

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

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**Diplomado de profundización CISCO**

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## INTRODUCCION

El siguiente trabajo corresponde a la “Prueba de habilidades prácticas”, forma parte de las actividades evaluativas del Diplomado de Profundización CCNA, la cual busca identificar el grado de desarrollo de competencias y habilidades que fueron adquiridas a lo largo del diplomado y a través de la cual se pondrá a prueba los niveles de comprensión y solución de problemas relacionados con diversos aspectos de Networking.

Para esta actividad, se desarrolla un escenario propuesto acompañado 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.

## OBJETIVOS

### GENERAL

Identificar el grado de desarrollo de competencias y habilidades que fueron adquiridas a lo largo del diplomado y a través de la comprensión y solución de problemas relacionados con diversos aspectos de Networking

### ESPECÍFICOS

Identificar y configurar enrutamiento estático, enrutamiento dinámico, enrutamiento mediante protocolos de estado enlace, listas de acceso, asignación dinámica de direcciones IP y traducciones de direcciones IP mediante NAT.

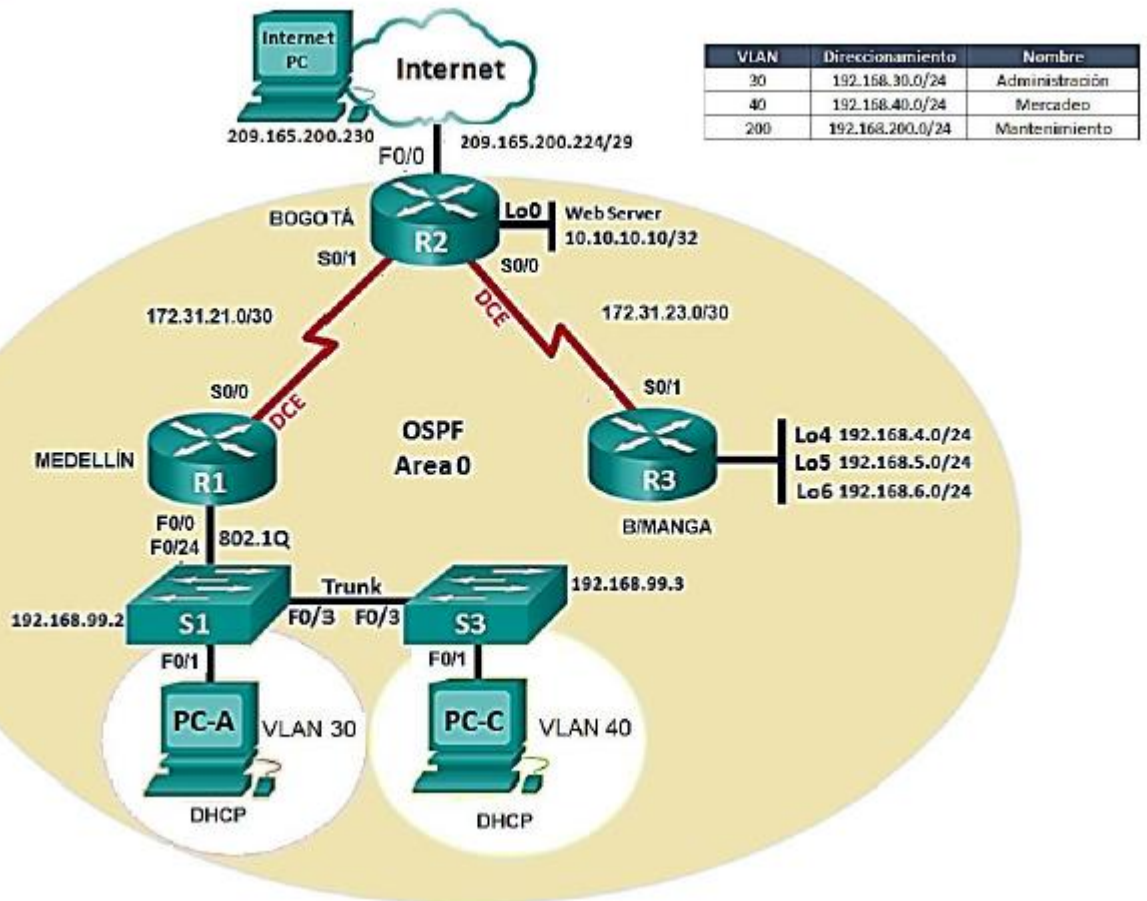
Documentar la solución del escenario propuesto soportado en el uso de dispositivos de conmutación acorde con las topologías de red establecida en la guía de habilidades practicas

## Descripción del escenario propuesto para la prueba de habilidades

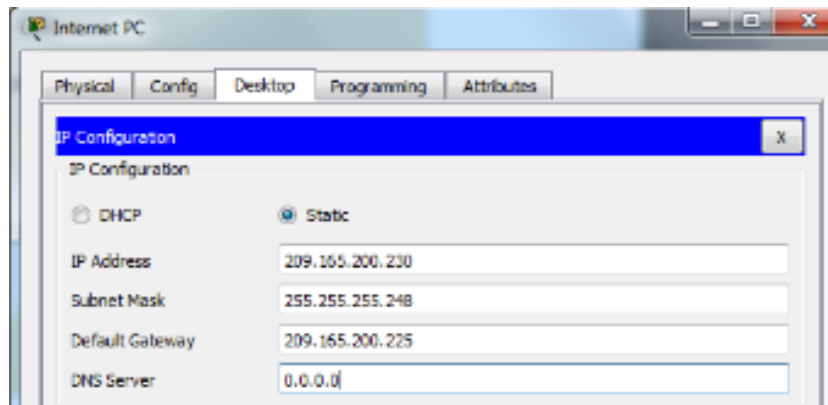
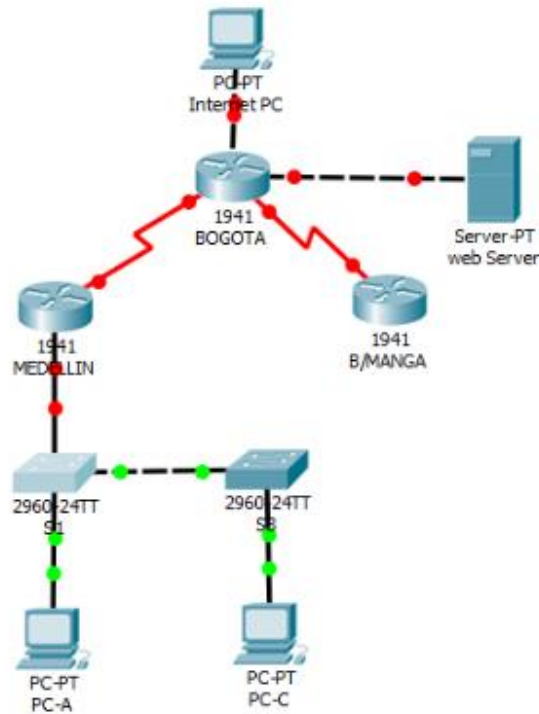
### 1.1 Escenario

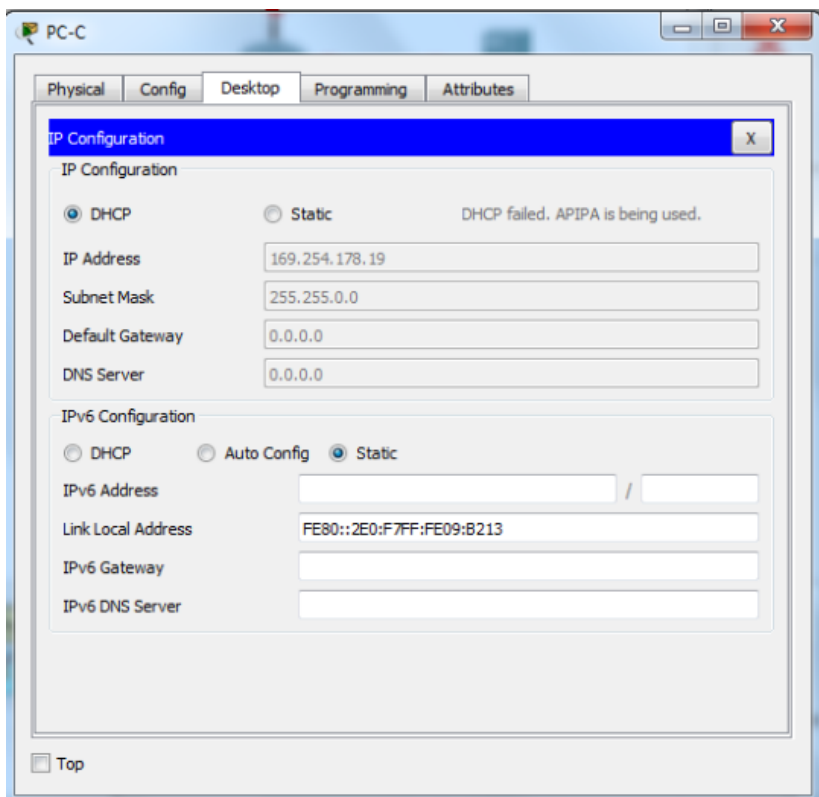
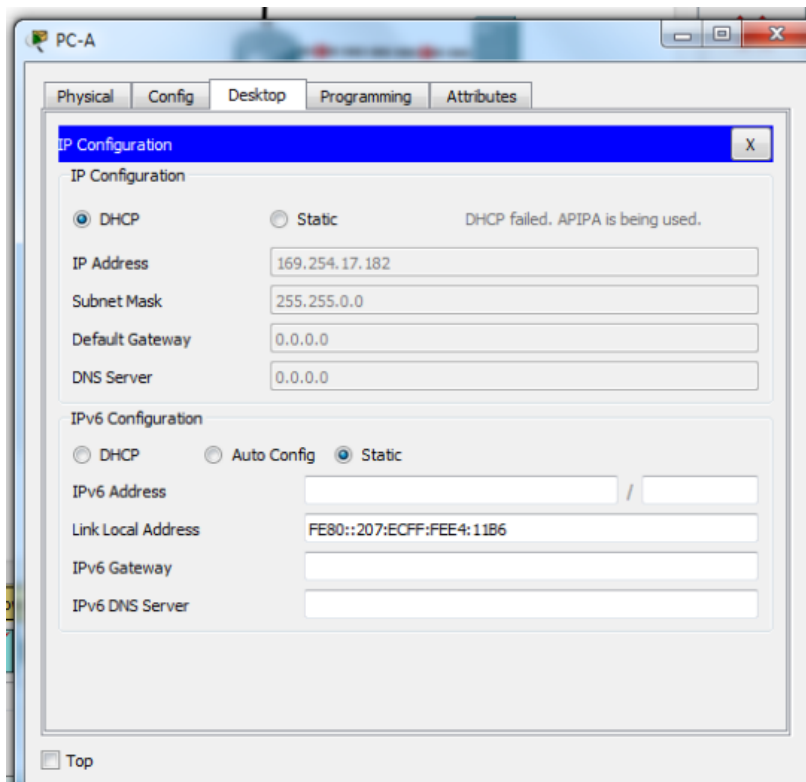
Una empresa de Tecnología posee tres sucursales distribuidas en las ciudades de Bogotá, Medellín y Bucaramanga, en donde el estudiante será el administrador de la red, el cual deberá configurar e interconectar entre sí cada uno de los dispositivos que forman parte del escenario, acorde con los lineamientos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

### TOPOLOGIA



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







```
Router>en
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#no ip domain-lookup
Router(config)#hostname R1
R1(config)#int s0/0/0
R1(config-if)#description connetion to 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

%LINK-5-CHANGED: Interface Serial0/0/0, changed state to down
R1(config-if)#
```

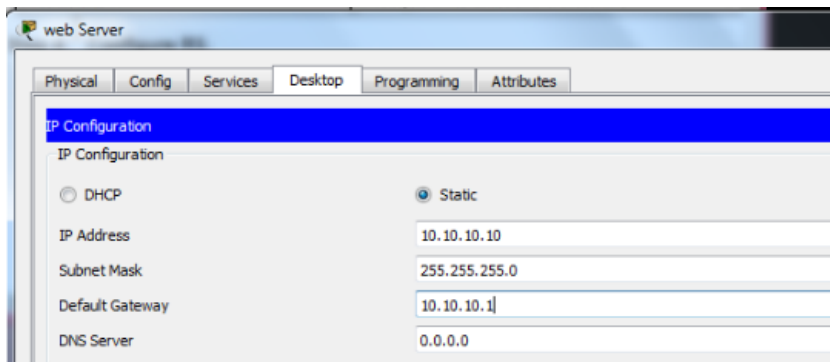
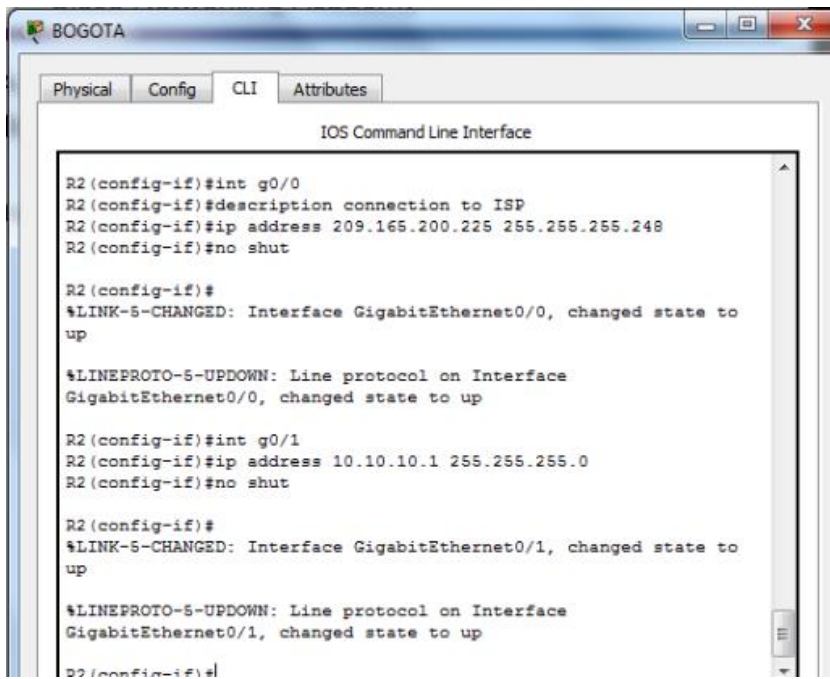
The screenshot shows a window titled "BOGOTA" with tabs for "Physical", "Config", "CLI", and "Attributes". The "CLI" tab is active, displaying the "IOS Command Line Interface" with the following text:

```
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#no ip domain-lookup
Router(config)#hostname R2
R2(config)#int s0/0/0
R2(config-if)#description connection to R1
R2(config-if)#ip address 172.31.21.2 255.255.255.252
R2(config-if)#no shutdown

%LINK-5-CHANGED: Interface Serial0/0/0, changed state to down
R2(config-if)#no shutdown
R2(config-if)#int s0/0/1
R2(config-if)#description connection to R3
R2(config-if)#ip address 172.31.21.2 255.255.255.252
% 172.31.21.0 overlaps with Serial0/0/0
R2(config-if)#ip address 172.31.23.2 255.255.255.252
R2(config-if)#clock rate 128000
This command applies only to DCE interfaces
R2(config-if)#no shut

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
```



B/MANGA

Physical Config CLI Attributes

IOS Command Line Interface

```
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#no ip domain-lookup
Router(config)#hostname R3
R3(config)#int s0/0/1
R3(config-if)#description connection to R2
^
% Invalid input detected at '^' marker.

R3(config-if)#description connection to R2
R3(config-if)#ip address 172.31.23.2 255.255.255.252
R3(config-if)#no shut

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)#
```

B/MANGA

Physical Config CLI Attributes

IOS Command Line Interface

```
%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 shut
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 shut
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
ip address 192.168.6.1 255.255.255.0
R3(config-if)#
```

### 1.3 Configurar el protocolo de enrutamiento OSPFv2 bajo los siguientes criterios:

SPFv2 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

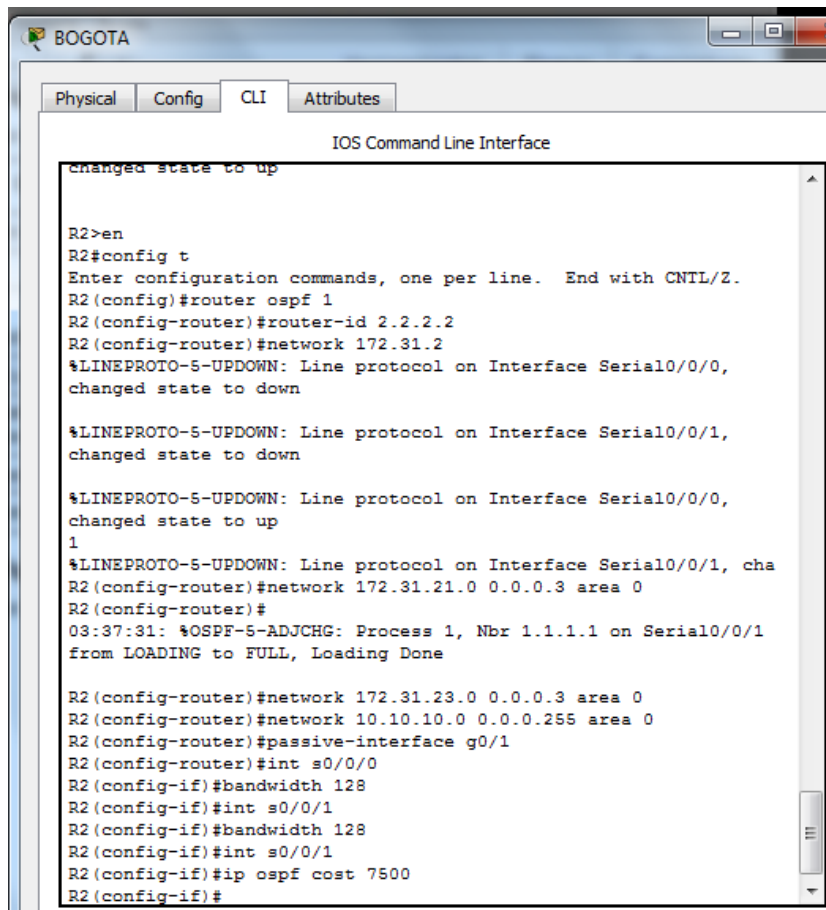
```
R1>en
R1#config t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#router ospf1
      ^
% Invalid input detected at '^' marker.

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)#network 192.168.200.0 0.0.0.255 area 0
```

```
R1(config-router)#passive-interface g0/0.30
R1(config-router)#passive-interface g0/0.40
R1(config-router)#passive-interface g0/0.200
R1(config-router)#
```

```
R1(config-router)#exit
R1(config)#int s0/0/0
R1(config-if)#bandwidth 128
R1(config-if)#ip ospf cost 7500
R1(config-if)#
```

## Ahora configuramos OSPF en R2



```
changed state to up

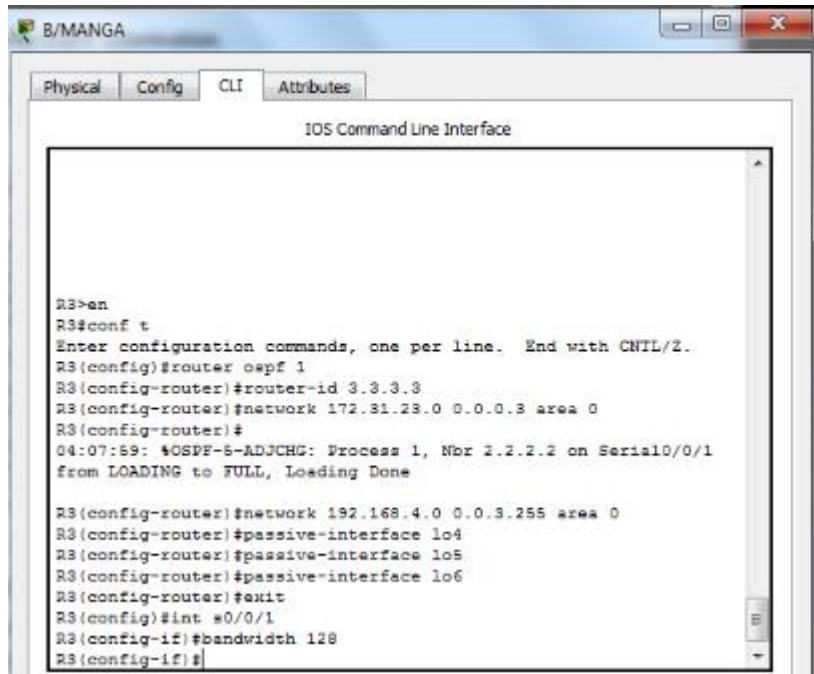
R2>en
R2#config t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#router ospf 1
R2(config-router)#router-id 2.2.2.2
R2(config-router)#network 172.31.2
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0,
changed state to down

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

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0,
changed state to up
1
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/1, cha
R2(config-router)#network 172.31.21.0 0.0.0.3 area 0
R2(config-router)#
03:37:31: %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 10.10.10.0 0.0.0.255 area 0
R2(config-router)#passive-interface g0/1
R2(config-router)#int s0/0/0
R2(config-if)#bandwidth 128
R2(config-if)#int s0/0/1
R2(config-if)#bandwidth 128
R2(config-if)#int s0/0/1
R2(config-if)#ip ospf cost 7500
R2(config-if)#
```

## OSPF en R3



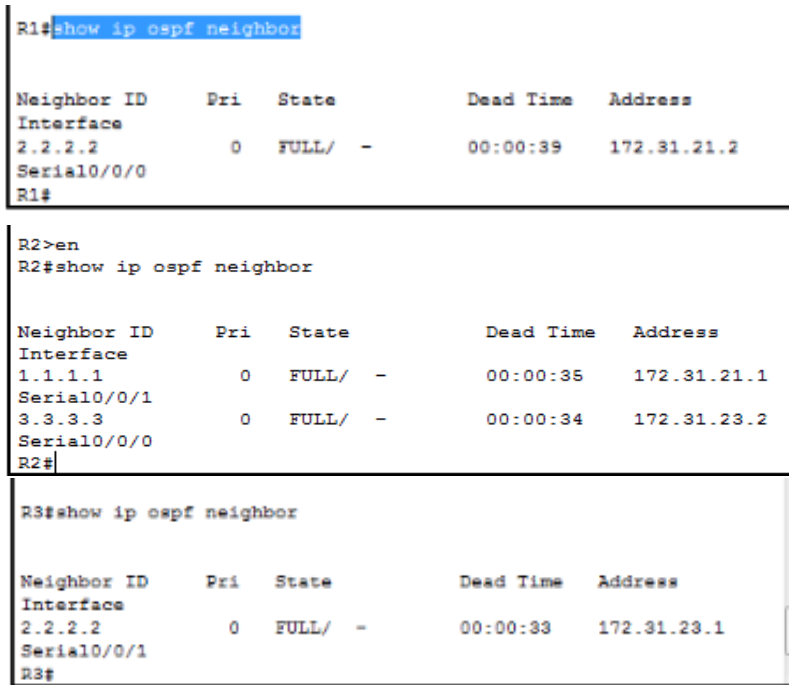
```
B/MANGA
Physical Config CLI Attributes
IOS Command Line Interface

R3>en
R3#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R3(config)#router ospf 1
R3(config-router)#router-id 3.3.3.3
R3(config-router)#network 172.31.23.0 0.0.0.3 area 0
R3(config-router)#
04:07:59: %OSPF-6-ADJCHG: Process 1, Nbr 2.2.2.2 on Serial0/0/1
from LOADING to FULL, Loading Done

R3(config-router)#network 192.168.4.0 0.0.3.255 area 0
R3(config-router)#passive-interface lo4
R3(config-router)#passive-interface lo5
R3(config-router)#passive-interface lo6
R3(config-router)#exit
R3(config)#int #0/0/1
R3(config-if)#bandwidth 128
R3(config-if)#
```

## Verificar información de OSPF

- Visualizar tablas de enrutamiento y routers conectados por OSPFv2



```
R1#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
R1#

R2>en
R2#show ip ospf neighbor

Neighbor ID    Pri   State           Dead Time   Address
Interface
1.1.1.1        0     FULL/ -         00:00:35   172.31.21.1
Serial0/0/1
3.3.3.3        0     FULL/ -         00:00:34   172.31.23.2
Serial0/0/0
R2#

R3#show ip ospf neighbor

Neighbor ID    Pri   State           Dead Time   Address
Interface
2.2.2.2        0     FULL/ -         00:00:33   172.31.23.1
Serial0/0/1
R3#
```

```
R1#show ip route ospf
 10.0.0.0/24 is subnetted, 1 subnets
O   10.10.10.0 [110/7501] via 172.31.21.2, 01:00:09,
Serial0/0/0
 172.31.0.0/16 is variably subnetted, 3 subnets, 2 masks
O   172.31.23.0 [110/15000] via 172.31.21.2, 00:12:58,
Serial0/0/0
 192.168.4.0/32 is subnetted, 1 subnets
O   192.168.4.1 [110/15001] via 172.31.21.2, 00:12:58,
Serial0/0/0
 192.168.5.0/32 is subnetted, 1 subnets
O   192.168.5.1 [110/15001] via 172.31.21.2, 00:12:58,
Serial0/0/0
 192.168.6.0/32 is subnetted, 1 subnets
O   192.168.6.1 [110/15001] via 172.31.21.2, 00:12:58,
Serial0/0/0
```

R1#

```
R2#
R2#show ip route ospf
 192.168.4.0/32 is subnetted, 1 subnets
O   192.168.4.1 [110/7501] via 172.31.23.2, 00:14:12,
Serial0/0/0
 192.168.5.0/32 is subnetted, 1 subnets
O   192.168.5.1 [110/7501] via 172.31.23.2, 00:14:12,
Serial0/0/0
 192.168.6.0/32 is subnetted, 1 subnets
O   192.168.6.1 [110/7501] via 172.31.23.2, 00:14:12,
Serial0/0/0
O   192.168.30.0 [110/7501] via 172.31.21.1, 00:50:51,
Serial0/0/1
O   192.168.40.0 [110/7501] via 172.31.21.1, 00:50:51,
Serial0/0/1
O   192.168.99.0 [110/7501] via 172.31.21.1, 00:50:51,
Serial0/0/1
O   192.168.200.0 [110/7501] via 172.31.21.1, 00:50:51,
Serial0/0/1
```

R2#

```
R3#show ip route ospf
 10.0.0.0/24 is subnetted, 1 subnets
O   10.10.10.0 [110/782] via 172.31.23.1, 00:29:41,
Serial0/0/1
 172.31.0.0/16 is variably subnetted, 3 subnets, 2 masks
O   172.31.21.0 [110/8281] via 172.31.23.1, 00:29:41,
Serial0/0/1
O   192.168.30.0 [110/8282] via 172.31.23.1, 00:29:41,
Serial0/0/1
O   192.168.40.0 [110/8282] via 172.31.23.1, 00:29:41,
Serial0/0/1
O   192.168.99.0 [110/8282] via 172.31.23.1, 00:29:41,
Serial0/0/1
O   192.168.200.0 [110/8282] via 172.31.23.1, 00:29:41,
Serial0/0/1
```

R3#

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

The screenshot shows a Cisco IOS Command Line Interface window titled 'MEDELLIN'. The window has tabs for 'Physical', 'Config', 'CLI', and 'Attributes', with 'CLI' selected. The main content area displays the output of the command 'R1#show ip ospf neighbor' and 'R1#show ip ospf interface'.

```

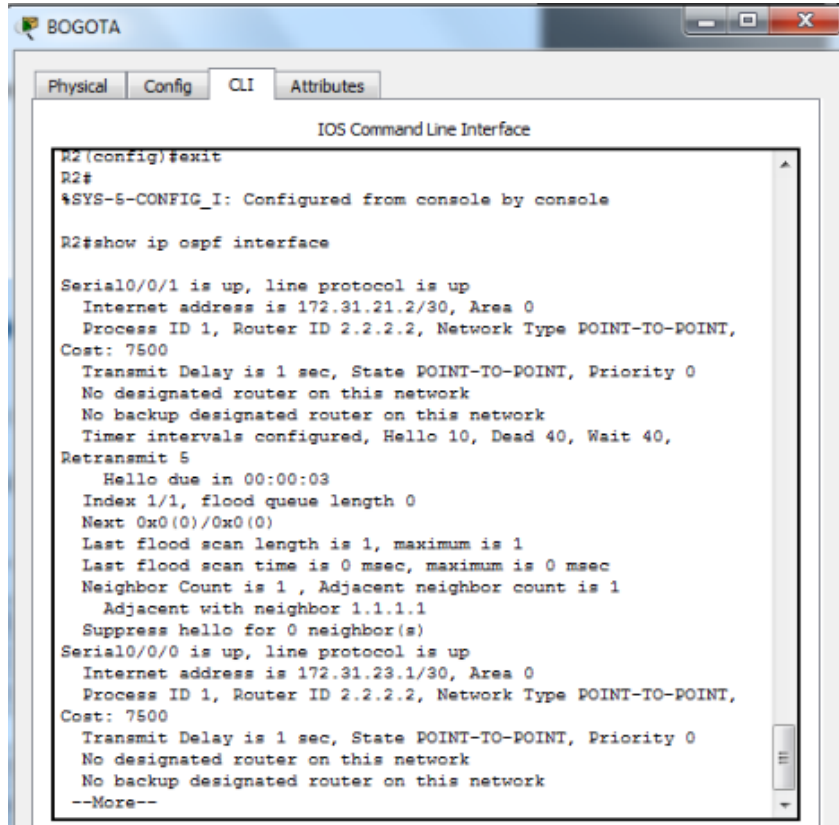
R1#show ip ospf neighbor

Neighbor ID      Pri   State           Dead Time   Address
Interface
2.2.2.2          0    FULL/ -         00:00:39   172.31.21.2
Serial0/0/0
R1#show ip ospf interface

GigabitEthernet0/0.30 is up, line protocol is up
  Internet address is 192.168.30.1/24, Area 0
  Process ID 1, Router ID 1.1.1.1, Network Type BROADCAST, Cost:
  1
  Transmit Delay is 1 sec, State WAITING, Priority 1
  No designated router on this network
  No backup designated router on this network
  Timer intervals configured, Hello 10, Dead 40, Wait 40,
  Retransmit 5
  No Hellos (Passive interface)
  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 0, Adjacent neighbor count is 0
  Suppress hello for 0 neighbor(s)
GigabitEthernet0/0.40 is up, line protocol is up
  Internet address is 192.168.40.1/24, Area 0
  Process ID 1, Router ID 1.1.1.1, Network Type BROADCAST, Cost:
  1
  Transmit Delay is 1 sec, State WAITING, Priority 1
  No designated router on this network
  No backup designated router on this network
  Timer intervals configured, Hello 10, Dead 40, Wait 40,
  Retransmit 5
--More--

```



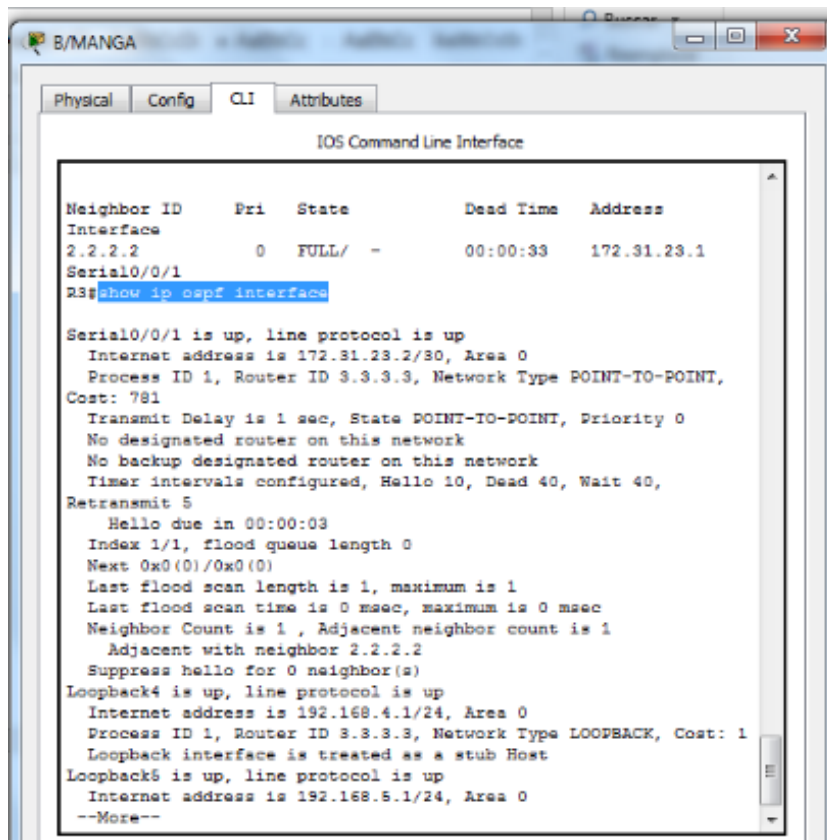


The screenshot shows a window titled "BOGOTA" with a tabbed interface. The "CLI" tab is active, displaying the "IOS Command Line Interface". The terminal output shows the following commands and their results:

```
R2(config)#exit
R2#
%SYS-5-CONFIG_I: Configured from console by console

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 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 00:00:03
  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 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
--More--
```



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

```

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
    192.168.99.0 0.0.0.255 area 0
  Passive Interface(s):
    GigabitEthernet0/0.30
    GigabitEthernet0/0.40
    GigabitEthernet0/0.200
    GigabitEthernet0/0.99
  Routing Information Sources:
    Gateway         Distance      Last Update
    1.1.1.1           110          00:24:58
    2.2.2.2           110          00:04:48
    3.3.3.3           110          00:19:20
  Distance: (default is 110)

R1#

```

IOS Command Line Interface

```

Transmit Delay is 1 sec, State POINT-TO-POINT, Priority 0
No designated router on this network
No backup designated router on this network

R2#show ip protocols
^
% Invalid input detected at '^' marker.

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 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):
    GigabitEthernet0/1
  Routing Information Sources:
    Gateway         Distance      Last Update
    1.1.1.1           110          00:27:17
    2.2.2.2           110          00:07:08
    3.3.3.3           110          00:21:39
  Distance: (default is 110)

R2#
R2#

```

IOS Command Line Interface

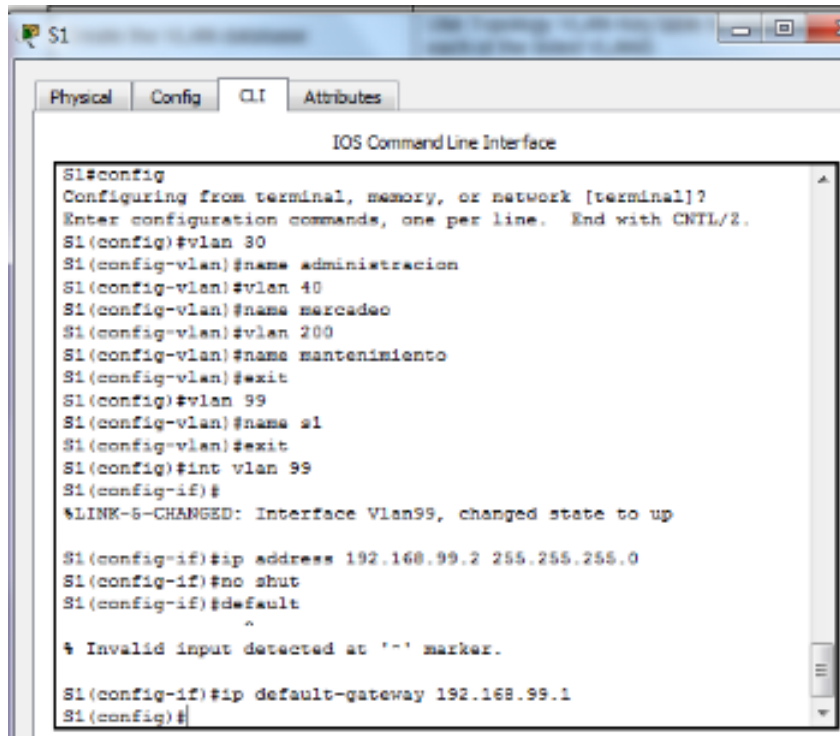
```
Adjacent with neighbor 2.2.2.2
Suppress hello for 0 neighbor(s)
Loopback4 is up, line protocol is up
Internet address is 192.168.4.1/24, Area 0
Process ID 1, Router ID 3.3.3.3, Network Type LOOPBACK, Cost: 1
Loopback interface is treated as a stub Host
Loopback5 is up, line protocol is up
Internet address is 192.168.5.1/24, Area 0

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 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 0.0.3.255 area 0
  Passive Interface(s):
    Loopback4
    Loopback5
    Loopback6
  Routing Information Sources:
    Gateway         Distance      Last Update
    1.1.1.1          110          00:29:21
    2.2.2.2          110          00:09:12
    3.3.3.3          110          00:23:43
  Distance: (default is 110)

R3#
```

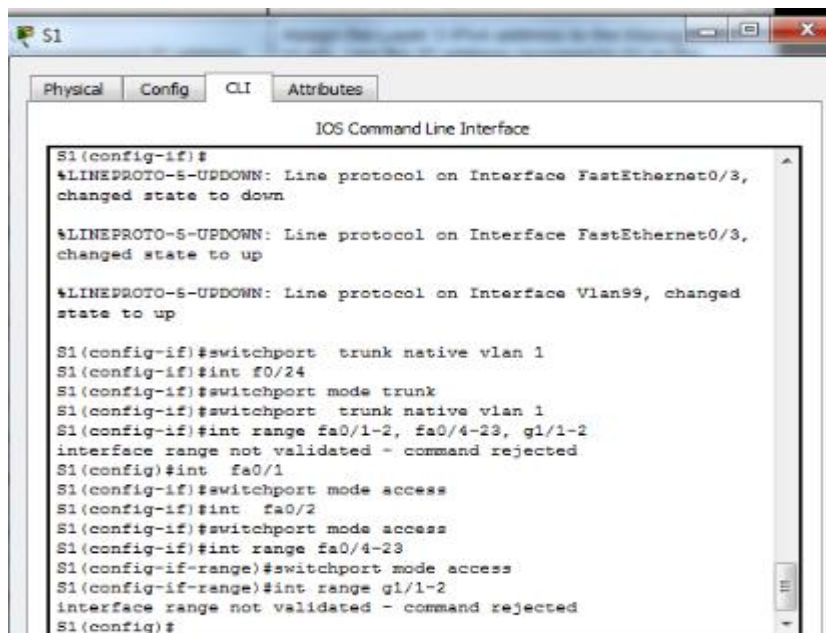
## 1.4 Configurar VLANs, Puertos troncales, puertos de acceso, encapsulamiento, Inter-VLAN Routing y Seguridad en los Switches acorde a la topología de red establecida.



```
S1#config
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
S1(config)#vlan 30
S1(config-vlan)#name administracion
S1(config-vlan)#vlan 40
S1(config-vlan)#name mercadeo
S1(config-vlan)#vlan 200
S1(config-vlan)#name mantenimiento
S1(config-vlan)#exit
S1(config)#vlan 99
S1(config-vlan)#name s1
S1(config-vlan)#exit
S1(config)#int vlan 99
S1(config-if)#
%LINK-5-CHANGED: Interface Vlan99, changed state to up

S1(config-if)#ip address 192.168.99.2 255.255.255.0
S1(config-if)#no shut
S1(config-if)#default
^
% Invalid input detected at '^' marker.

S1(config-if)#ip default-gateway 192.168.99.1
S1(config)#
```



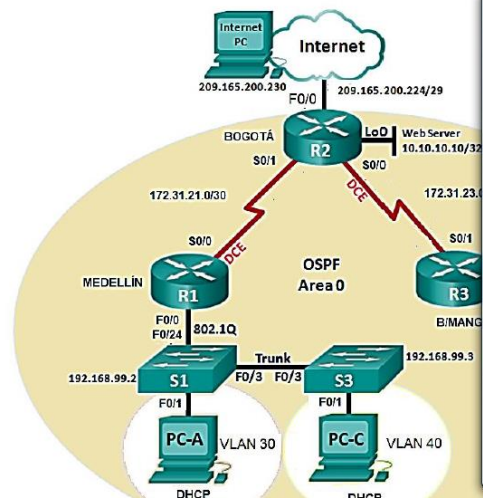
```
S1(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3,
changed state to down

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

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan99, 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 fa0/1
S1(config-if)#switchport mode access
S1(config-if)#int fa0/2
S1(config-if)#switchport mode access
S1(config-if)#int range fa0/4-23
S1(config-if-range)#switchport mode access
S1(config-if-range)#int range g1/1-2
interface range not validated - command rejected
S1(config)#
```

Topología de red



```

IOS Command Line Interface

changed state to up

S3>en
S3#config t
Enter configuration commands, one per line. End with CTRL/Z.
S3(config)#
%LINK-5-CHANGED: Interface FastEthernet0/18, changed state to
down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/18,
changed state to down
%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1,
changed state to up

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)#

Ctrl+F6 to exit CLI focus

Copy Paste
    
```

```

IOS Command Line Interface

S3(config-if)#ip add 192.168.99.3 255.255.255.0
S3(config-if)#no shut
S3(config-if)#exit
S3(config)#ip default-gateway 192.168.99.1
S3(config)#int f0/3
S3(config-if)#switch port mode trunk

% Invalid input detected at '^' marker.

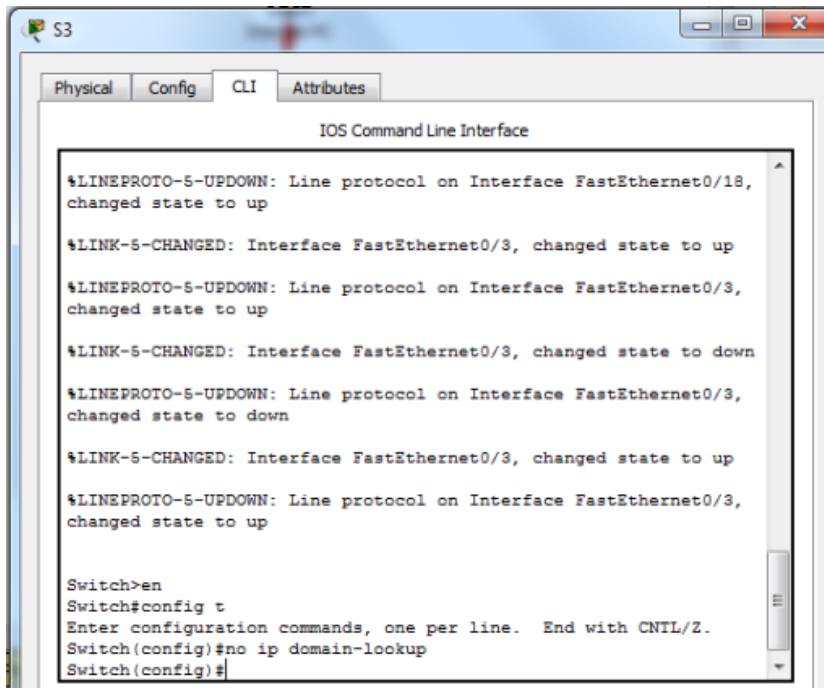
S3(config-if)#switchport mode trunk
S3(config-if)#switchport trunk native vlan 1
S3(config-if)#int range fa0/1-2, fa0/4-24
S3(config-if-range)#switchport mode access
S3(config-if-range)#int fa0/1
S3(config-if)#switchport mode access
S3(config-if)#switchport access vlan 40
S3(config-if)#int range fa0/2, 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
    
```

## 1.5 Deshabilitar DNS lookup

En el Switch 3 deshabilitar DNS lookup



```
S3
Physical Config CLI Attributes
IOS Command Line Interface

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/18,
changed state to up

%LINK-5-CHANGED: Interface FastEthernet0/3, changed state to up

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

%LINK-5-CHANGED: Interface FastEthernet0/3, changed state to down

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

%LINK-5-CHANGED: Interface FastEthernet0/3, changed state to up

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

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

## 1.6 Asignar Direcciones IP a los Switches

Asignar direcciones IP a los Switches acorde a los lineamientos.

```
S1(config-if)#ip address 192.168.99.2 255.255.255.0
S1(config-if)#no shut
S1(config-if)#default
```

```
S3(config-if)#ip add 192.168.99.3 255.255.255.0
S3(config-if)#no shut
S3(config-if)#exit
S3(config)#ip default-gateway 192.168.99.1
```

## 1.7 Desactivar Interfaces que no se utilizan

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

```
Enter configuration commands, one per line. End with CTRL/Z.  
S1(config)#int range fa0/2, fa0/4-23  
S1(config-if-range)#shutdown
```

```
S3(config-if)#switchport access vlan 40  
S3(config-if)#int range fa0/2, fa0/4-24  
S3(config-if-range)#shutdown
```

[Implement DHCP and NAT for IPv4](#)

## 1.8 Configurar R1 como servidor DHCP

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

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.

Packet tracer no admite comando DHCP server



```
R1>en
R1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#ip dhcp excluded-address 192.168.30.1 192.168.30.30
R1(config)#ip dhcp excluded-address 192.168.40.1 192.168.40.30
R1(config)#dhcp pool ADMINISTRACION
^
% Invalid input detected at '^' marker.

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)#ip dhcp pool MERCADERO
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)#
```

## 1.9 Reservar las 30 primeras IP de las VLAN 30 y 40

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

```
R1>en
R1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#ip dhcp excluded-address 192.168.30.1 192.168.30.30
R1(config)#ip dhcp excluded-address 192.168.40.1 192.168.40.30
R1(config)#
```

## 1.10 configuración de NAT en R2 g

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

```
R2>en
R2#config t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#ip nat inside source static 10.10.10.10
209.168.200.229
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)#
```

## 1.11 Configuración de listas estándar

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(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)#
```

```
BOGOTA
Physical Config CLI Attributes
IOS Command Line Interface

R2>en
R2#config t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#ip nat inside source static 10.10.10.10
209.168.200.229
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 209.165.200.225 209.165.200.228
netmask 255.255.255.248
R2(config)#ip nat inside source list 1 pool INTERNET
R2(config)#
```

## 1.12 configuración de listas extendidas

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.

```
BOGOTA
Physical Config CLI Attributes
IOS Command Line Interface

ms

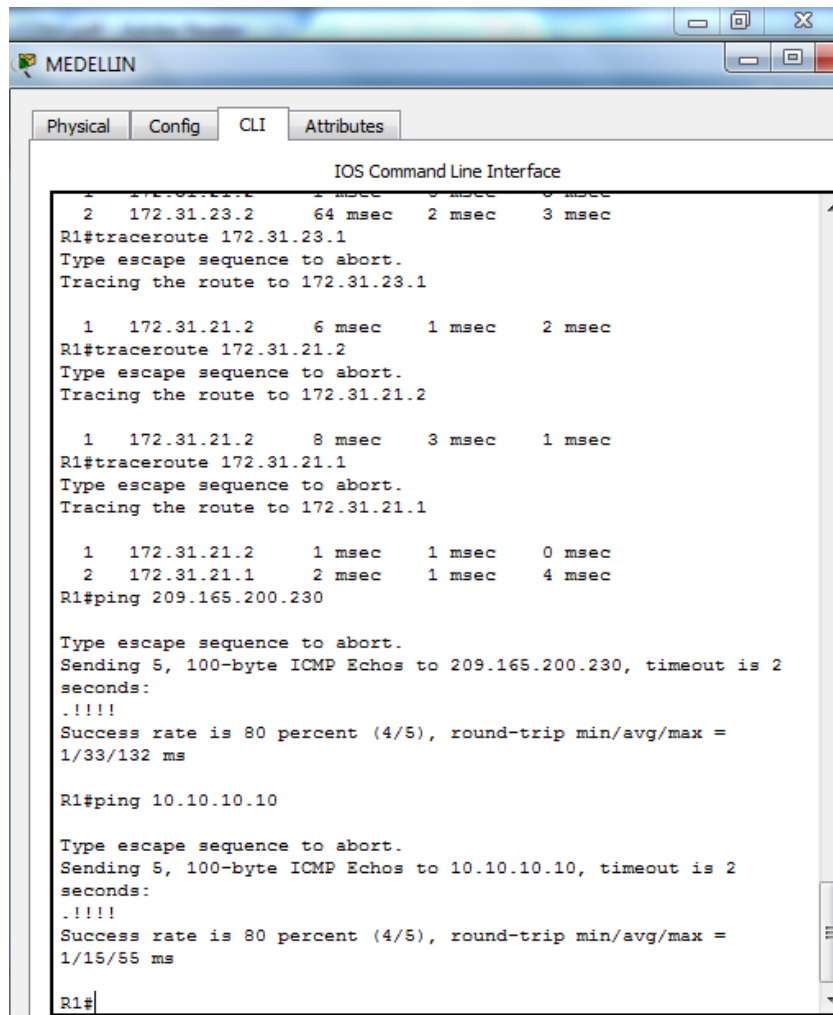
R2#
R2#copy running-config startup?
% Unrecognized command
R2#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
R2#config t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#ip access-list extended 101
R2(config-ext-nacl)#permit icmp any any echo-reply
R2(config-ext-nacl)#exit
R2(config)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface
GigabitEthernet0/1, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface
GigabitEthernet0/1, changed state to up

R2(config)#int g0/1
R2(config-if)#ip access-group 101 in
R2(config-if)#int g0/0
R2(config-if)#ip access-group 101 in
R2(config-if)#int s0/0/0
R2(config-if)#ip access-group 101 in
R2(config-if)#exit
R2(config)#exit
R2#
%SYS-5-CONFIG_I: Configured from console by console
```

## 1.13 Verificación de Trafico, ping y traceroute

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



The screenshot shows a Cisco IOS Command Line Interface (CLI) window titled "MEDELLIN". The window has tabs for "Physical", "Config", "CLI", and "Attributes", with "CLI" selected. The CLI output shows the following commands and results:

```
IOS Command Line Interface
  2 172.31.23.2 64 msec 2 msec 3 msec
R1#traceroute 172.31.23.1
Type escape sequence to abort.
Tracing the route to 172.31.23.1

 1 172.31.21.2 6 msec 1 msec 2 msec
R1#traceroute 172.31.21.2
Type escape sequence to abort.
Tracing the route to 172.31.21.2

 1 172.31.21.2 8 msec 3 msec 1 msec
R1#traceroute 172.31.21.1
Type escape sequence to abort.
Tracing the route to 172.31.21.1

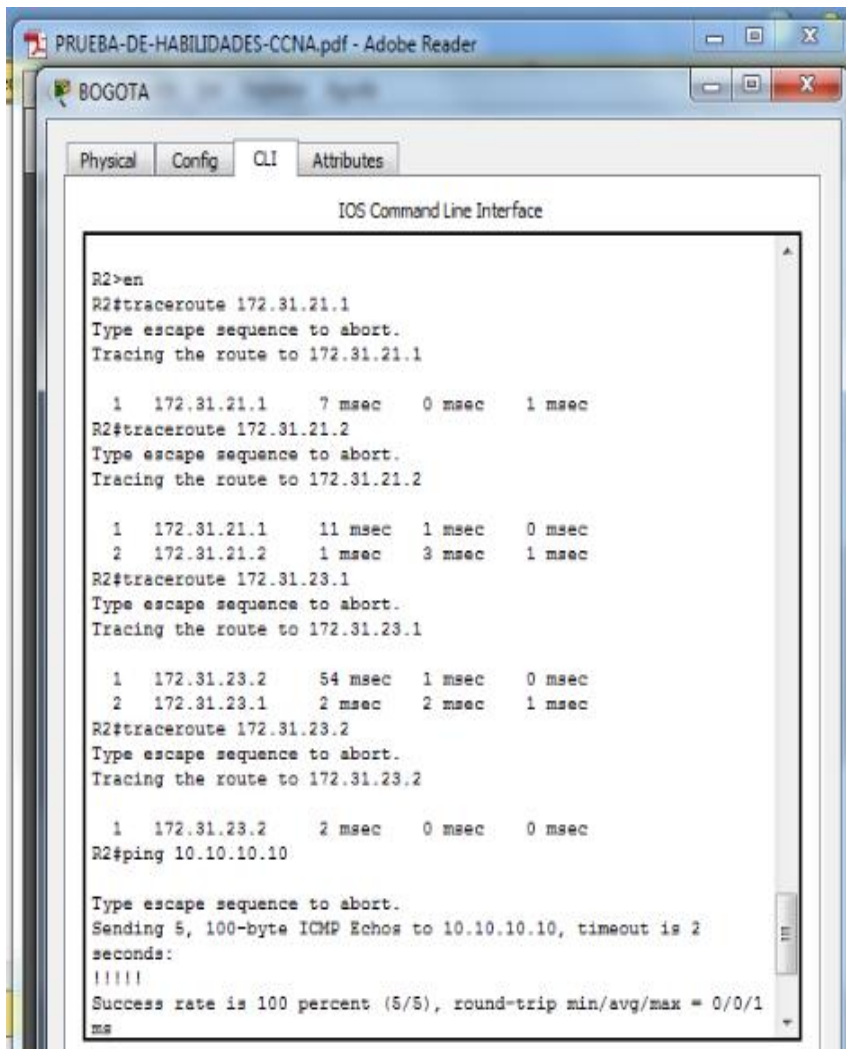
 1 172.31.21.2 1 msec 1 msec 0 msec
 2 172.31.21.1 2 msec 1 msec 4 msec
R1#ping 209.165.200.230

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 209.165.200.230, timeout is 2
seconds:
.!!!!
Success rate is 80 percent (4/5), round-trip min/avg/max =
1/33/132 ms

R1#ping 10.10.10.10

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.10.10.10, timeout is 2
seconds:
.!!!!
Success rate is 80 percent (4/5), round-trip min/avg/max =
1/15/55 ms

R1#
```



B/MANGA

Physical Config CLI Attributes

IOS Command Line Interface

```
Tracing the route to 172.31.23.1
  1  172.31.23.1    5 msec    1 msec    1 msec
R3#traceroute 172.31.23.2
Type escape sequence to abort.
Tracing the route to 172.31.23.2
  1  172.31.23.1    1 msec    0 msec    0 msec
  2  172.31.23.2    2 msec    3 msec    3 msec
R3#traceroute 10.10.10.10
Type escape sequence to abort.
Tracing the route to 10.10.10.10
  1  172.31.23.1    1 msec    2 msec    0 msec
  2  10.10.10.10   3 msec    1 msec    1 msec
R3#traceroute 192.168.99.3
Type escape sequence to abort.
Tracing the route to 192.168.99.3
  1  172.31.23.1    2 msec    1 msec    0 msec
  2  172.31.21.1    1 msec    0 msec    2 msec
  3  * *           2 msec
R3#ping 10.10.10.10

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.10.10.10, timeout is 2
seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max =
1/6/22 ms
R3#
```

Herramientas Rellenar y firmar Comentario

PC-A

Physical Config Desktop Programming Attributes

Command Prompt

```
C:\>
C:\>tracert 192.168.40.31

Tracing route to 192.168.40.31 over a maximum of 30 hops:

  1  1 ms    0 ms    1 ms    192.168.30.1
  2  0 ms    0 ms    0 ms    192.168.40.31

Trace complete.

C:\>tracert 172.31.23.2

Tracing route to 172.31.23.2 over a maximum of 30 hops:

  1  0 ms    0 ms    0 ms    192.168.30.1
  2  17 ms   1 ms    1 ms    172.31.21.2
  3  1 ms    2 ms    0 ms    172.31.23.2

Trace complete.

C:\>tracert 10.10.10.10

Tracing route to 10.10.10.10 over a maximum of 30 hops:

  1  1 ms    0 ms    1 ms    192.168.30.1
  2  9 ms    0 ms    0 ms    172.31.21.2
```

## 2. CONCLUSIONES

En esta prueba de habilidades practicas se busca profundizar la capacidad de configurar y administrar dispositivos de Networking utilizando comandos de configuración avanzada en routers, implementando, OSPF y enrutamiento estático; bajo un esquema de direccionamiento IP sin clase, con el fin de diseñar e implementar soluciones de red y conectividad escalables, mediante el uso de herramientas de simulación como lo es Packet Tracer configurando esquemas de conmutación soportadas en Switches, mediante el uso de protocolos basados en VLANs y encapsulamiento por 802.1q en escenarios corporativos



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