

EVALUACION: PRUEBA DE HABILIDADES PRACTICAS
(CCNA1, CCNA2)

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2018

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INTRODUCCION

La prueba de habilidades prácticas, corresponde a una solución de un caso de networking dispuesto mediante evaluación que pone a prueba lo aprendido a lo largo del desarrollo del curso y se evidencia en este informe a manera de práctica.

En este Informe se registra 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.

Para el desarrollo de esta prueba de habilidades se escogió libremente la **herramienta de Simulación Packet Tracer**, con la cual se resolverá cada contexto que exige la prueba.

OBJETIVOS

GENERAL

Dar solución evidenciando el proceso paso a paso al **Escenario consistente en:** Una empresa de Tecnología posee tres sucursales distribuidas en las ciudades de Bogotá, Medellín y Bucaramanga, 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.

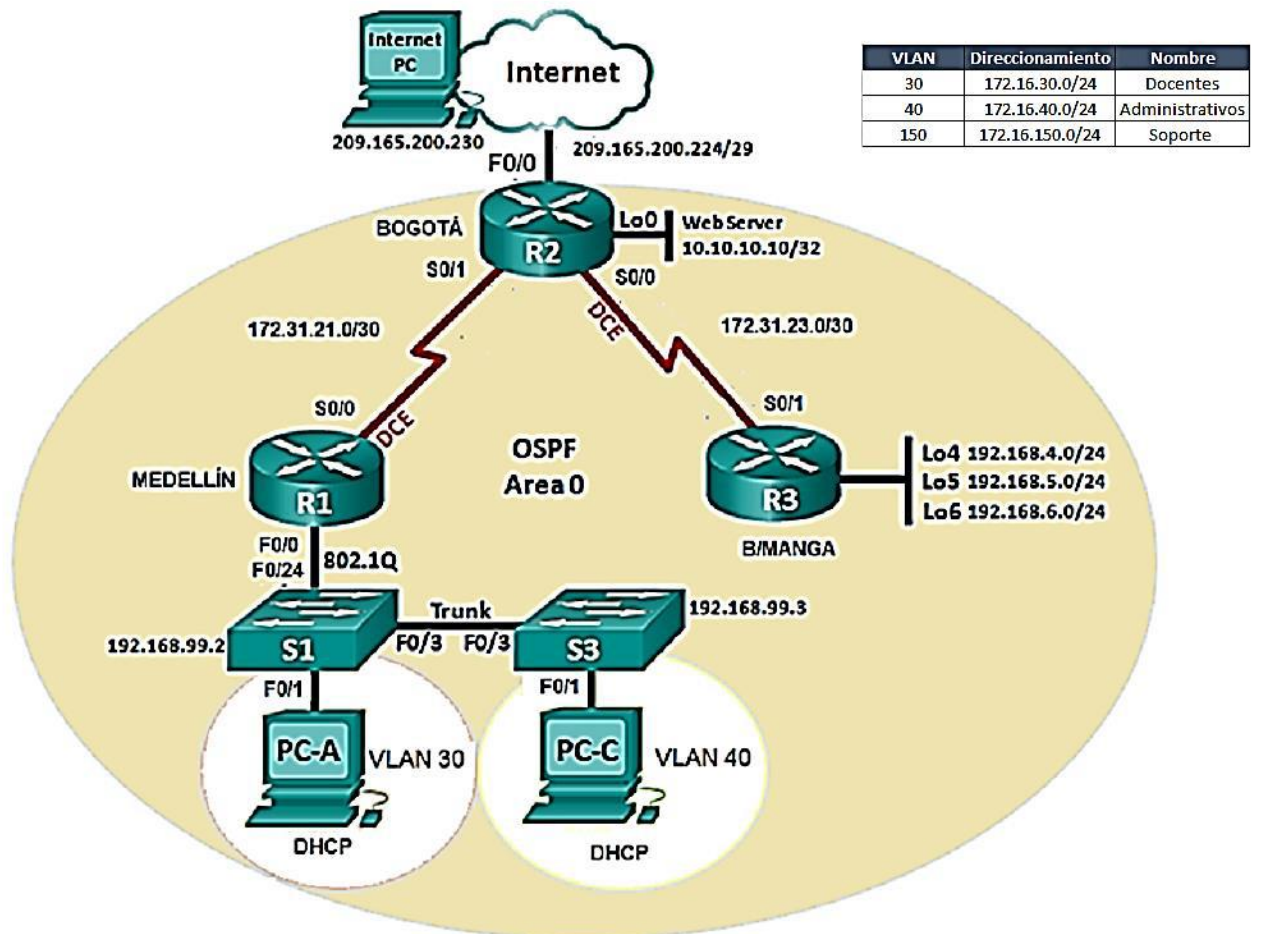
ESPECIFICOS

- Crear la topología física y lógica de la red del escenario a desarrollarse.
- Configurar la topología, direccionamiento ip, protocolos de enrutamiento especificada en el escenario objeto de la prueba.
- Simular cada uno de los pasos propuestos en la evaluación evidenciando el paso a paso del desarrollo de la solución.
- Ejecutar en los dispositivos los comandos ping, traceroute, show ip route, y otros de acuerdo a lo que se solicite en la prueba con el ánimo de verificar la conectividad y configuración de los dispositivos que hacen parte de la topología a desarrollar.

DESCRIPCIÓN DEL ESCENARIO PROPUESTO PARA LA PRUEBA DE HABILIDADES

Escenario: Una empresa de Tecnología posee tres sucursales distribuidas en las ciudades de Bogotá, Medellín y Bucaramanga, en donde el estudiante será el administrador de la red, el cual deberá configurar e interconectar entre sí cada uno de los dispositivos que forman parte del escenario, acorde con los lineamientos establecidos para el direccionamiento IP, protocolos de enrutamiento y demás aspectos que forman parte de la topología de red.

Topología de red



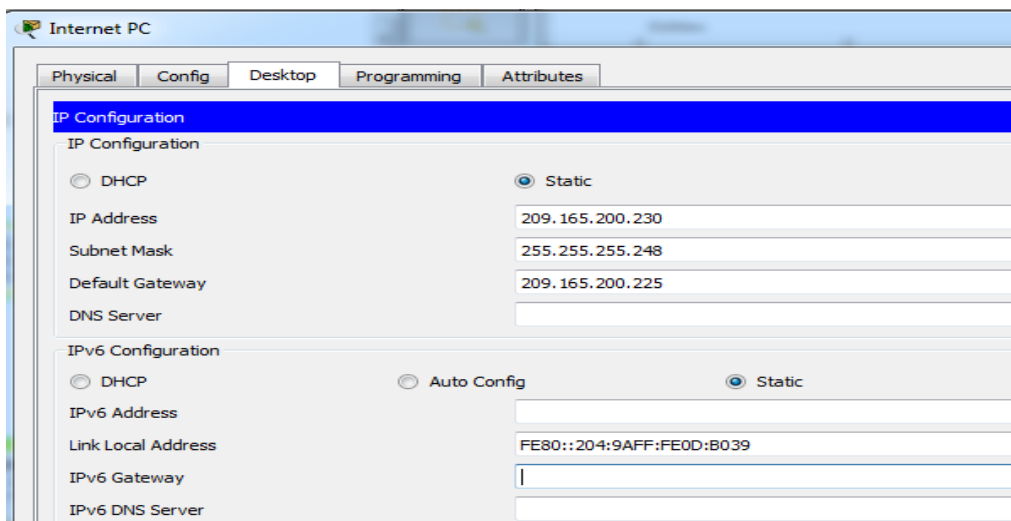
Configurar el direccionamiento IP acorde con la topología de red para cada uno de los dispositivos que forman parte del escenario.

Tabla de direccionamiento

Dispositivo	Interfaz	Dirección IP	Máscara de subred	Gateway predeterminado
R1 (MEDELLIN)	S0/0/0 (DCE)	172.31.21.1	255.255.255.252	N/A
	G0/0	192.168.13.1	255.255.255.252	N/A
R2 (BOGOTA)	G0/0	209.165.200.225	255.255.255.248	N/A
	G0/1	10.10.10.1	255.255.255.0	N/A
	S0/0/0 (DCE)	172.31.23.1	255.255.255.252	N/A
	S0/0/1	172.31.21.2	255.255.255.252	N/A
R3 (B/MANGA)	S0/0/1	172.31.23.2	255.255.255.252	N/A
	Lo4	192.168.4.1	255.255.255.0	N/A
	Lo5	192.168.5.1	255.255.255.0	N/A
	Lo6	192.168.6.1	255.255.255.0	N/A
Internet PC	NIC	209.165.200.230	255.255.255.248	209.165.200.225
Web Server	Fa0	10.10.10.10	255.255.255.0	10.10.10.1
PC-A	F0/1	DHCP	DHCP	DHCP
PC-C	F0/1	DHCP	DHCP	DHCP

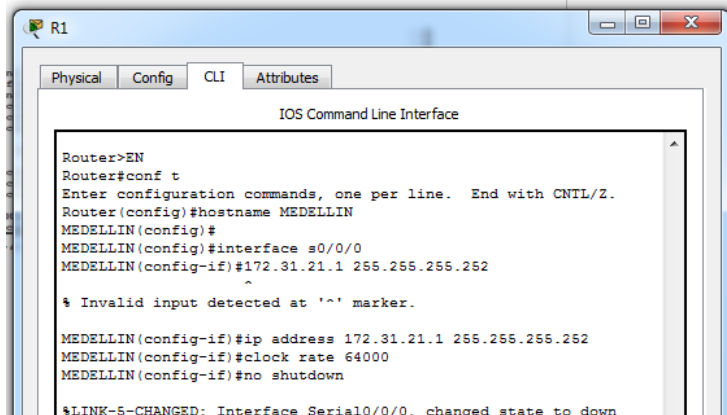
1. Configurar el direccionamiento IP acorde con la topología de red para cada uno de los dispositivos que forman parte del escenario

Direccionamiento ip (Internet PC)



R1 (MEDELLIN)

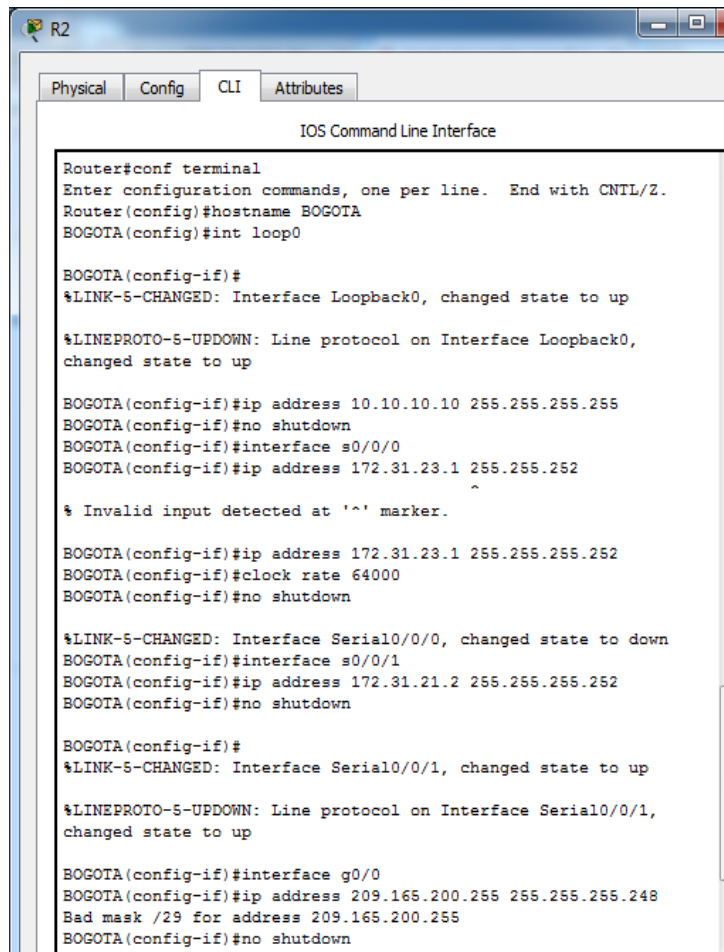
```
conf t
hostname MEDELLIN
int s0/0/0
ip add 172.31.21.1 255.255.255.252
clock rate 64000
no shu
```

A screenshot of a Cisco IOS CLI window for router R1. The window title is 'R1' and it has tabs for 'Physical', 'Config', 'CLI', and 'Attributes'. The 'CLI' tab is active, showing the 'IOS Command Line Interface'. The terminal output shows the following commands and responses:

```
Router>EN
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname MEDELLIN
MEDELLIN(config)#
MEDELLIN(config)#interface s0/0/0
MEDELLIN(config-if)#172.31.21.1 255.255.255.252
^
% Invalid input detected at '^' marker.
MEDELLIN(config-if)#ip address 172.31.21.1 255.255.255.252
MEDELLIN(config-if)#clock rate 64000
MEDELLIN(config-if)#no shutdown
%LINK-S-CHANGED: Interface Serial10/0/0, changed state to down
```

R2 (BOGOTA)

```
conf t
hostname BOGOTÁ
int loop0
ip add 10.10.10.10 255.255.255.255
no shut
int s0/0/0
ip add 172.31.23.1 255.255.255.252
clock rate 64000
no shu
int s0/0/1
ip add 172.31.21.2 255.255.255.252
no shutdown
int g0/0
ip add 209.165.200.225
255.255.255.248
no shutdown
```

A screenshot of a Cisco IOS CLI window for router R2. The window title is 'R2' and it has tabs for 'Physical', 'Config', 'CLI', and 'Attributes'. The 'CLI' tab is active, showing the 'IOS Command Line Interface'. The terminal output shows the following commands and responses:

```
Router#conf terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname BOGOTA
BOGOTA(config)#int loop0
BOGOTA(config-if)#
%LINK-S-CHANGED: Interface Loopback0, changed state to up
%LINEPROTO-S-UPDOWN: Line protocol on Interface Loopback0,
changed state to up
BOGOTA(config-if)#ip address 10.10.10.10 255.255.255.255
BOGOTA(config-if)#no shutdown
BOGOTA(config-if)#interface s0/0/0
BOGOTA(config-if)#ip address 172.31.23.1 255.255.252
^
% Invalid input detected at '^' marker.
BOGOTA(config-if)#ip address 172.31.23.1 255.255.255.252
BOGOTA(config-if)#clock rate 64000
BOGOTA(config-if)#no shutdown
%LINK-S-CHANGED: Interface Serial10/0/0, changed state to down
BOGOTA(config-if)#interface s0/0/1
BOGOTA(config-if)#ip address 172.31.21.2 255.255.255.252
BOGOTA(config-if)#no shutdown
BOGOTA(config-if)#
%LINK-S-CHANGED: Interface Serial10/0/1, changed state to up
%LINEPROTO-S-UPDOWN: Line protocol on Interface Serial10/0/1,
changed state to up
BOGOTA(config-if)#interface g0/0
BOGOTA(config-if)#ip address 209.165.200.255 255.255.255.248
Bad mask /29 for address 209.165.200.255
BOGOTA(config-if)#no shutdown
```

R3 (B7MANGA)

config t

hostname BUCARAMANGA

int loop4

ip add 192.168.4.1 255.255.255.0

no shut

int loop5

ip add 192.168.5.1 255.255.255.0

no shut

int loop4

ip add 192.168.6.1 255.255.255.0

no shut

int s0/0/1

ip add 172.31.23.2
255.255.255.252

no shu

```
Router>en
Router#configure t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname BUCARAMANGA
BUCARAMANGA(config)#int loop4

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

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

BUCARAMANGA(config-if)#ip address 192.168.4.1 255.255.255.0
BUCARAMANGA(config-if)#no shutdown
BUCARAMANGA(config-if)#int loop5

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

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

BUCARAMANGA(config-if)#ip address 192.168.5.1 255.255.255.0
BUCARAMANGA(config-if)#no shutdown
BUCARAMANGA(config-if)#int loop4
BUCARAMANGA(config-if)#ip address 192.168.6.1 255.255.255.0
BUCARAMANGA(config-if)#no shutdown
BUCARAMANGA(config-if)#interface s0/0/1
BUCARAMANGA(config-if)#ip address 172.31.23.2 255.255.255.252
BUCARAMANGA(config-if)#no shutdown

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

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

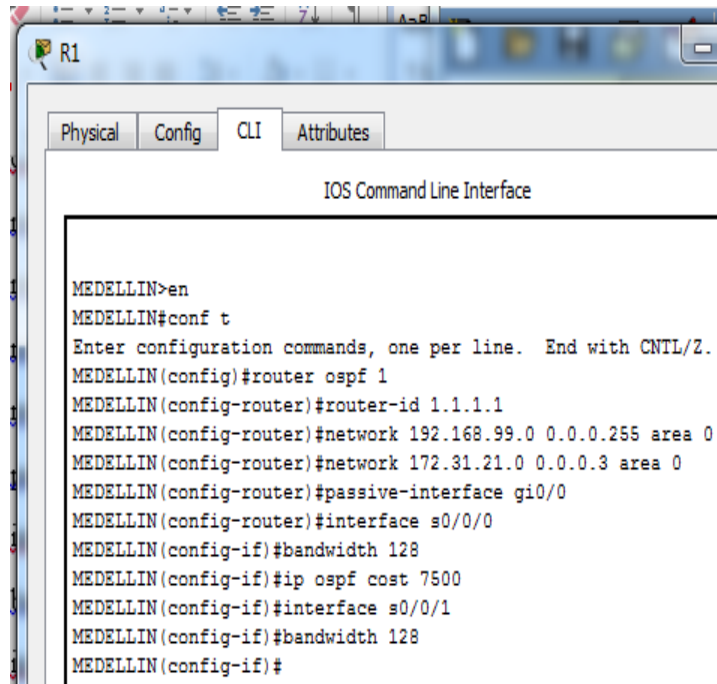
OSPFv2 area 0

Configuration Item or Task	Specification
Router ID R1	1.1.1.1
Router ID R2	2.2.2.2
Router ID R3	3.3.3.3
Configurar todas las interfaces LAN como pasivas	
Establecer el ancho de banda para enlaces seriales en	128 Kb/s
Ajustar el costo en la métrica de S0/0 a	7500

CONFIGURACIÓN OSPF V2

R1 (MEDELLIN)

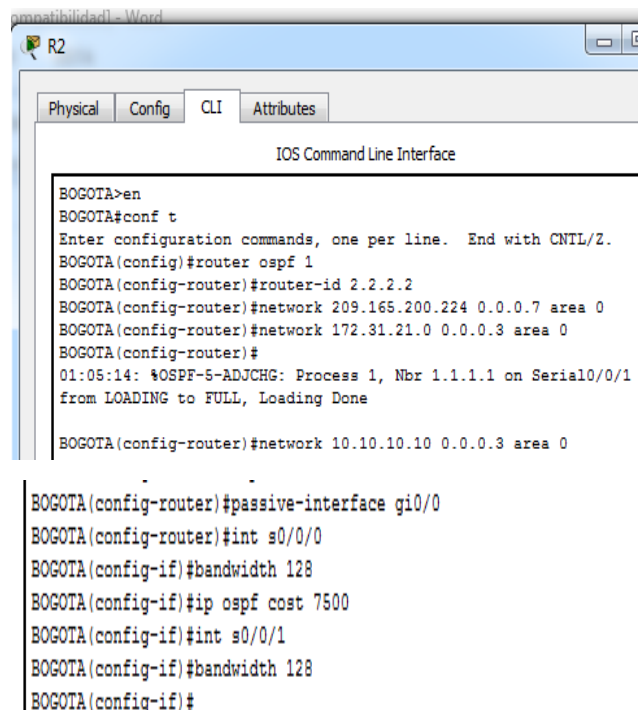
```
config t
router ospf 1
router-id 1.1.1.1
network 192.168.99.0 0.0.0.255
area 0
network 172.31.21.0 0.0.0.3
area 0
passive-interface gi0/0
int s0/0/0
bandwidth 128
ip ospf cost 7500
int s0/0/1
bandwidth 128
```

A screenshot of a Cisco IOS Command Line Interface window for router R1. The window has tabs for Physical, Config, CLI, and Attributes. The CLI tab is active, showing the following configuration commands:

```
MEDELLIN>en
MEDELLIN#conf t
Enter configuration commands, one per line. End with CNTL/Z.
MEDELLIN(config)#router ospf 1
MEDELLIN(config-router)#router-id 1.1.1.1
MEDELLIN(config-router)#network 192.168.99.0 0.0.0.255 area 0
MEDELLIN(config-router)#network 172.31.21.0 0.0.0.3 area 0
MEDELLIN(config-router)#passive-interface gi0/0
MEDELLIN(config-router)#interface s0/0/0
MEDELLIN(config-if)#bandwidth 128
MEDELLIN(config-if)#ip ospf cost 7500
MEDELLIN(config-if)#interface s0/0/1
MEDELLIN(config-if)#bandwidth 128
MEDELLIN(config-if)#
```

R2 (BOGOTA)

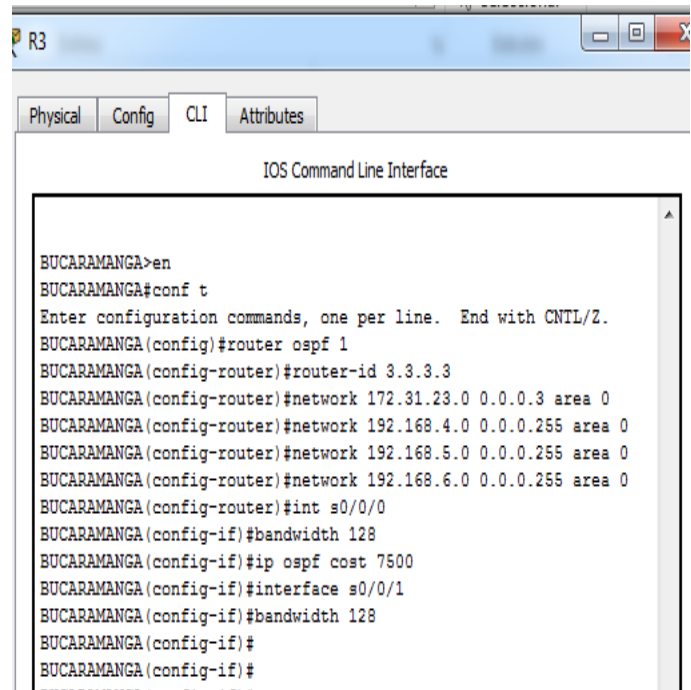
```
config t
router ospf 1
router-id 2.2.2.2
network 209.165.200.224 0.0.0.7 area 0
network 172.31.21.0 0.0.0.3 area 0
network 10.10.10.10 0.0.0.3 area 0
passive-interface gi0/0
int s0/0/0
bandwidth 128
ip ospf cost 7500
int s0/0/1
bandwidth 128
```

A screenshot of a Cisco IOS Command Line Interface window for router R2. The window has tabs for Physical, Config, CLI, and Attributes. The CLI tab is active, showing the following configuration commands:

```
BOGOTA>en
BOGOTA#conf t
Enter configuration commands, one per line. End with CNTL/Z.
BOGOTA(config)#router ospf 1
BOGOTA(config-router)#router-id 2.2.2.2
BOGOTA(config-router)#network 209.165.200.224 0.0.0.7 area 0
BOGOTA(config-router)#network 172.31.21.0 0.0.0.3 area 0
BOGOTA(config-router)#
01:05:14: %OSPF-5-ADJCHG: Process 1, Nbr 1.1.1.1 on Serial0/0/1
from LOADING to FULL, Loading Done
BOGOTA(config-router)#network 10.10.10.10 0.0.0.3 area 0
BOGOTA(config-router)#passive-interface gi0/0
BOGOTA(config-router)#int s0/0/0
BOGOTA(config-if)#bandwidth 128
BOGOTA(config-if)#ip ospf cost 7500
BOGOTA(config-if)#int s0/0/1
BOGOTA(config-if)#bandwidth 128
BOGOTA(config-if)#
```

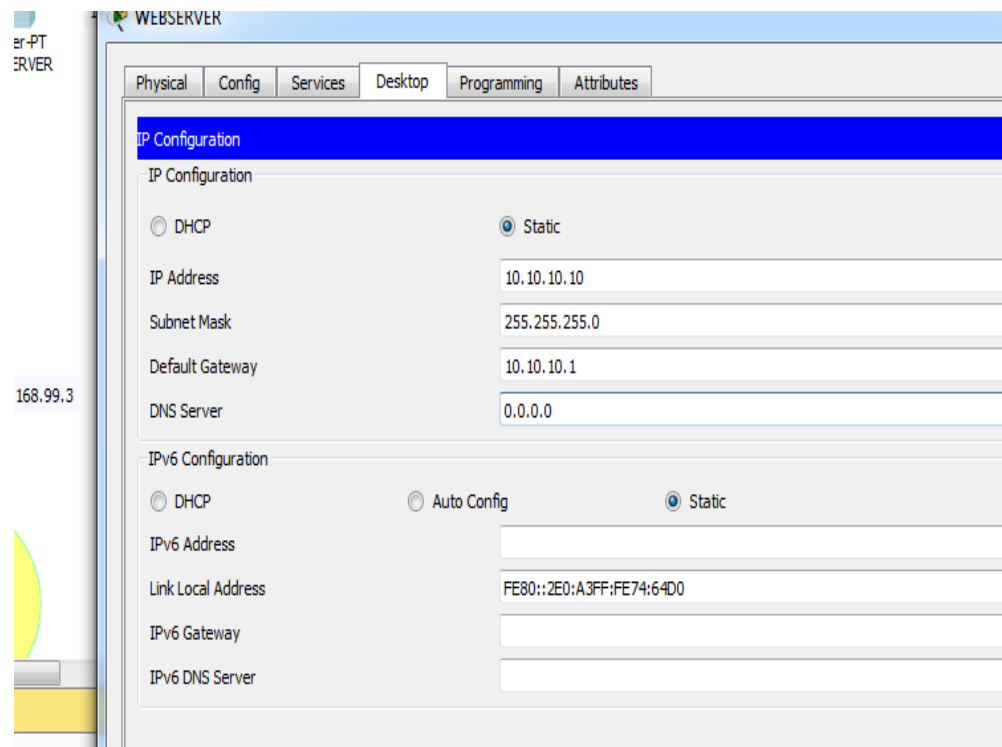
R3 (B/MANGA)

```
config t
router ospf 1
router-id 3.3.3.3
network 172.31.23.0 0.0.0.3 area 0
network 192.168.4.0 0.0.0.255 area 0
network 192.168.5.0 0.0.0.255 area 0
network 192.168.6.0 0.0.0.255 area 0
int s0/0/0
bandwidth 128
ip ospf cost 7500
int s0/0/1
bandwidth 128
```



```
R3
Physical Config CLI Attributes
IOS Command Line Interface
BUCARAMANGA>en
BUCARAMANGA#conf t
Enter configuration commands, one per line. End with CNTL/Z.
BUCARAMANGA(config)#router ospf 1
BUCARAMANGA(config-router)#router-id 3.3.3.3
BUCARAMANGA(config-router)#network 172.31.23.0 0.0.0.3 area 0
BUCARAMANGA(config-router)#network 192.168.4.0 0.0.0.255 area 0
BUCARAMANGA(config-router)#network 192.168.5.0 0.0.0.255 area 0
BUCARAMANGA(config-router)#network 192.168.6.0 0.0.0.255 area 0
BUCARAMANGA(config-router)#int s0/0/0
BUCARAMANGA(config-if)#bandwidth 128
BUCARAMANGA(config-if)#ip ospf cost 7500
BUCARAMANGA(config-if)#interface s0/0/1
BUCARAMANGA(config-if)#bandwidth 128
BUCARAMANGA(config-if)#
BUCARAMANGA(config-if)#
```

Configuración WEB Server



WEB SERVER

Physical Config Services Desktop Programming Attributes

IP Configuration

DHCP Static

IP Address: 10.10.10.10

Subnet Mask: 255.255.255.0

Default Gateway: 10.10.10.1

DNS Server: 0.0.0.0

IPv6 Configuration

DHCP Auto Config Static

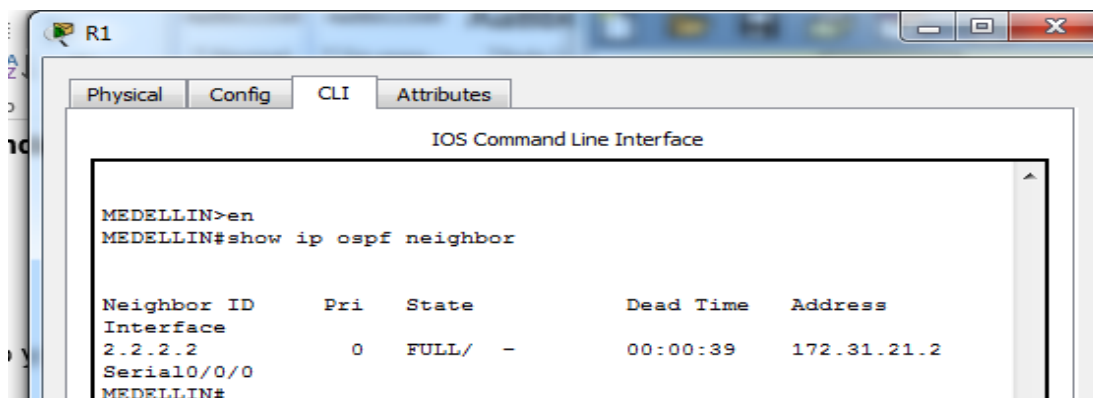
IPv6 Address: [Empty]

Link Local Address: FE80::2E0:A3FF:FE74:64D0

IPv6 Gateway: [Empty]

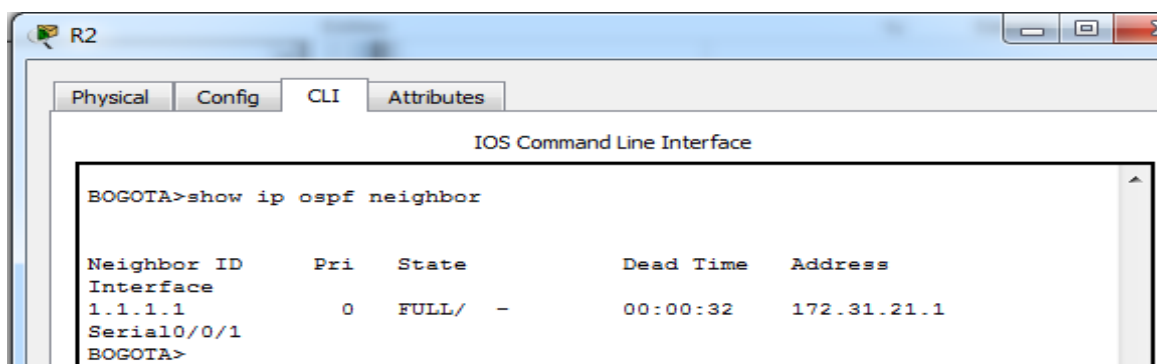
IPv6 DNS Server: [Empty]

Verificar información de OSPF



```
MEDELLIN>en
MEDELLIN#show ip ospf neighbor

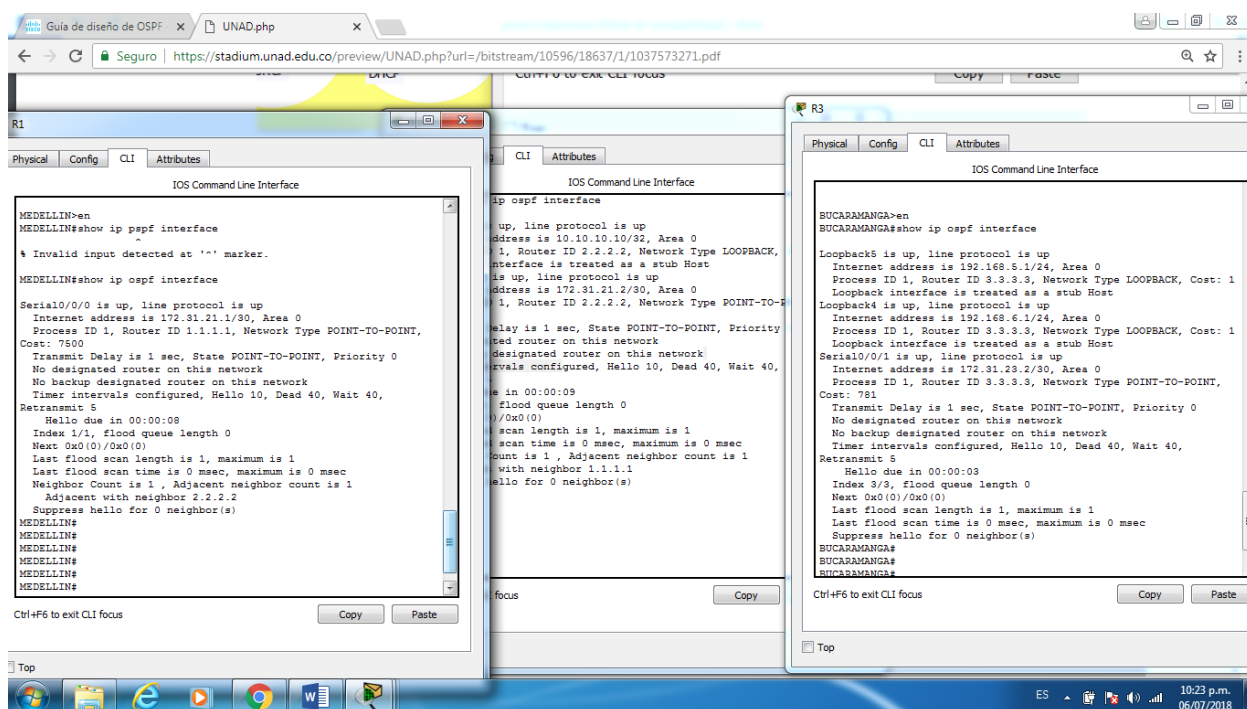
Neighbor ID      Pri   State           Dead Time   Address
Interface
2.2.2.2          0    FULL/ -         00:00:39   172.31.21.2
Serial0/0/0
MEDELLIN#
```



```
BOGOTA>show ip ospf neighbor

Neighbor ID      Pri   State           Dead Time   Address
Interface
1.1.1.1          0    FULL/ -         00:00:32   172.31.21.1
Serial0/0/1
BOGOTA>
```

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



The screenshot shows a web browser with a search for "Guía de diseño de OSPF" and a preview of a document from UNAD. Below the browser, three router CLI windows are open, each displaying OSPF interface information:

- R1:** Shows configuration for Serial0/0/0 with a cost of 7500.
- R2:** Shows configuration for Serial0/0/1 with a cost of 7500.
- R3:** Shows configuration for Loopback5, Loopback4, and Serial0/0/1 with costs of 1, 1, and 7500 respectively.

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

R1

Physical Config CLI Attributes

IOS Command Line Interface

```
MEDELLIN>en
MEDELLIN#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:
    192.168.99.0 0.0.0.255 area 0
    172.31.21.0 0.0.0.3 area 0
  Passive Interface(s):
    GigabitEthernet0/0
  Routing Information Sources:
    Gateway         Distance      Last Update
    1.1.1.1          110          00:18:37
    2.2.2.2          110          00:18:37
```

R2

Physical Config CLI Attributes

IOS Command Line Interface

```
BOGOTA>en
BOGOTA#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 2.2.2.2
  Number of areas in this router is 1. 1 normal 0 stub 0 nssa
  Maximum path: 4
  Routing for Networks:
    209.165.200.224 0.0.0.7 area 0
    172.31.21.0 0.0.0.3 area 0
    10.10.10.8 0.0.0.3 area 0
  Passive Interface(s):
    GigabitEthernet0/0
  Routing Information Sources:
    Gateway         Distance      Last Update
    1.1.1.1          110          00:16:06
    2.2.2.2          110          00:16:06
  Distance: (default is 110)

BOGOTA#
```

```

R3
Physical Config CLI Attributes
IOS Command Line Interface
BUCARAMANGA>en
BUCARAMANGA#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 3.3.3.3
  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
    3.3.3.3          110          00:17:41
  Distance: (default is 110)

```

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

Crear vlans S1

```

S1
Physical Config CLI Attributes
IOS Command Line Interface
Press RETURN to get started!

%LINK-5-CHANGED: Interface FastEthernet0/1, change
%LINEPROTO-5-UPDOWN: Line protocol on Interface Fa
changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/3, change
%LINEPROTO-5-UPDOWN: Line protocol on Interface Fa
changed state to up

S1>en
S1#conf t
Enter configuration commands, one per line. End w:
S1(config)#no ip domain-lookup
S1(config)#vlan 30
S1(config-vlan)#name DOCENTES
S1(config-vlan)#vlan 40
S1(config-vlan)#name ADMINISTRATIVOS
S1(config-vlan)#vlan 150
S1(config-vlan)#name SOPORTE
S1(config-vlan)#

```

Creación vlans S3

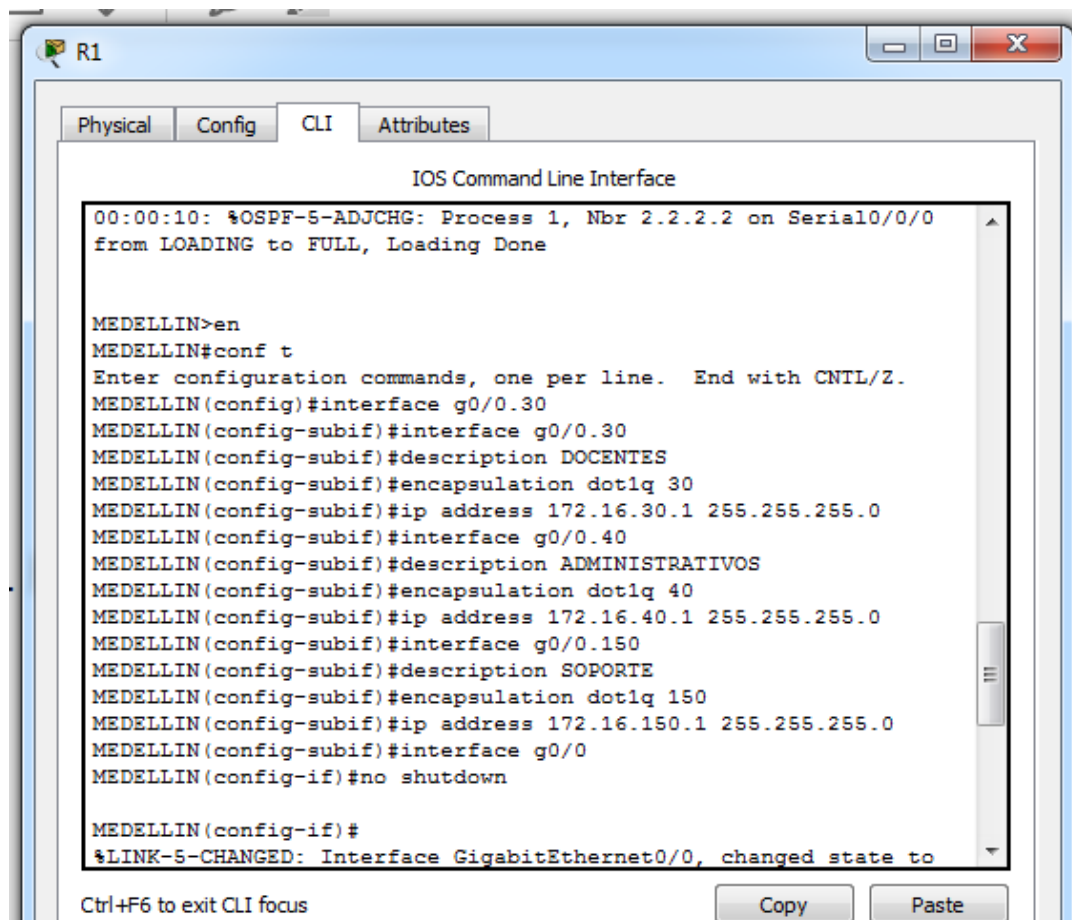
```

S3
Physical Config CLI Attributes
IOS Command Line Interface
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastE
changed state to up

S3>EN
S3#conf t
Enter configuration commands, one per line. End with
S3(config)#vlan 30
S3(config-vlan)#name DOCENTES
S3(config-vlan)#vlan 40
S3(config-vlan)#name ADMINISTRATIVOS
S3(config-vlan)#vlan 150
S3(config-vlan)#name SOPORTE
S3(config-vlan)#EXIT
S3(config)#EXIT
S3#
%SYS-5-CONFIG_I: Configured from console by console

S3#
S3#
S3#
S3#
S3#
S3#
c**

```



The screenshot shows a network simulator window titled 'R1'. It has four tabs: 'Physical', 'Config', 'CLI', and 'Attributes'. The 'CLI' tab is active, displaying the 'IOS Command Line Interface'. The terminal output shows the following sequence of commands and responses:

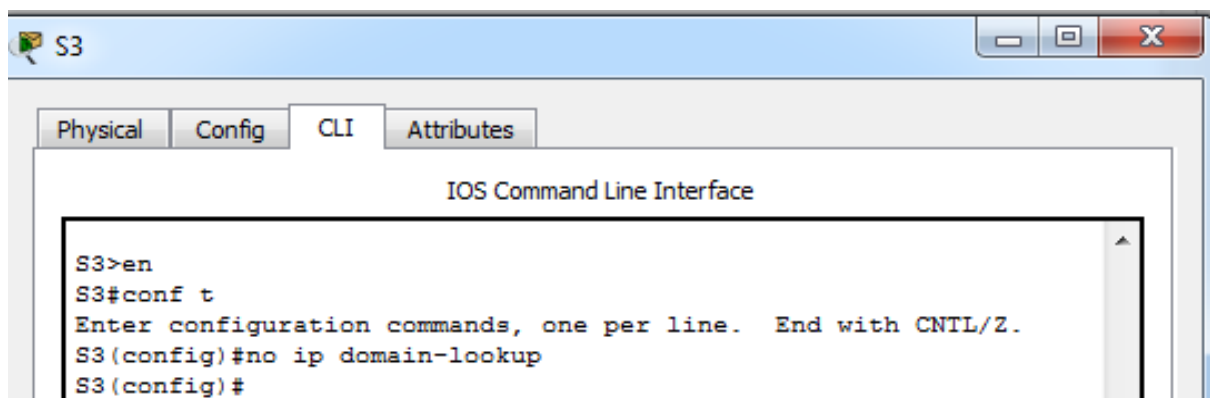
```
00:00:10: %OSPF-5-ADJCHG: Process 1, Nbr 2.2.2.2 on Serial0/0/0
from LOADING to FULL, Loading Done

MEDELLIN>en
MEDELLIN#conf t
Enter configuration commands, one per line. End with CNTL/Z.
MEDELLIN(config)#interface g0/0.30
MEDELLIN(config-subif)#interface g0/0.30
MEDELLIN(config-subif)#description DOCENTES
MEDELLIN(config-subif)#encapsulation dot1q 30
MEDELLIN(config-subif)#ip address 172.16.30.1 255.255.255.0
MEDELLIN(config-subif)#interface g0/0.40
MEDELLIN(config-subif)#description ADMINISTRATIVOS
MEDELLIN(config-subif)#encapsulation dot1q 40
MEDELLIN(config-subif)#ip address 172.16.40.1 255.255.255.0
MEDELLIN(config-subif)#interface g0/0.150
MEDELLIN(config-subif)#description SOPORTE
MEDELLIN(config-subif)#encapsulation dot1q 150
MEDELLIN(config-subif)#ip address 172.16.150.1 255.255.255.0
MEDELLIN(config-subif)#interface g0/0
MEDELLIN(config-if)#no shutdown

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

At the bottom of the window, there is a text prompt 'Ctrl+F6 to exit CLI focus' and two buttons labeled 'Copy' and 'Paste'.

4. En el Switch 3 deshabilitar DNS lookup

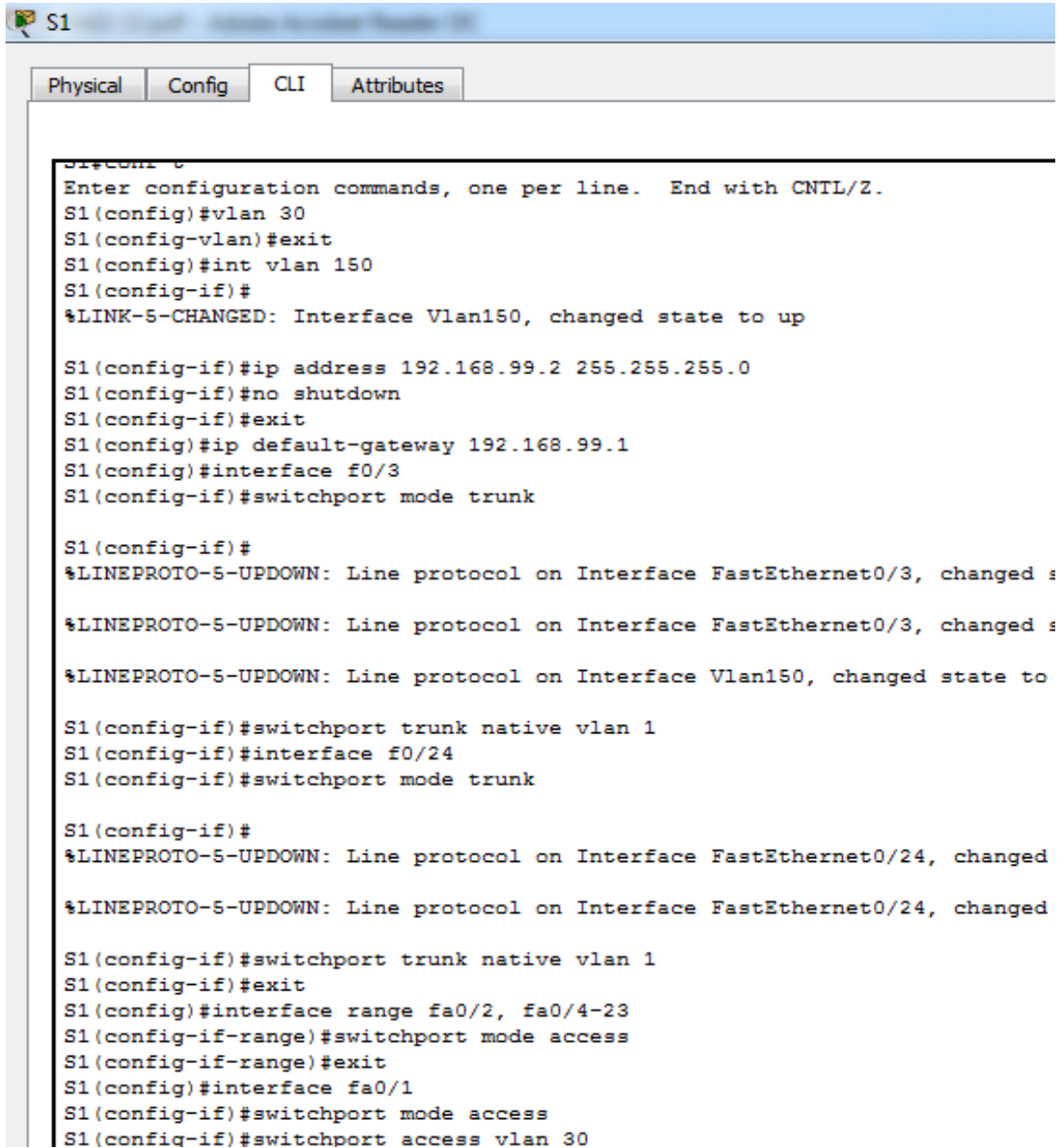


The screenshot shows a network simulator window titled 'S3'. It has four tabs: 'Physical', 'Config', 'CLI', and 'Attributes'. The 'CLI' tab is active, displaying the 'IOS Command Line Interface'. The terminal output shows the following sequence of commands and responses:

```
S3>en
S3#conf t
Enter configuration commands, one per line. End with CNTL/Z.
S3(config)#no ip domain-lookup
S3(config)#
```

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

Configuración S1



```
S1
Physical Config CLI Attributes
S1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
S1(config)#vlan 30
S1(config-vlan)#exit
S1(config)#int vlan 150
S1(config-if)#
%LINK-5-CHANGED: Interface Vlan150, changed state to up

S1(config-if)#ip address 192.168.99.2 255.255.255.0
S1(config-if)#no shutdown
S1(config-if)#exit
S1(config)#ip default-gateway 192.168.99.1
S1(config)#interface f0/3
S1(config-if)#switchport mode trunk

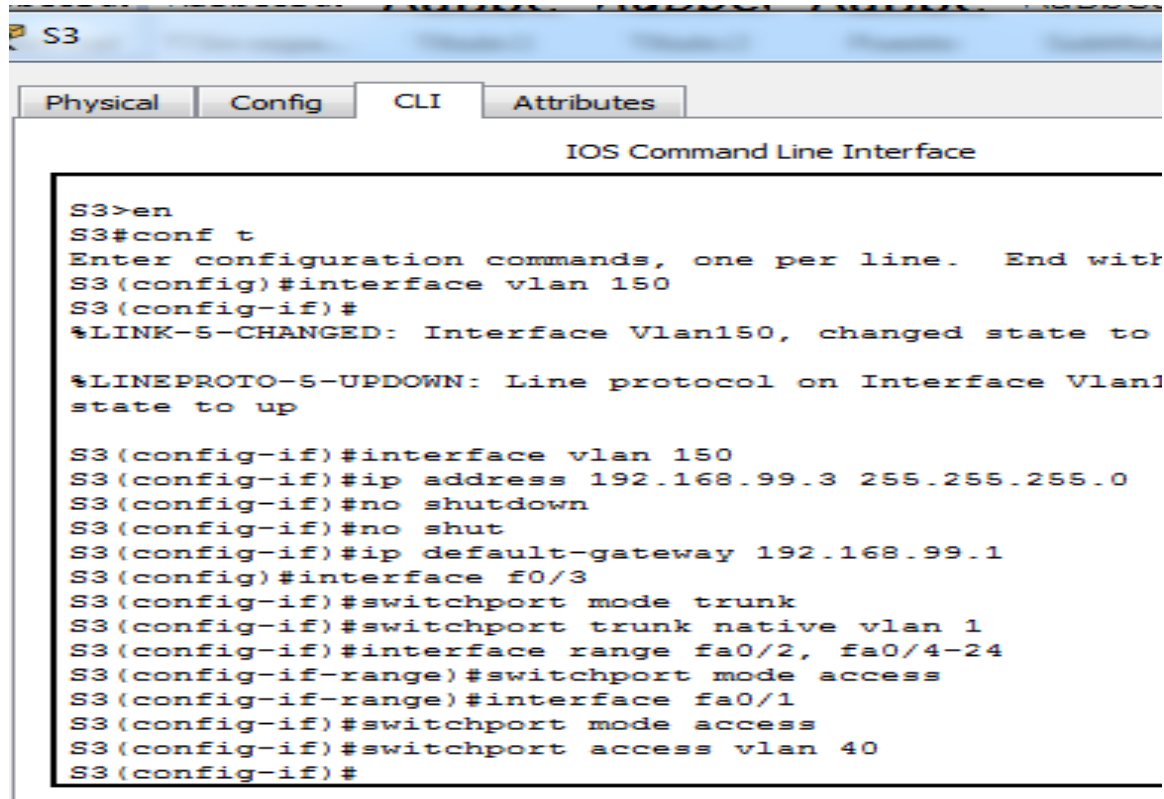
S1(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3, changed s
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3, changed s
%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan150, changed state to

S1(config-if)#switchport trunk native vlan 1
S1(config-if)#interface f0/24
S1(config-if)#switchport mode trunk

S1(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/24, changed
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/24, changed

S1(config-if)#switchport trunk native vlan 1
S1(config-if)#exit
S1(config)#interface range fa0/2, fa0/4-23
S1(config-if-range)#switchport mode access
S1(config-if-range)#exit
S1(config)#interface fa0/1
S1(config-if)#switchport mode access
S1(config-if)#switchport access vlan 30
```

Configuración s3

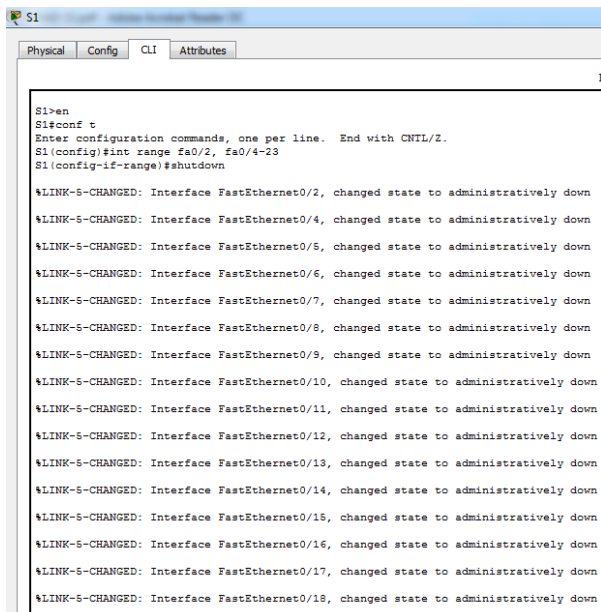


The screenshot shows the CLI interface of a switch named S3. The user enters 'en' to enter enable mode, then 'conf t' to enter configuration mode. They configure interface Vlan150 with IP address 192.168.99.3 and subnet mask 255.255.255.0, and set the default gateway to 192.168.99.1. Then, they configure interface f0/3 as a trunk port with native VLAN 1. Finally, they configure a range of interfaces from fa0/2 to fa0/24 as access ports, with fa0/1 specifically configured as an access port in VLAN 40.

```
S3>en
S3#conf t
Enter configuration commands, one per line. End with
S3(config)#interface vlan 150
S3(config-if)#
%LINK-5-CHANGED: Interface Vlan150, changed state to
%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan1
state to up

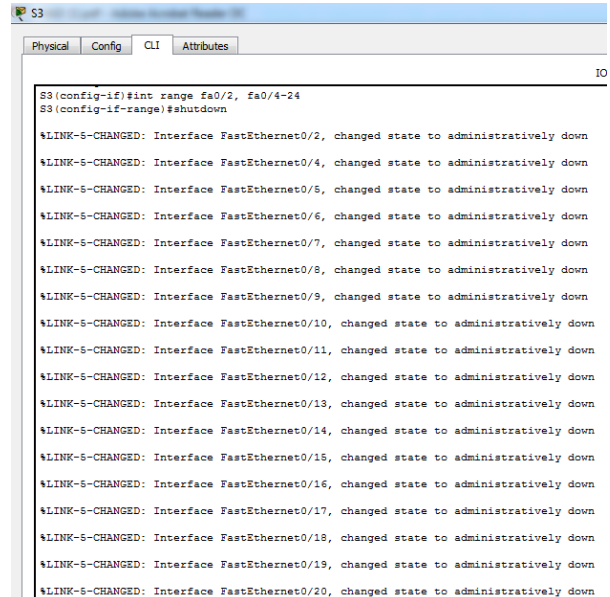
S3(config-if)#interface vlan 150
S3(config-if)#ip address 192.168.99.3 255.255.255.0
S3(config-if)#no shutdown
S3(config-if)#no shut
S3(config-if)#ip default-gateway 192.168.99.1
S3(config)#interface f0/3
S3(config-if)#switchport mode trunk
S3(config-if)#switchport trunk native vlan 1
S3(config-if)#interface range fa0/2, fa0/4-24
S3(config-if-range)#switchport mode access
S3(config-if-range)#interface fa0/1
S3(config-if)#switchport mode access
S3(config-if)#switchport access vlan 40
S3(config-if)#
```

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



The screenshot shows the CLI interface of a switch named S1. The user enters 'en' to enter enable mode, then 'conf t' to enter configuration mode. They configure a range of interfaces from fa0/2 to fa0/23 to be administratively down.

```
S1>en
S1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
S1(config)#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 FastEthernet0/4, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/5, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/6, changed state to administratively down
%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 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
```



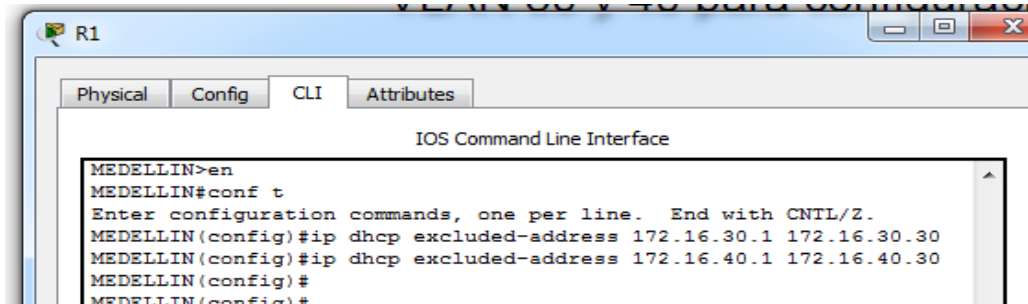
The screenshot shows the CLI interface of a switch named S3. The user enters 'en' to enter enable mode, then 'conf t' to enter configuration mode. They configure a range of interfaces from fa0/2 to fa0/24 to be administratively down.

```
S3>en
S3#conf t
Enter configuration commands, one per line. End with CNTL/Z.
S3(config)#int range fa0/2, fa0/4-24
S3(config-if-range)#shutdown
%LINK-5-CHANGED: Interface FastEthernet0/2, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/4, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/5, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/6, changed state to administratively down
%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 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
```


7. Implement DHCP and NAT for IPv4

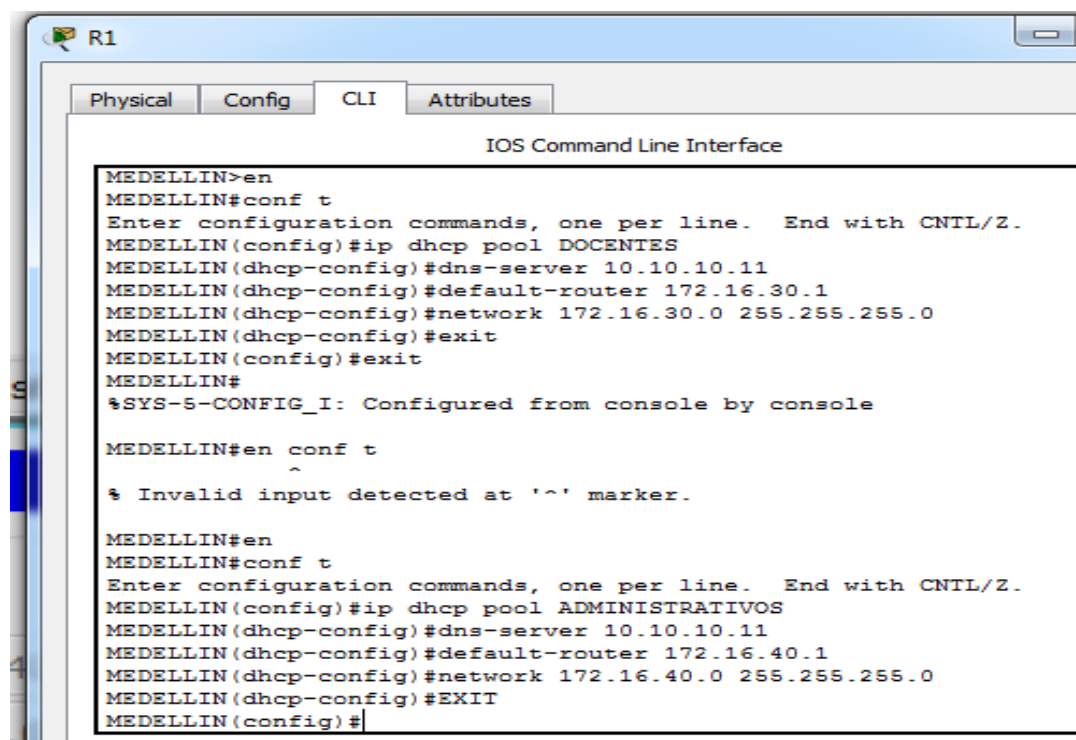
8. Configurar R1 como servidor DHCP para las VLANs 30 y 40.

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



```
MEDELLIN>en
MEDELLIN#conf t
Enter configuration commands, one per line. End with CNTL/Z.
MEDELLIN(config)#ip dhcp excluded-address 172.16.30.1 172.16.30.30
MEDELLIN(config)#ip dhcp excluded-address 172.16.40.1 172.16.40.30
MEDELLIN(config)#
MEDELLIN(config)#
```

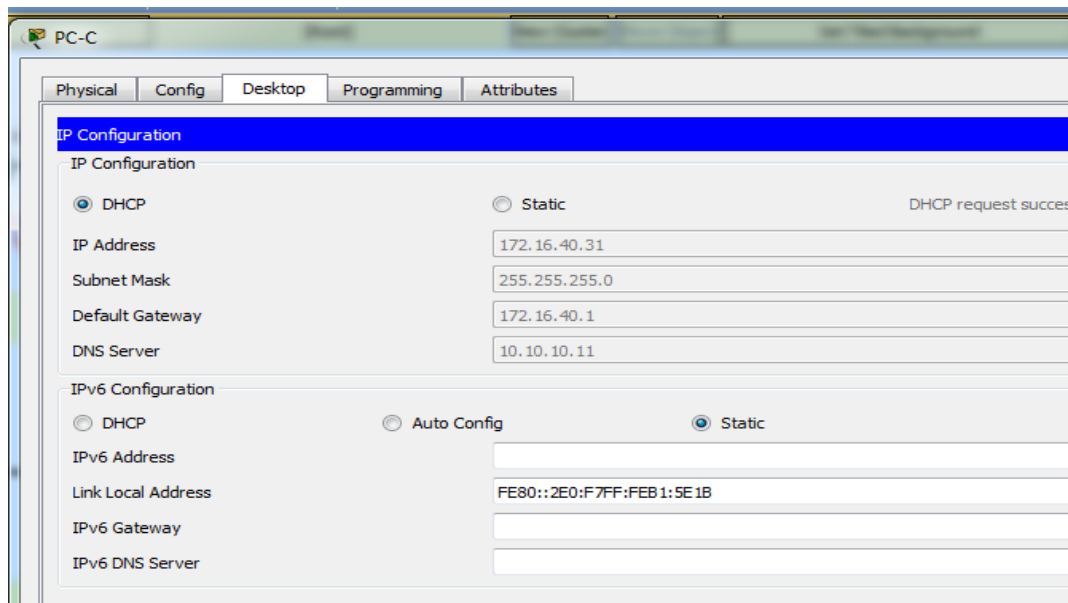
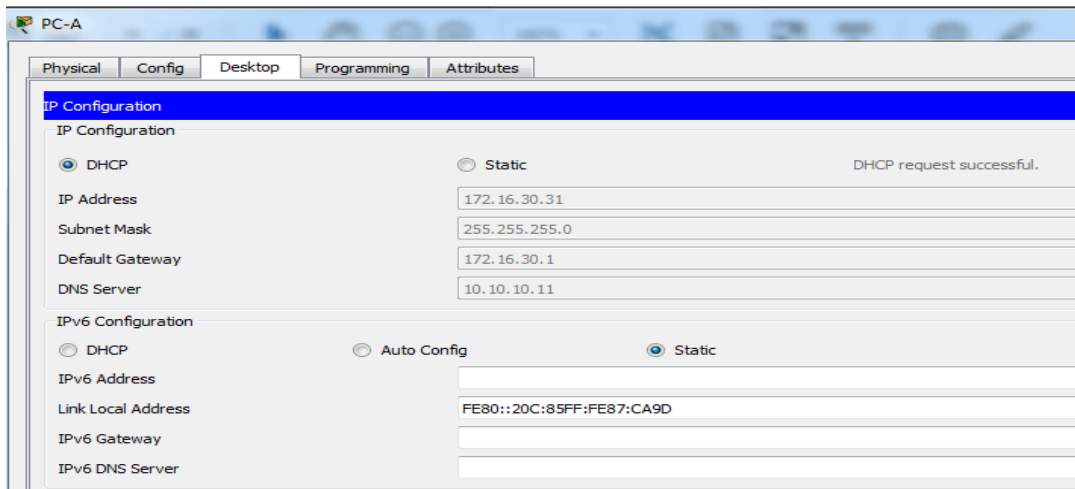
Configurar DHCP pool para VLAN 30	Name: DOCENTES DNS-Server: 10.10.10.11 Domain-Name: ccna-unad.com Establecer default gateway.
Configurar DHCP pool para VLAN 40	Name: ADMINISTRATIVOS DNS-Server: 10.10.10.11 Domain-Name: ccna-unad.com Establecer default gateway.



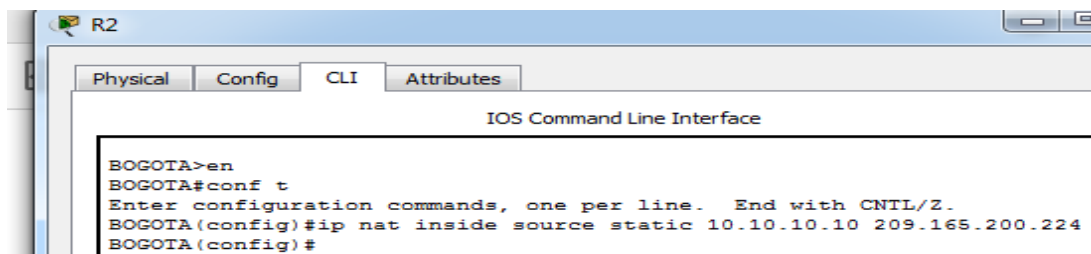
```
MEDELLIN>en
MEDELLIN#conf t
Enter configuration commands, one per line. End with CNTL/Z.
MEDELLIN(config)#ip dhcp pool DOCENTES
MEDELLIN(dhcp-config)#dns-server 10.10.10.11
MEDELLIN(dhcp-config)#default-router 172.16.30.1
MEDELLIN(dhcp-config)#network 172.16.30.0 255.255.255.0
MEDELLIN(dhcp-config)#exit
MEDELLIN(config)#exit
MEDELLIN#
%SYS-5-CONFIG_I: Configured from console by console

MEDELLIN#en conf t
^
% Invalid input detected at '^' marker.

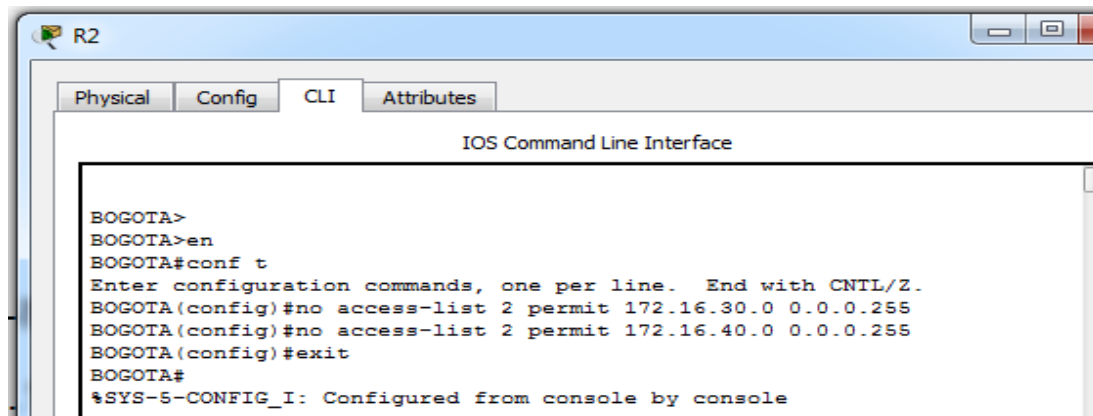
MEDELLIN#en
MEDELLIN#conf t
Enter configuration commands, one per line. End with CNTL/Z.
MEDELLIN(config)#ip dhcp pool ADMINISTRATIVOS
MEDELLIN(dhcp-config)#dns-server 10.10.10.11
MEDELLIN(dhcp-config)#default-router 172.16.40.1
MEDELLIN(dhcp-config)#network 172.16.40.0 255.255.255.0
MEDELLIN(dhcp-config)#EXIT
MEDELLIN(config)#
```



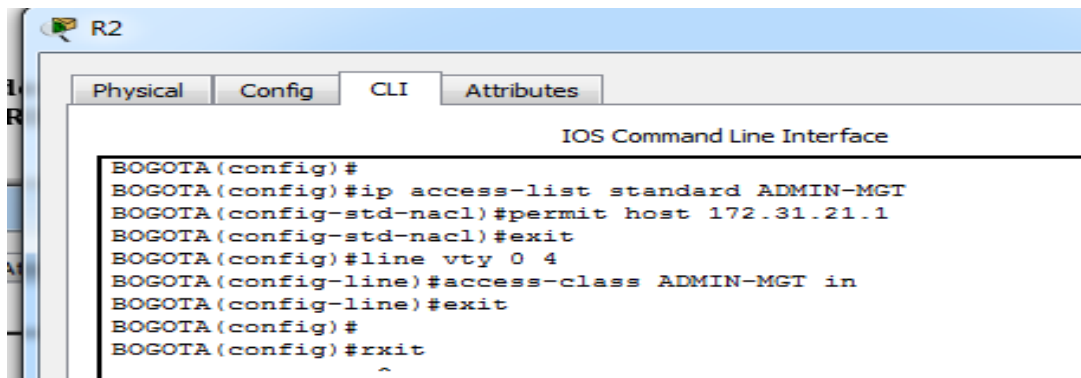
10. Configurar NAT en R2 para permitir que los host puedan salir a internet



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.

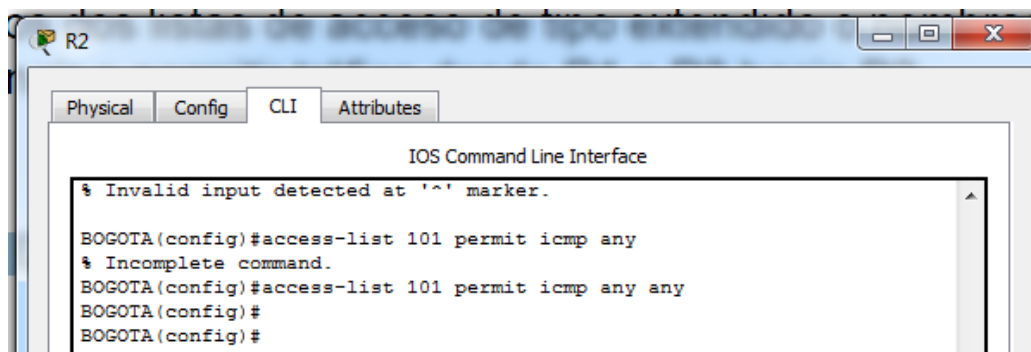


```
BOGOTA>
BOGOTA>en
BOGOTA#conf t
Enter configuration commands, one per line. End with CNTL/Z.
BOGOTA(config)#no access-list 2 permit 172.16.30.0 0.0.0.255
BOGOTA(config)#no access-list 2 permit 172.16.40.0 0.0.0.255
BOGOTA(config)#exit
BOGOTA#
%SYS-5-CONFIG_I: Configured from console by console
```



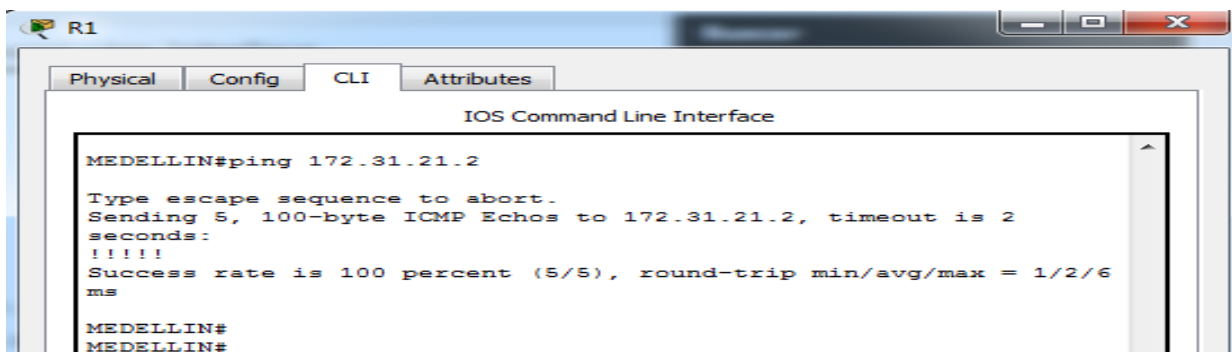
```
BOGOTA(config)#
BOGOTA(config)#ip access-list standard ADMIN-MGT
BOGOTA(config-std-nacl)#permit host 172.31.21.1
BOGOTA(config-std-nacl)#exit
BOGOTA(config)#line vty 0 4
BOGOTA(config-line)#access-class ADMIN-MGT in
BOGOTA(config-line)#exit
BOGOTA(config)#
BOGOTA(config)#rxit
```

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.



```
% Invalid input detected at '^' marker.
BOGOTA(config)#access-list 101 permit icmp any
% Incomplete command.
BOGOTA(config)#access-list 101 permit icmp any any
BOGOTA(config)#
BOGOTA(config)#
```

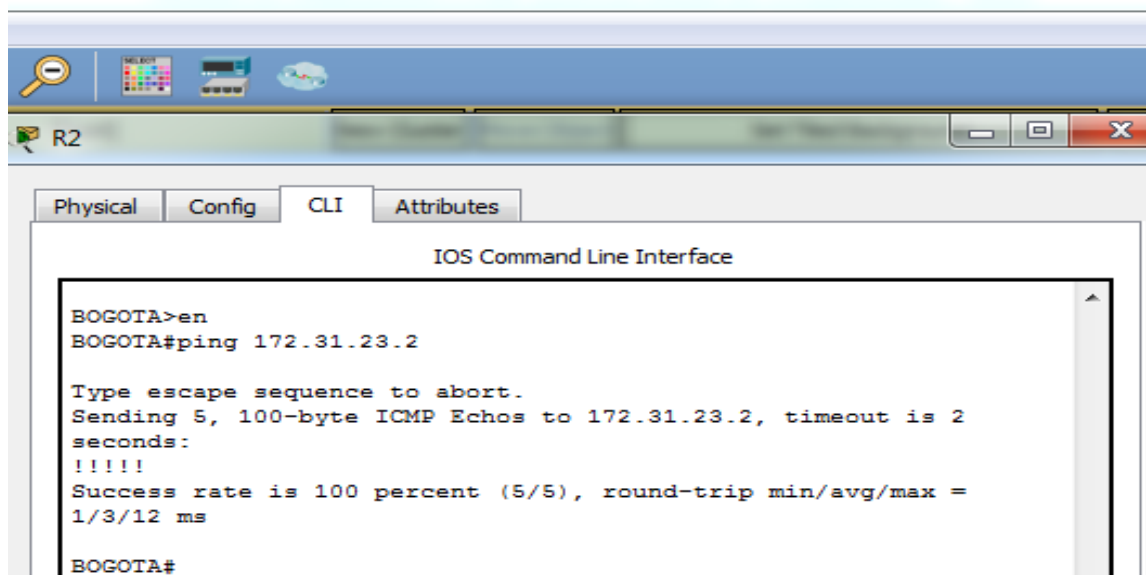
13. Verificar procesos de comunicación y redireccionamiento de tráfico en los routers mediante el uso de Ping y Traceroute.



```
R1
Physical Config CLI Attributes
IOS Command Line Interface
MEDELLIN#ping 172.31.21.2
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 172.31.21.2, timeout is 2
seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/2/6
ms
MEDELLIN#
MEDELLIN#
```

```
MEDELLIN>en
MEDELLIN#PING 172.31.23.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 172.31.23.1, timeout is 2
seconds:
.....
Success rate is 0 percent (0/5)
```



```
R2
Physical Config CLI Attributes
IOS Command Line Interface
BOGOTA>en
BOGOTA#ping 172.31.23.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 172.31.23.2, timeout is 2
seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max =
1/3/12 ms
BOGOTA#
```

Cisco Packet Tracer - C:\Users\hp\Downloads\PRACTICA.pkt

File Edit Options View Tools Extensions Help

Logical Back [Root] New Cluster Move Object Set Tiled Background Viewport Environment: 00:18:00

209.165.200.230 Internet PC
209.165.200.224/29
1941 R2 DCE
Server-PT WEBSERVER 10.10.10.10/32
172.31.21.0/30 DCE
OSPF AREA 0
MEDELLÍN 41
172.31.23.0/30 B/MANGA R3
Lo4 192.168.4.0/24
Lo5 192.168.5.0/24
Lo6 192.168.6.0/24
CRISTHIAN QUISPI
UNAD CEAD YOPAL
192.168.99.2 1964-24TT 51
2960-24TT 38 192.168.99.3
DHCP PC-A
DHCP PC-C

VLAN	DIRECCIONAMIENTO	NOMBRE
30	172.16.30.0/24	DOCENTES
40	172.16.40.0/24	ADMINISTRATIVOS
150	172.16.150.0/24	SOPORTE

Time: 00:00:37 Power Cycle Devices Fast Forward Time Realtime

1941 2901 2911 8191CX 8194CW 829 1240 4321 Generic Generic 1841 2620M 2621M 2811

(Select a Device to Drag and Drop to the Workspace)

ES 02:06 p.m. 07/07/2018

CONCLUSIONES

- Se configura exitosamente la topología de red sugerida en la prueba de habilidades, aplicando los conocimientos y habilidades adquiridas en el Diplomado.
- El desarrollo de manera organizada permite disminuir errores durante la configuración de la red.
- Con la configuración de DHCP facilita la administración de las direcciones IP y ahorro de tiempo ya que no toca asignar direccionamiento individual pues. Si DHCP está activo, el servidor DHCP administra y asigna las direcciones IP sin necesidad de que intervenga el administrador. Los clientes pueden moverse a otras subredes sin necesidad de reconfiguración manual, ya que obtienen del servidor DHCP la nueva información de cliente necesaria para la nueva red.
- Mediante la configuración de las listas de acceso, permite o deniega el acceso de hosts a algunos recursos ofrecidos en red.
- Existe diferentes formas de configuraciones que permiten toda la administración remota de cada uno de los dispositivos del modo usuario, privilegiado y global.
- Se utilizó la herramienta de simulación Cisco Packet Tracer, como medio para desarrollar la práctica con ello la seguridad y sin temor a equivocarnos de realizar implementaciones en la vida real de este o cualquier otra red que surja como solución tecnológica a una necesidad.

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