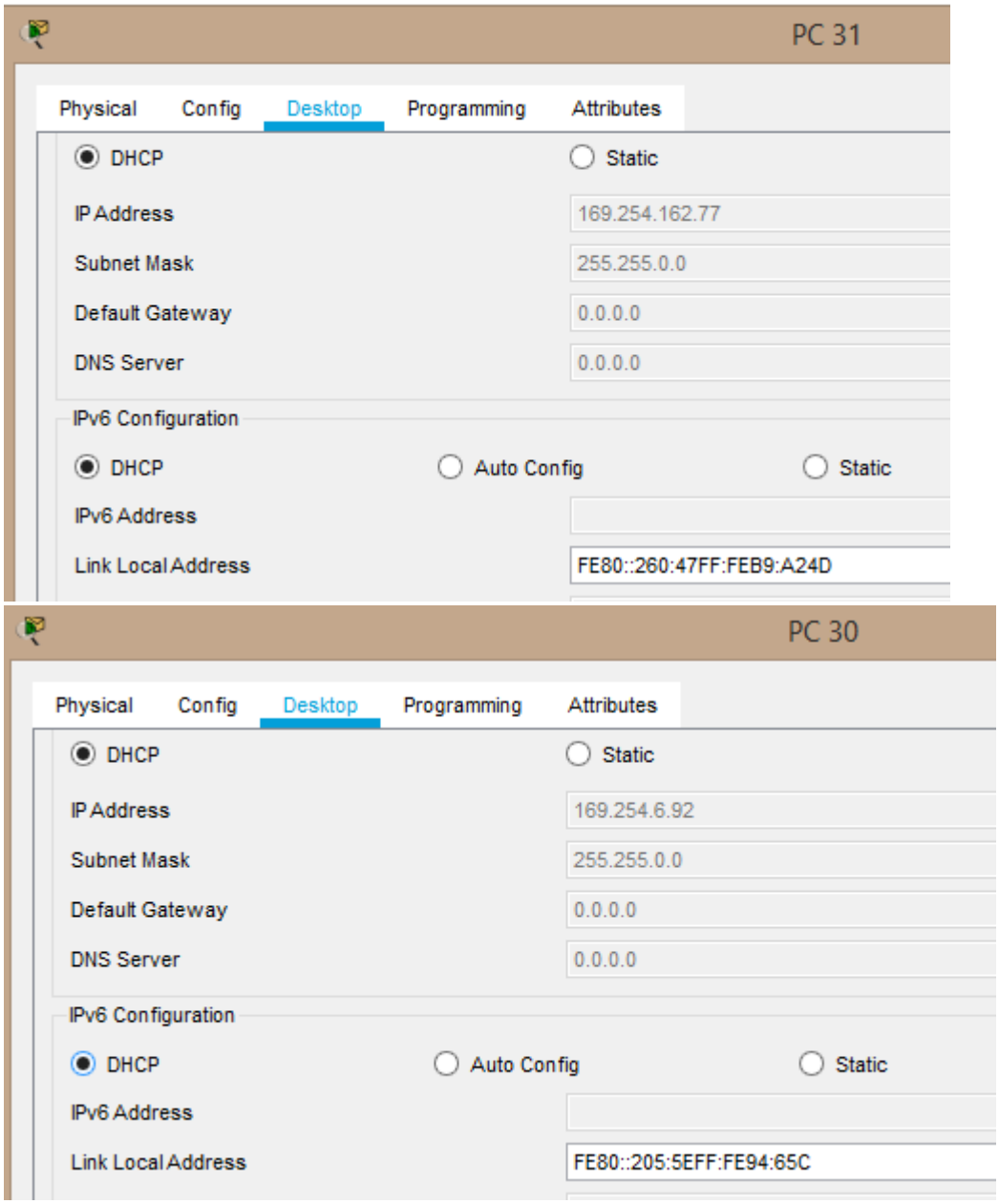
R2(config)#int vlan 200
R2(config-if)#ip address 192.168.21.1 255.255.255.0

```
R2(config-if)#ip address 192.168.21.1 255.255.255.0
% 192.168.21.0 overlaps with FastEthernet0/0.200
R2(config-if)#
```

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

- 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.

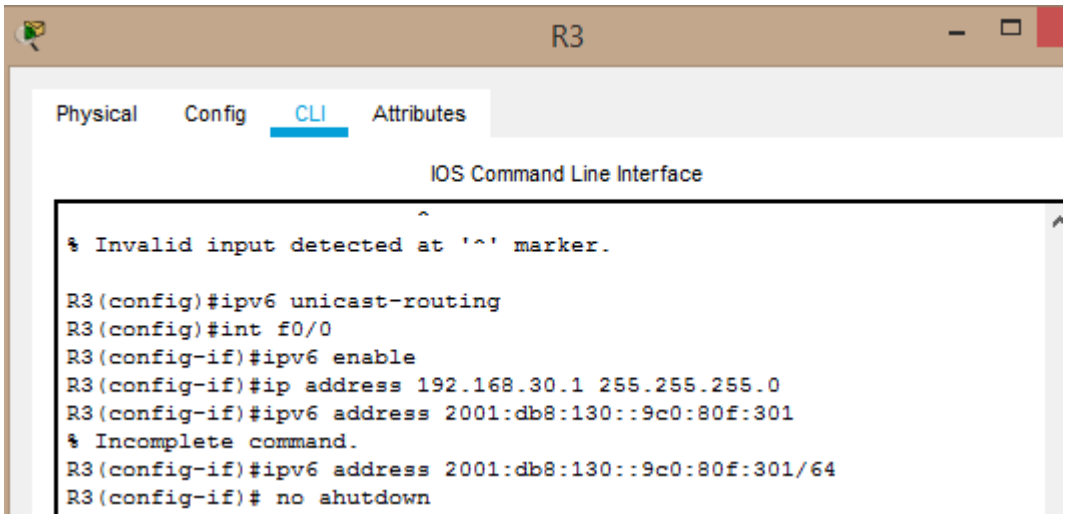




- La interfaz FastEthernet 0/0 del R3 también deben tener direcciones IPv4 e IPv6 configuradas (dual- stack).

```
R3>enable
R3#configure t
R3(config)#ipv6 unicast-routing
R3(config)#int f0/0
R3(config-if)#ipv6 enable
R3(config-if)#ip address 192.168.30.1 255.255.255.0
```

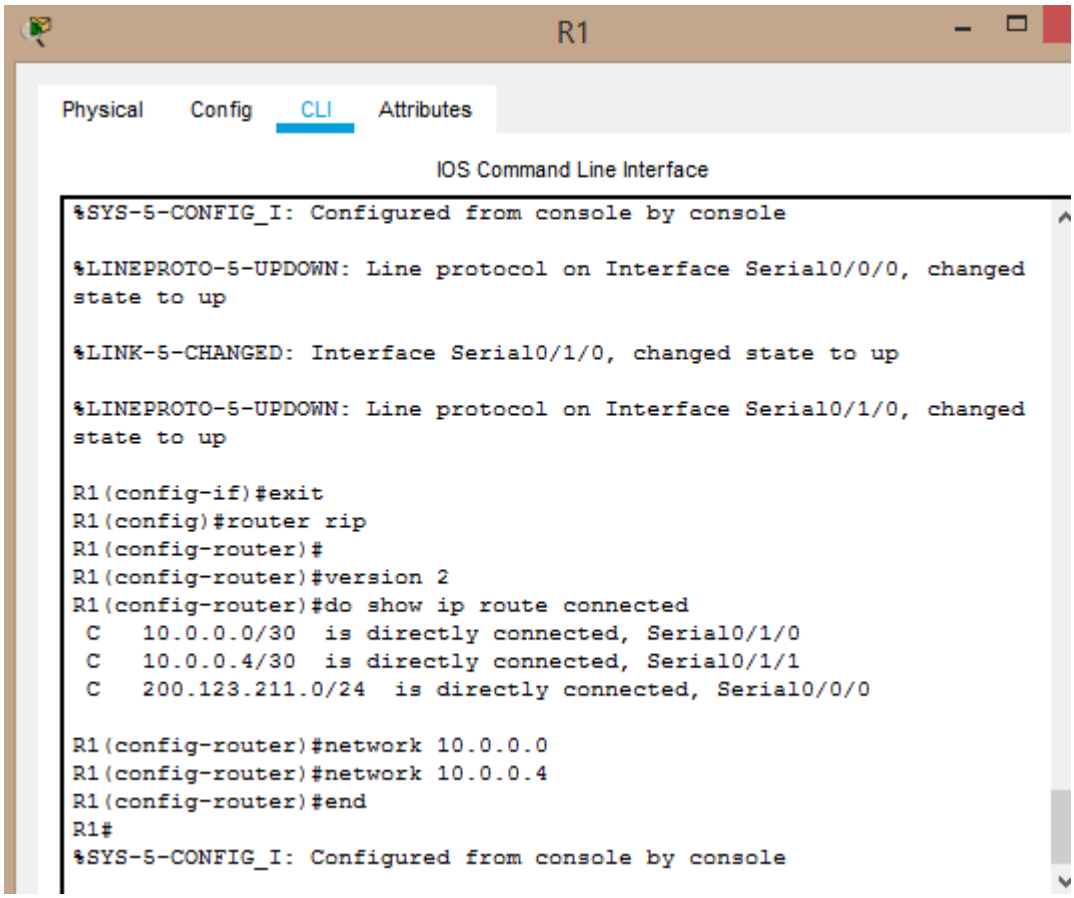
R3(config-if)#ipv6 address 2001:db8:130::9c0:80f:301/64



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

  R1(config)#router rip
  R1(config-router)#version 2
  R1(config-router)#do show ip route connected

  R1(config-router)#network 10.0.0.0
  R1(config-router)#network 10.0.0.4



R2(config-if)#
R2(config-if)#router rip
R2(config-router)#version 2
R2(config-router)#do show ip route connected

```
C   10.0.0.0/30  is directly connected, Serial0/1/1
C   10.0.0.8/30  is directly connected, Serial0/1/0
C   192.168.20.0/24  is directly connected, FastEthernet0/0.100
C   192.168.21.0/24  is directly connected, FastEthernet0/0.200
```

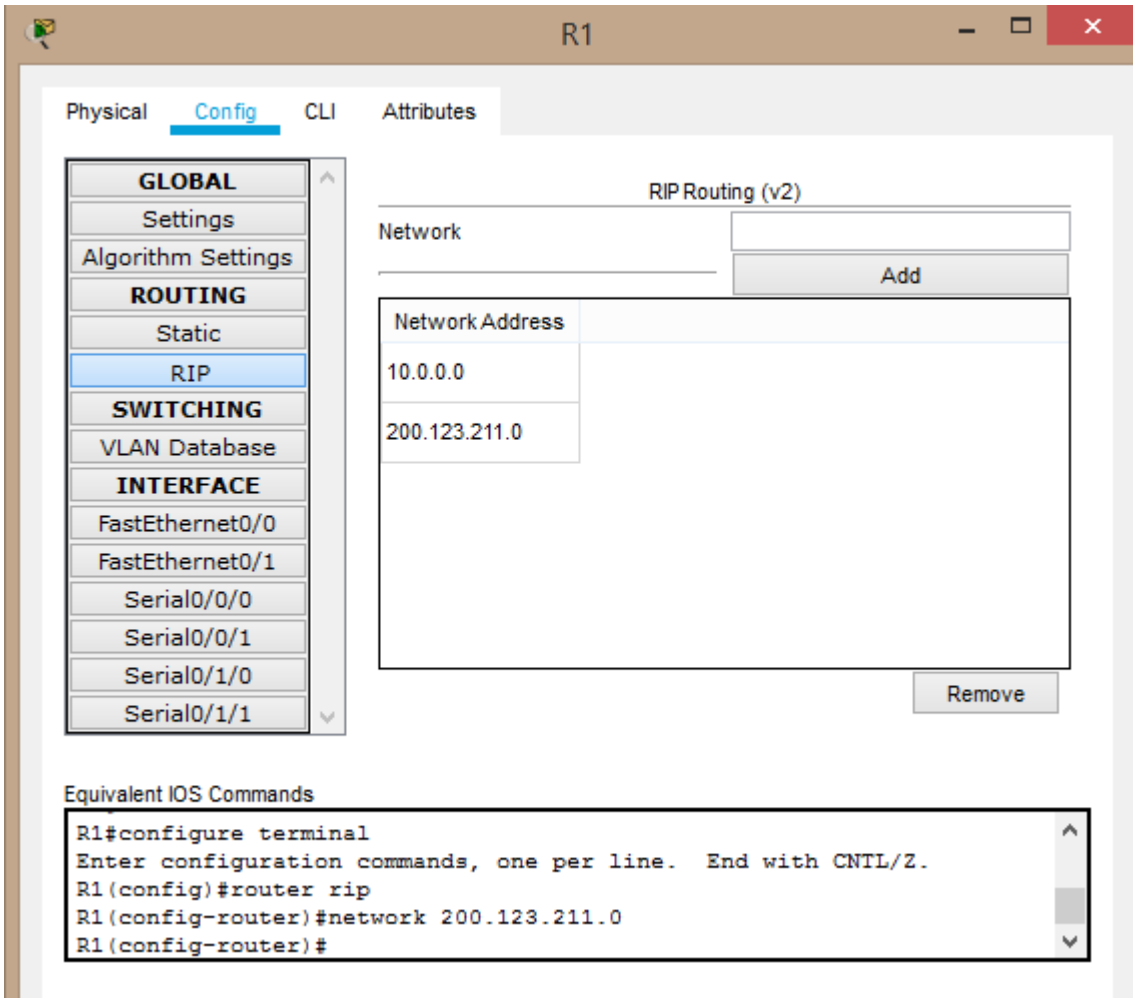
R2(config-router)#network 10.0.0.0
R2(config-router)#network 10.0.0.8

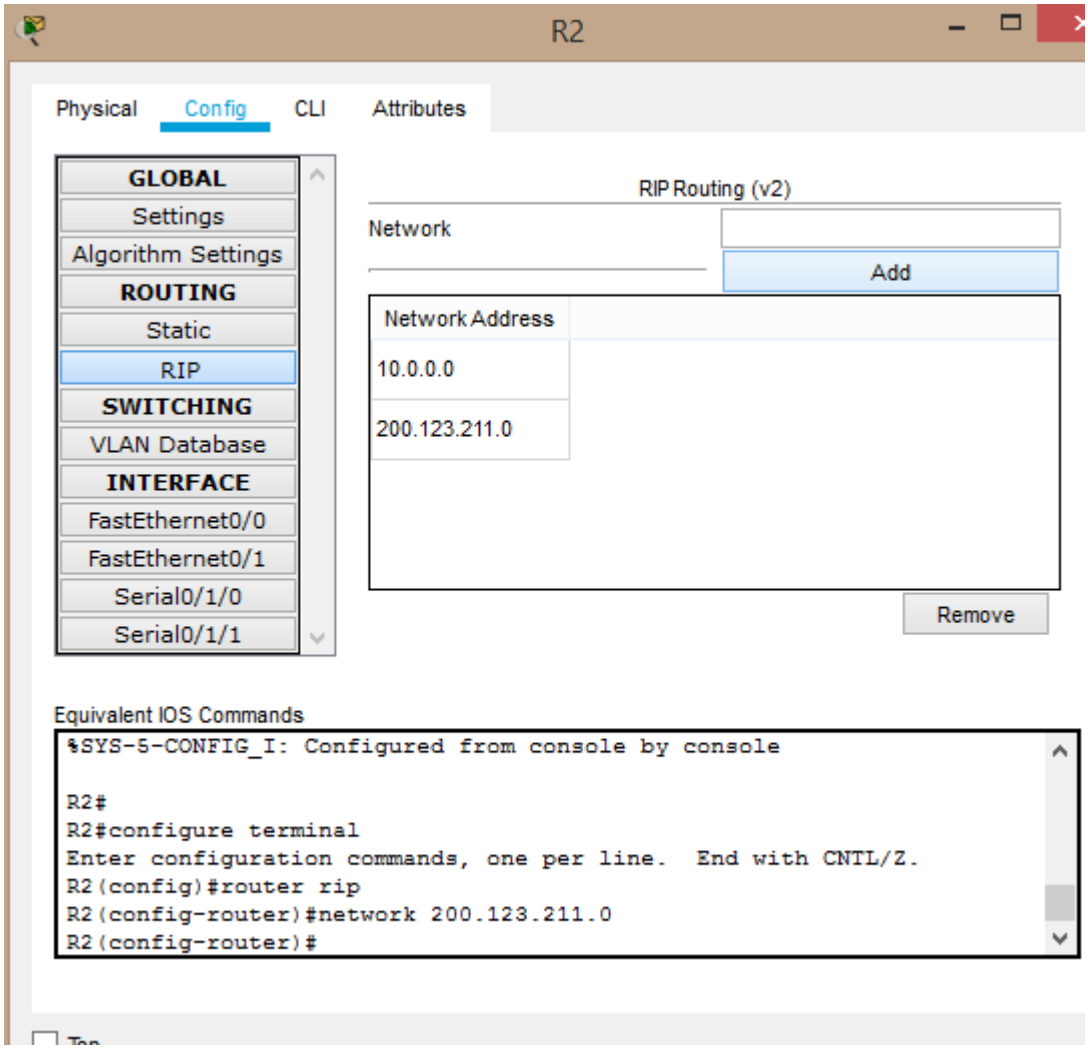
R3(config)#router rip
R3(config-router)#version 2

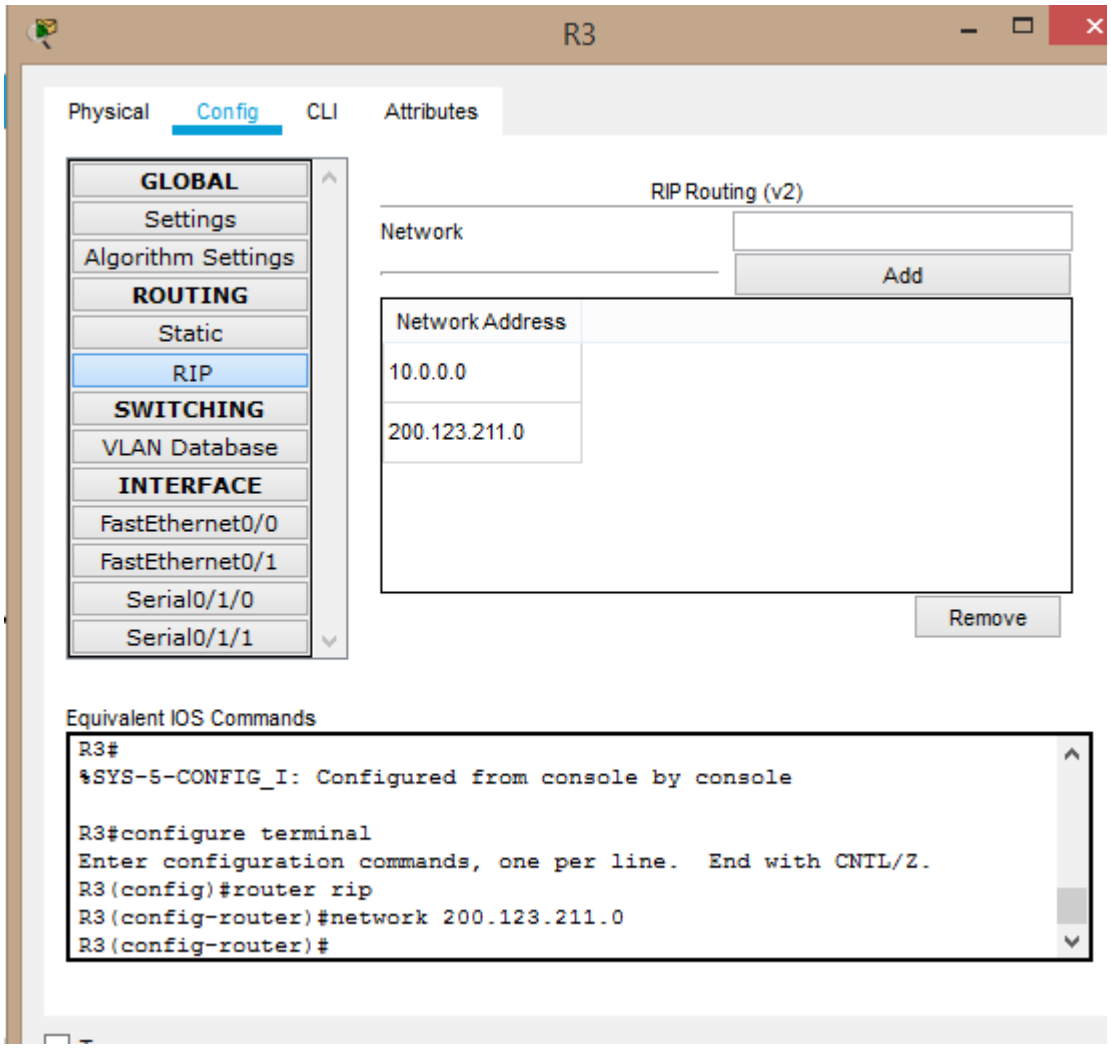
R3(config-router)#network 10.0.0.4
R3(config-router)#network 10.0.0.8

```
R3>enable
R3#configure t
Enter configuration commands, one per line.  End with CNTL/Z.
R3(config)#router rip
R3(config-router)#version 2
R3(config-router)#do show ip route connected
 C   10.0.0.4/30  is directly connected, Serial0/1/0
 C   10.0.0.8/30  is directly connected, Serial0/1/1
 C   192.168.30.0/24  is directly connected, FastEthernet0/0

R3(config-router)#network 10.0.0.4
R3(config-router)#network 10.0.0.8
R3(config-router)#end
R3#
%SYS-5-CONFIG_I: Configured from console by console
```

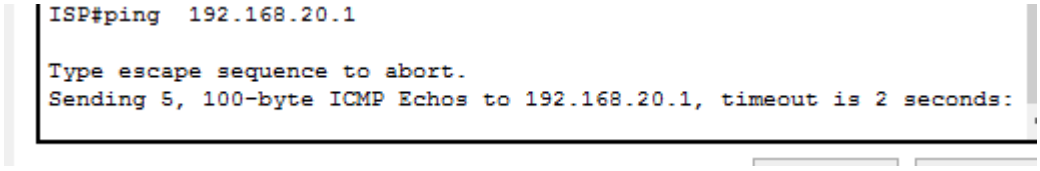
- R1, R2 y R3 deben saber sobre las rutas de cada uno y la ruta predeterminada desde R1.


R1
Physical
Config
CLI
Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
FastEthernet0/0
FastEthernet0/1
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
R1#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#router rip
R1(config-router)#network 200.123.211.0
R1(config-router)#


R2
Physical
Config
CLI
Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
FastEthernet0/0
FastEthernet0/1
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
%SYS-5-CONFIG_I: Configured from console by console
R2#
R2#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#router rip
R2(config-router)#network 200.123.211.0
R2(config-router)#



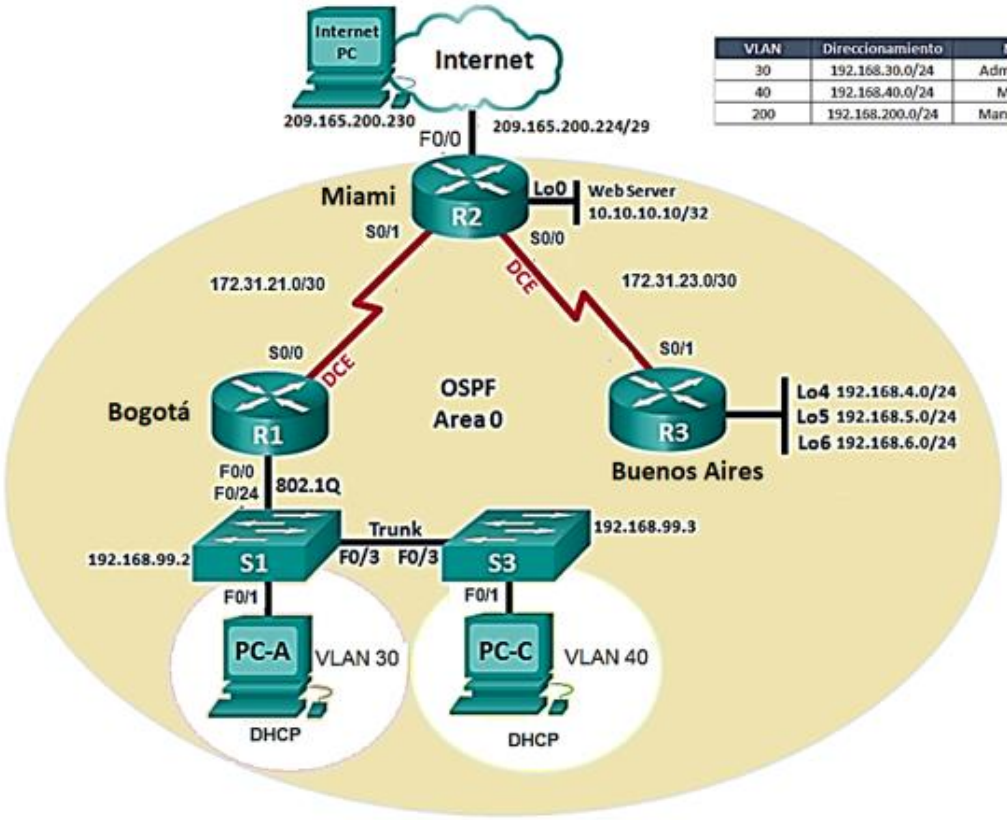
- Verifique la conectividad. Todos los terminales deben poder hacer ping entre sí y a la dirección IP del ISP. Los terminales bajo el R3 deberían poder hacer IPv6-ping entre ellos y el servidor.



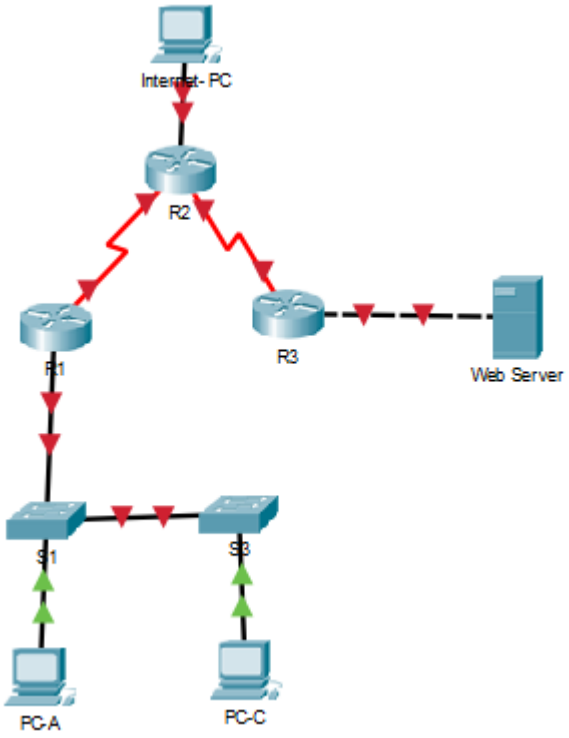
Escenario 2

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.

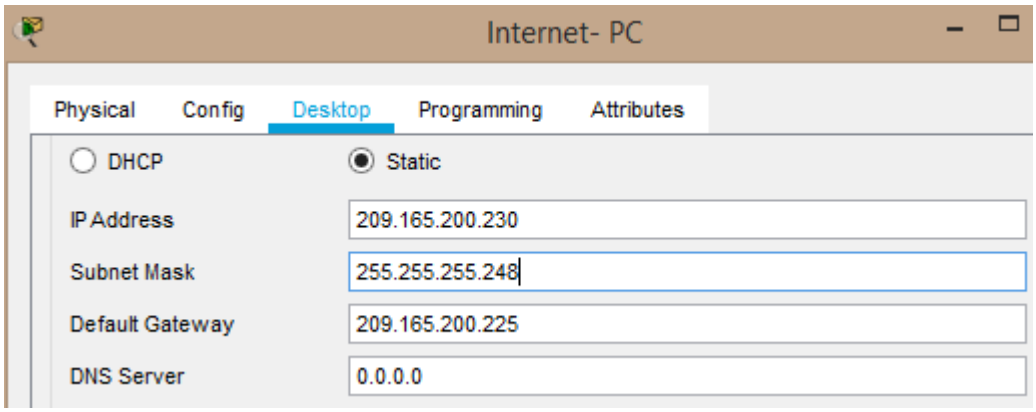
Topología

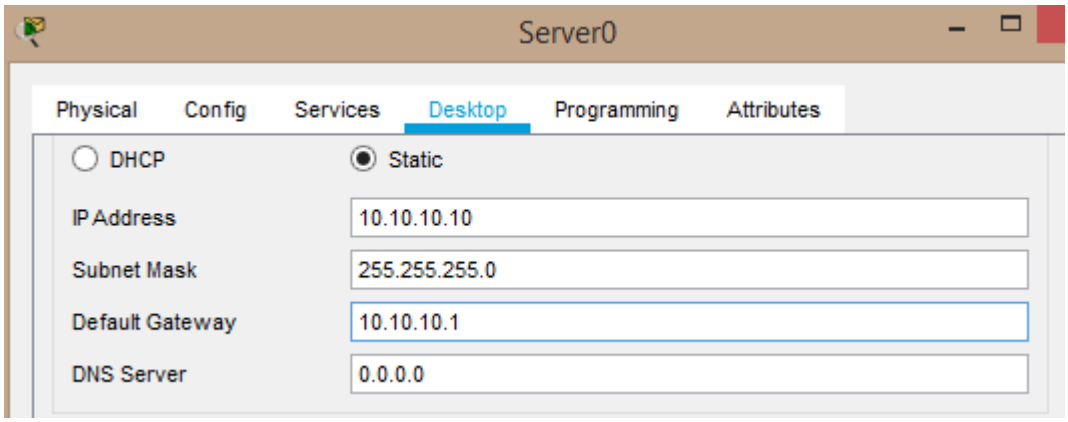


VLAN	Direccionamiento	Nombre
30	192.168.30.0/24	Administración
40	192.168.40.0/24	Mercadeo
200	192.168.200.0/24	Mantenimiento



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





R1

Bogota>
Bogota>enable
Bogota#configure t
Enter configuration commands, one per line. End with CNTL/Z.
Bogota(config)#no ip domain-lookup
Bogota(config)#enable secret class
Bogota(config)#line con 0
Bogota(config-line)#password cisco
Bogota(config-line)#login
Bogota(config-line)#line vty 0 4
Bogota(config-line)#password cisco
Bogota(config-line)#login
Bogota(config-line)#exit
Bogota(config)#service password-encryption
Bogota(config)#banner motd "Solo Personal Autorizado"
Bogota(config)#exit
Bogota#
%SYS-5-CONFIG_I: Configured from console by console

Bogota(config)#interface s0/0/0
%Invalid interface type and number
Bogota(config)#int s0/0/0
%Invalid interface type and number
Bogota(config)#int s0/1/0
Bogota(config-if)#ip address 172.31.21.1 255.255.255.252

Bogota(config-if)#no shutdown

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

R2

Router>enable
Router#configure t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname Miami
Miami(config)#no ip domain-lookup
Miami(config)#enable secret class
Miami(config)#line con 0
Miami(config-line)#password cisco
Miami(config-line)#login
Miami(config-line)#exit
Miami(config)#service password-encryption
Miami(config)#banner motd "Solo Personal Autorizado"
Miami(config)#exit
Miami#
%SYS-5-CONFIG_I: Configured from console by console

Miami(config-if)#
Miami(config-if)#exit
Miami(config)#interface s0/1/1
Miami(config-if)#ip address 172.31.23.1 255.255.255.252
Miami(config-if)#no shutdown

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

Miami(config)#interface s0/1/0
Miami(config-if)#ip address 172.31.21.2 255.255.255.252
Miami(config-if)#no shutdown

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

R3

Router(config)#hostname Aires
Aires(config)#hostname Aires

Aires(config)#no ip domain-lookup
Aires(config)#enable secret class
Aires(config)#line con 0
Aires(config-line)#password cisco
Aires(config-line)#login
Aires(config-line)#line vty 0 4
Aires(config-line)#password cisco
Aires(config-line)#login
Aires(config-line)#exit
Aires(config)#service password-encryption
Aires(config)#banner motd "Solo Personal Autorizado"
Aires(config)#exit
Aires#
%SYS-5-CONFIG_I: Configured from console by console

Aires(config)#interface s0/1/0
Aires(config-if)#ip address 172.31.23.2 255.255.255.252
Aires(config-if)#no shutdown

```
Aires(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
```

Aires(config-if)#ip address 192.168.5.1 255.255.255.0000
Aires(config-if)#no shutdown
Aires(config-if)#intreface lo4

```
%LINK-5-CHANGED: Interface Loopback4, changed state to up

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

Aires(config-if)#ip address 192.168.4.1 255.255.255.0000
Aires(config-if)#no shutdown
Aires(config-if)#interface lo6

```
%LINK-5-CHANGED: Interface Loopback6, changed state to up

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

Aires(config)#int s0/1/0
Aires(config-if)#ip address 192.168.4.1 255.255.255.0
Aires(config-if)#no shut

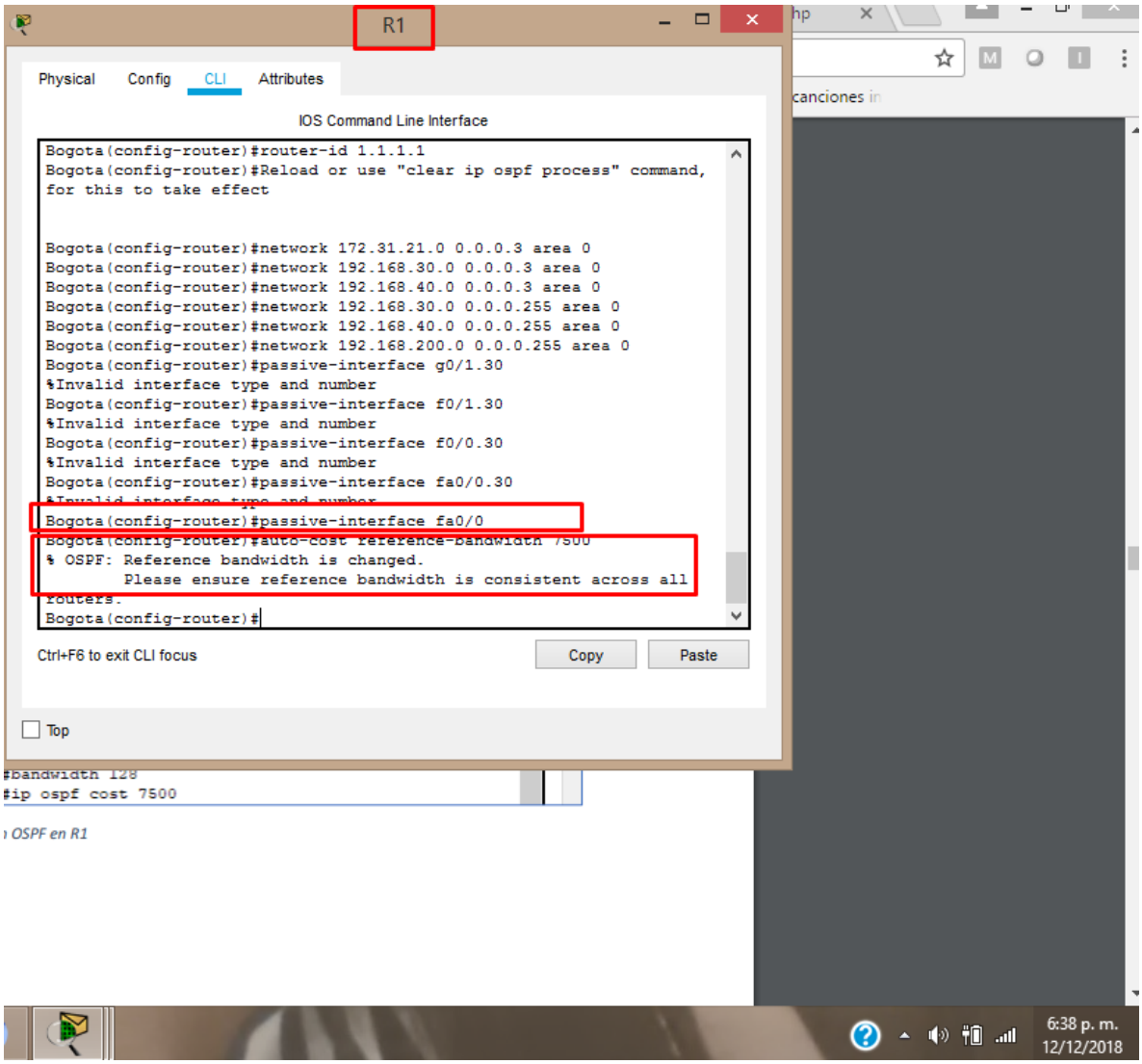
Aires(config-if)#int lo5

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

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

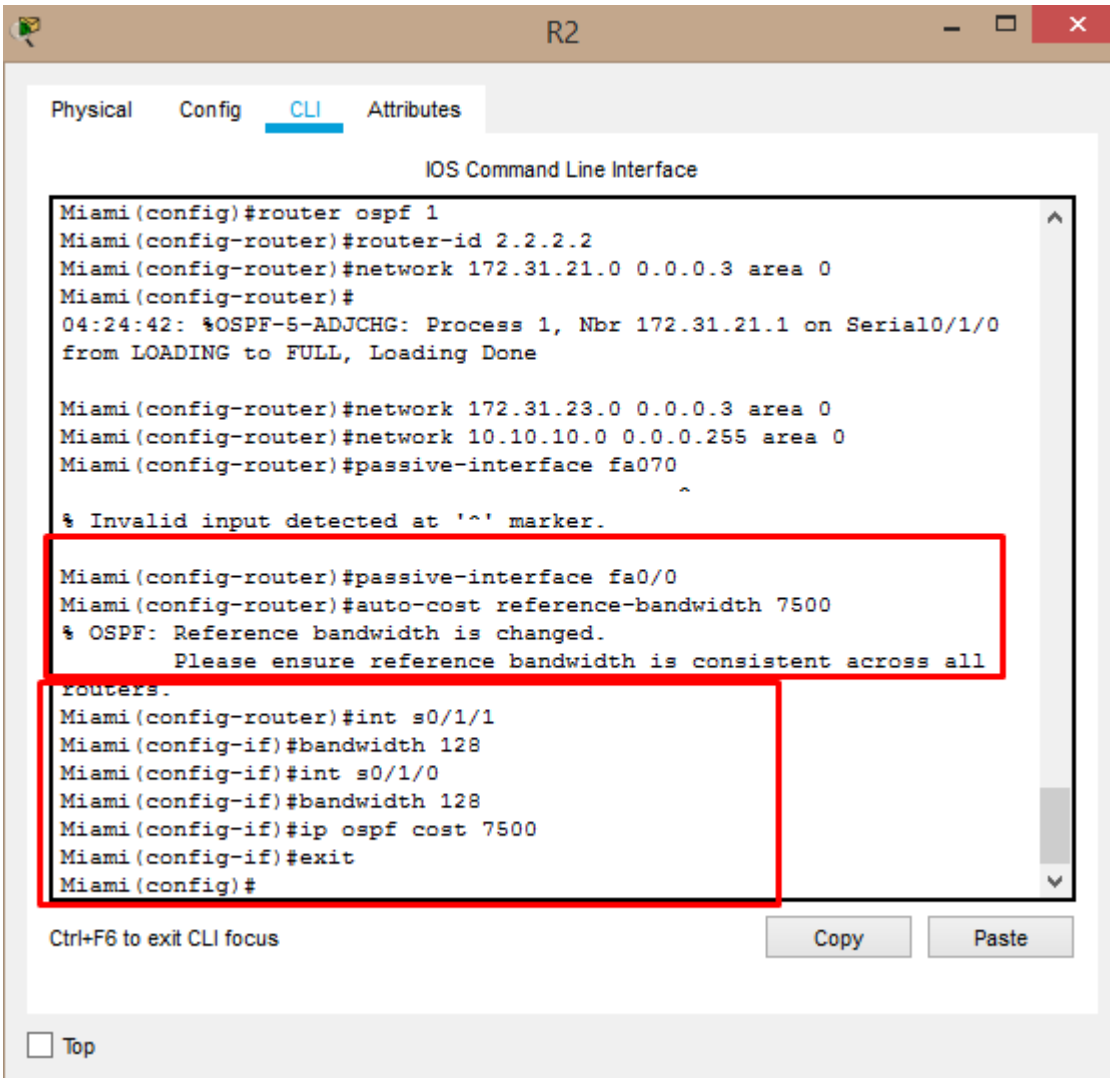
2. Configurar el protocolo de enrutamiento OSPFv2 bajo los siguientes criterios:

OSPFv2 area 0

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




```
Bogota(config)#int s0/1/0
Bogota(config-if)#bandw
% Incomplete command.
Bogota(config-if)#bandwidth 128
Bogota(config-if)#ip ospf cost 7500
Bogota(config-if)#
```



Aires(config)#router ospf 1
Aires(config-router)#router-id 8.8.8.8
Aires(config-router)#network 172.31.23.0 0.0.0.3 area 0
Aires(config-router)#network 192.168.4.0 0.0.0.3 area 0
Aires(config-router)#passive-interface lo4
Aires(config-router)#passive-interface lo5
Aires(config-router)#passive-interface lo6
Aires(config-router)#auto-cost reference-bandwidth 9500

```
Aires(config-router)#auto-cost reference-bandwidth 9500
% OSPF: Reference bandwidth is changed.
        Please ensure reference bandwidth is consistent across all
routers.
```

```
Aires(config)#int s0/1/0
Aires(config-if)#bandwidth 128
Aires(config-if)#exit
```

Verificar información de OSPF

- 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.

```
Neighbor ID     Pri   State           Dead Time   Address
Interface
2.2.2.2           0   FULL/  -        00:00:32    172.31.21.2
Serial0/1/0
Bogota#
```

```
Bogota#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 not set

     172.31.0.0/30 is subnetted, 2 subnets
C       172.31.21.0 is directly connected, Serial0/1/0
O       172.31.23.0 [110/12357] via 172.31.21.2, 00:31:00,
Serial0/1/0
```

```
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 172.31.21.1
  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 0.0.0.3 area 0
    192.168.40.0 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
  Passive Interface(s):
    FastEthernet0/0
  Routing Information Sources:
    Gateway         Distance      Last Update
    2.2.2.2              110      00:28:55
    172.31.21.1          110      00:06:08
  Distance: (default is 110)
```

```
Password:
Miami#show ip ospf neig

Neighbor ID     Pri   State           Dead Time   Address         Interface
172.31.21.1       0   FULL/  -        00:00:35    172.31.21.1     Serial0/1/0
Miami#
```

R2

Physical Config CLI Attributes

IOS Command Line Interface

```
Miami#show ip  ospf interface

Serial0/1/0 is up, line protocol is up
  Internet address is 172.31.21.2/30, Area 0
  Process ID 1, Router ID 2.2.2.2, Network Type POINT-TO-POINT, Cost: 7500
  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 172.31.21.1
  Suppress hello for 0 neighbor(s)
Serial0/1/1 is up, line protocol is up
  Internet address is 172.31.23.1/30, Area 0
  Process ID 1, Router ID 2.2.2.2, Network Type POINT-TO-POINT, Cost: 4857
  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--
```

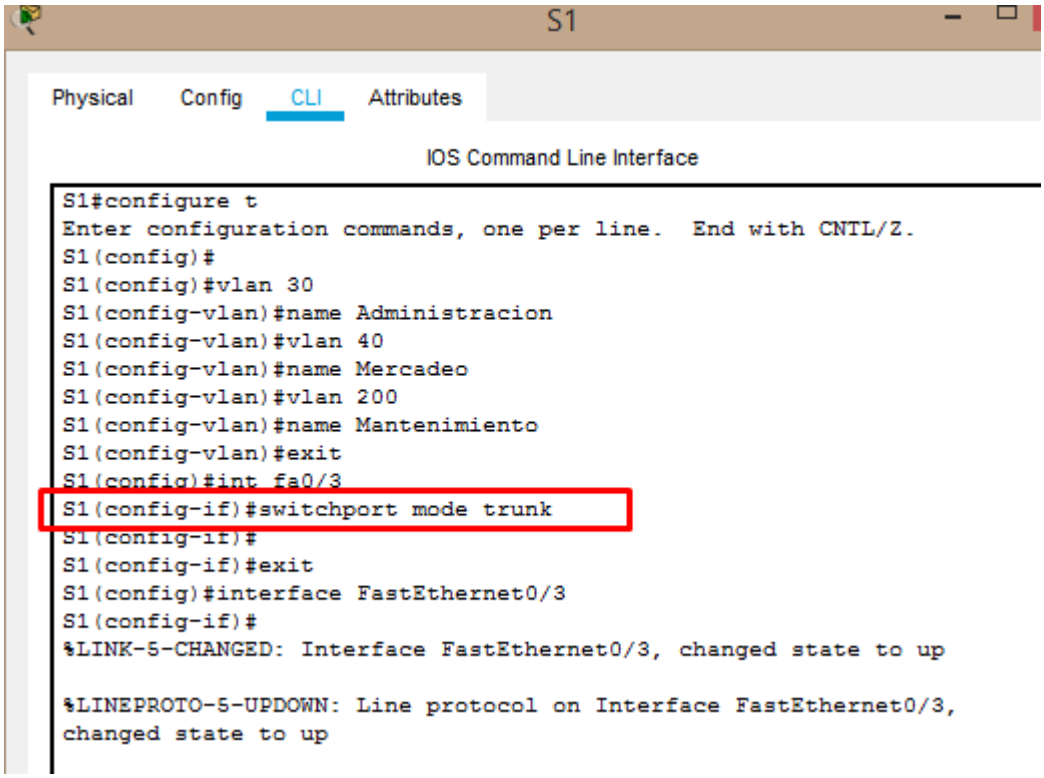
```
Miami#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - 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 not set

     172.31.0.0/30 is subnetted, 2 subnets
C       172.31.21.0 is directly connected, Serial0/1/0
C       172.31.23.0 is directly connected, Serial0/1/1
```

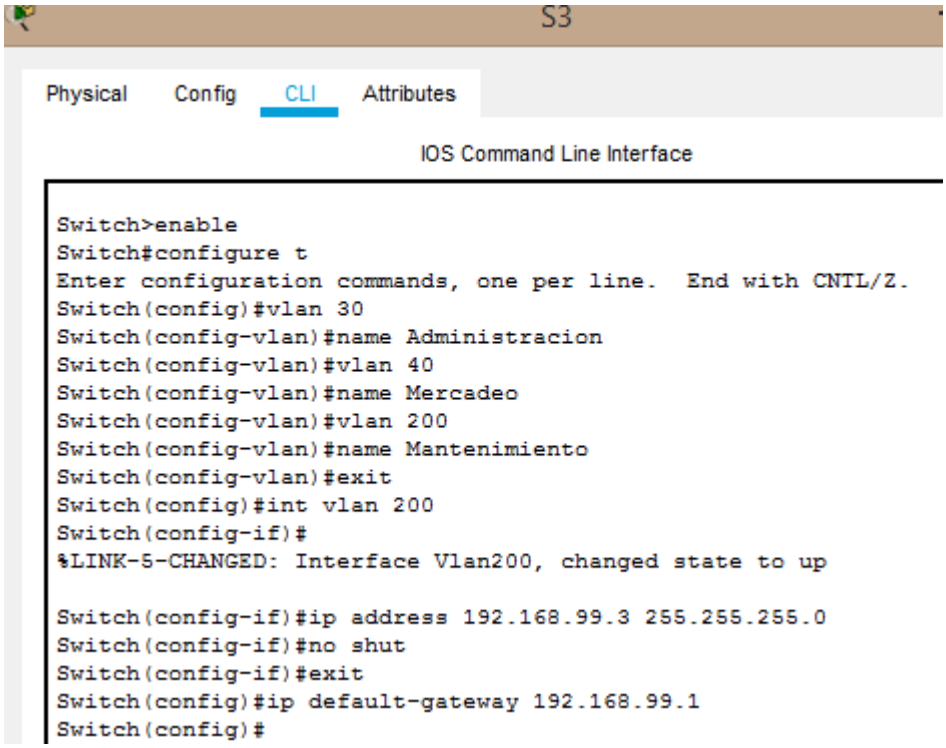
```
Routing Protocol is "ospf 1"
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Router ID 2.2.2.2
  Number of areas in this router is 1. 1 normal 0 stub 0 nssa
  Maximum path: 4
  Routing for Networks:
    172.31.21.0 0.0.0.3 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):
    FastEthernet0/0
  Routing Information Sources:
    Gateway         Distance      Last Update
    2.2.2.2              110      00:23:59
    172.31.21.1          110      00:01:12
  Distance: (default is 110)
```

```
Aires#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 not set

C    192.168.4.0/24 is directly connected, Serial0/1/0
```

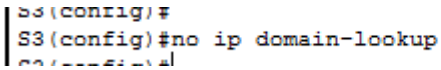
3. Configurar VLANs, Puertos troncales, puertos de acceso, encapsulamiento, Inter-VLAN Routing y Seguridad en los Switches acorde a la topología de red establecida.

```
S1>enable
S1#configure t
Enter configuration commands, one per line.  End with CNTL/Z.
S1(config)#
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)#
```

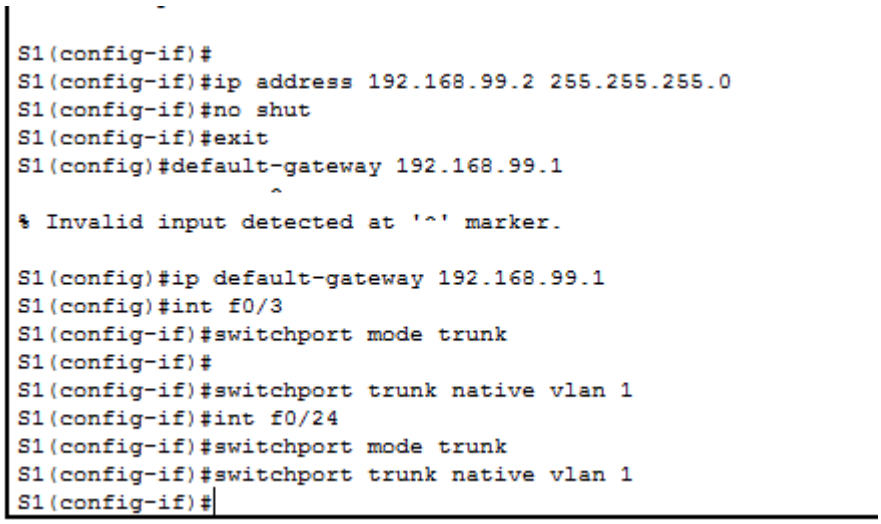




4. En el Switch 3 deshabilitar DNS lookup



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



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

```
S1(config-if)#switchport mode trunk
S1(config-if)#switchport trunk native vlan 1
S1(config-if)#int range fa0/2, fa0/4-23, g0/1-2
interface range not validated - command rejected
S1(config)#int range fa0/2, fa0/4-23
S1(config-if-range)#switch mode access
S1(config-if-range)#int fa0/1
S1(config-if)#switch mode access
S1(config-if)#switch access vlan
% Incomplete command.
S1(config-if)#switch access vlan
% Incomplete command.
S1(config-if)#switch access vlan 30
S1(config-if)#int range fa0/2, fa0/4-23
S1(config-if-range)#shutdown

%LINK-5-CHANGED: Interface FastEthernet0/2, changed state to
administratively down

%LINK-5-CHANGED: Interface FastEthernet0/16, changed state to
administratively down

%LINK-5-CHANGED: Interface FastEthernet0/17, changed state to
administratively down

%LINK-5-CHANGED: Interface FastEthernet0/18, changed state to
administratively down

%LINK-5-CHANGED: Interface FastEthernet0/19, changed state to
administratively down

%LINK-5-CHANGED: Interface FastEthernet0/20, changed state to
administratively down

%LINK-5-CHANGED: Interface FastEthernet0/21, changed state to
administratively down

%LINK-5-CHANGED: Interface FastEthernet0/22, changed state to
administratively down

%LINK-5-CHANGED: Interface FastEthernet0/23, changed state to
administratively down
S1(config-if-range)#
```

7. Implement DHCP and NAT for IPv4

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

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

```
Bogota#configure t
Enter configuration commands, one per line. End with CNTL/Z.
Bogota(config)#ip dhcp excluded-address 192.168.30.1 192.168.30.30
Bogota(config)#ip dhcp excluded-address 192.168.40.1 192.168.40.30
Bogota(config)#ip dhcp pool admin
Bogota(dhcp-config)#dns-server 10.10.10.11
Bogota(dhcp-config)#default-router 192.168.30.1
Bogota(dhcp-config)#network 192.168.30.0 255.255.255.0
Bogota(dhcp-config)#ip dhcp pool merca
Bogota(dhcp-config)#dns-server 10.10.10.11
Bogota(dhcp-config)#default-router 192.168.40.1
Bogota(dhcp-config)#network 192.168.40.0 255.255.255
Bogota(dhcp-config)#network 192.168.40.0 255.255.255.0
Bogota(dhcp-config)#
```

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.

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

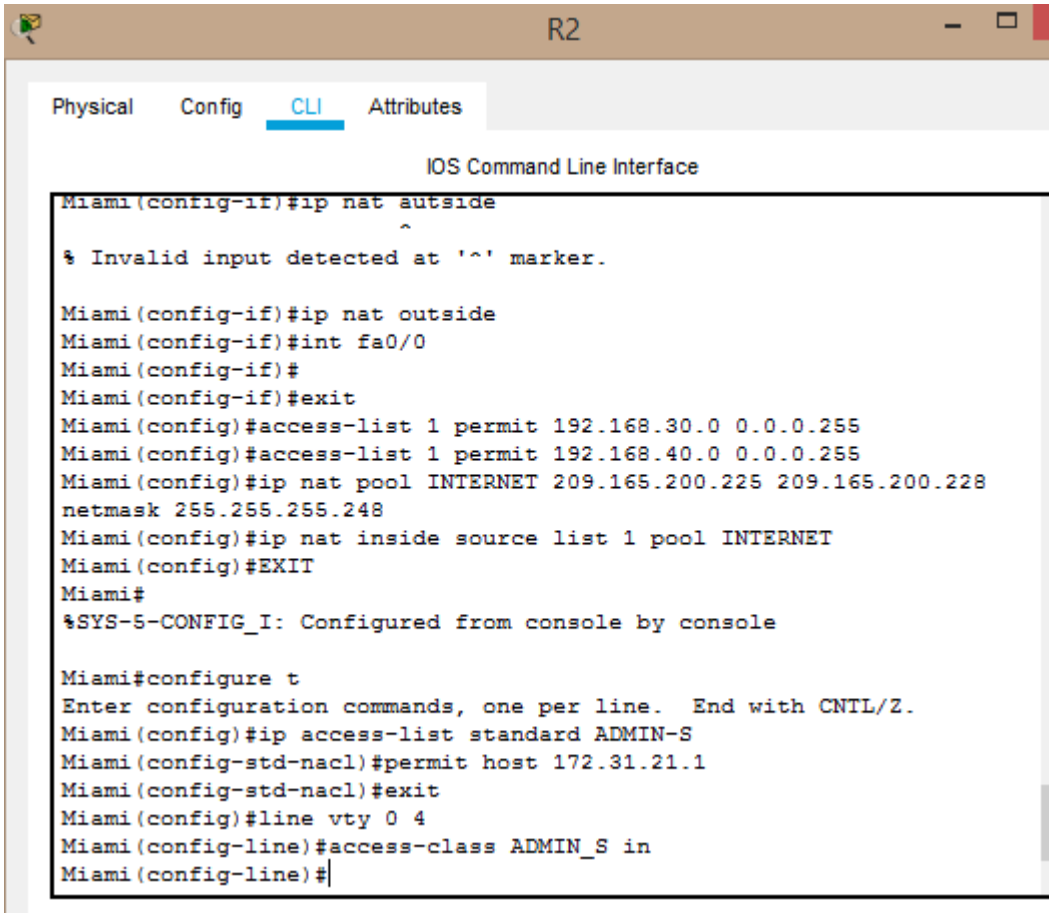
```
Miami#configure t
Enter configuration commands, one per line.  End with CNTL/Z.
Miami(config)#user webuser privilege 15 secret cisco 12345
Miami(config)#ip http server
                  ^
% Invalid input detected at '^' marker.

Miami(config)#
```

```
Miami(config)#ip http authentication local
                  ^
```

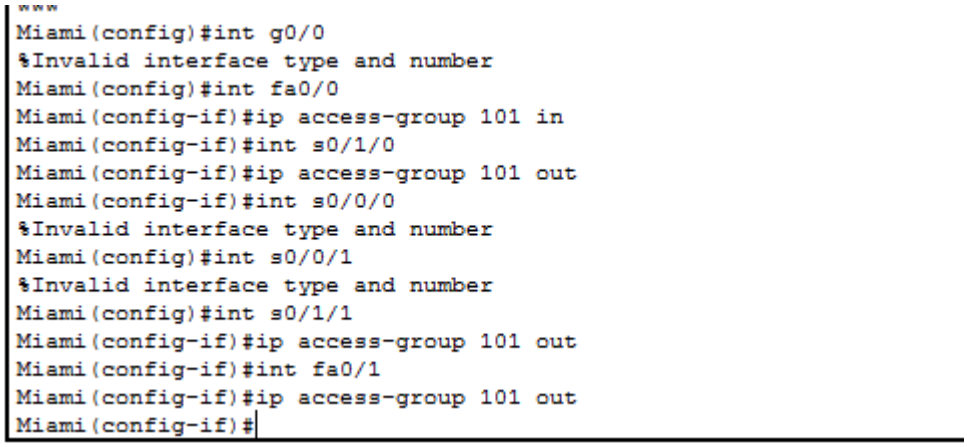
Nota: dado que no se pueden utilizar los comandos: ip http server y ip http authentication local, se emplea un servidor dentro de la topología.

```
Miami(config)#ip nat inside source static 10.10.10.10 209.165.200.229
Miami(config)#int f0/1
Miami(config-if)#ip nat outside
Miami(config-if)#int fa0/0
```

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.



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.



13. Verificar procesos de comunicación y re direccionamiento de tráfico en los routers mediante el uso de Ping y Traceroute.

```
Miami#show access-lists
Standard IP access list 1
    10 permit 192.168.30.0 0.0.0.255
    20 permit 192.168.40.0 0.0.0.255
Standard IP access list ADMIN-S
    10 permit host 172.31.21.1
Extended IP access list 101
    10 permit tcp any host 209.165.200.229 eq www
```

```
Password:
Bogota#ping 209.165.200.230

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 209.165.200.230, timeout is 2
seconds:
.....
```

Conclusiones

De acuerdo al trabajo realizado se tiene claridad sobre las configuraciones de red las cuales forman parte de las actividades evaluativas del Diplomado de Profundización CCNA I y II, realizando pruebas en los niveles de comprensión y solución de problemas relacionados con diversos aspectos de Networking.

Mediante el trabajo evaluativo se desarrollan dos escenarios en la herramienta de Packet Tracer, acorde con los lineamientos establecidos para el direccionamiento IP, protocolos de enrutamiento y demás aspectos que forman parte de la topología de red.

Se tiene en cuenta la importancia de procesos de documentación de la solución, correspondientes al registro de la configuración de cada uno de los dispositivos, la descripción detallada del paso a paso de cada una de las etapas realizadas durante el desarrollo, el registro de los procesos de verificación de conectividad mediante el uso de comandos ping, traceroute, show ip route, entre otros, para hacer actividades de retroalimentación y mejora en el futuro.

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