

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

Paso 11

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Grupo 6

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Introducción

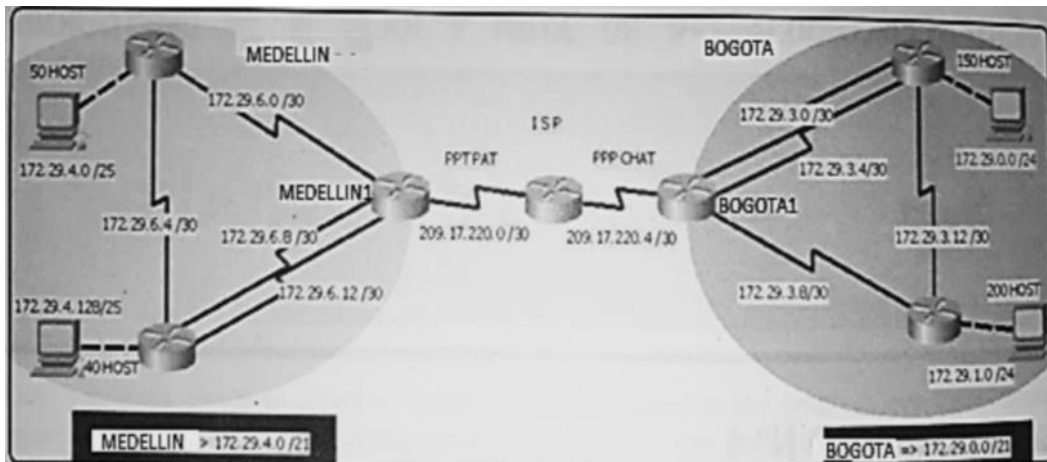
Las redes hacen parte de la cotidianidad actual, aunque no se tenga un conocimiento amplio acerca de estas, si se tiene la certeza de que las encontramos en muchas de las actividades que desarrollamos, a nivel académico, laboral, profesional o cualquier ámbito que requiera del uso de la comunicación y transmisión de datos a través de ordenadores; este diplomado permite conocer más a fondo como las redes funcionan y cómo podemos usarlas para nuestro beneficio y que dispositivos forman parte de esto. En esta actividad final se pondrán a prueba los conocimientos adquiridos por parte del estudiante en este periodo académico, siendo esto plasmado en el desarrollo de 2 escenarios que requieren de lo aprendido en cada actividad desarrollada previamente.

Contenido

Introducción	2
Escenario 1.....	4
<i>Parte 1: Configuración del enrutamiento</i>	14
<i>Parte 2: Tabla de Enrutamiento</i>	21
<i>Parte 3: Deshabilitar la propagación del protocolo RIP</i>	25
<i>Parte 4: Verificación del protocolo RIP</i>	28
<i>Parte 5: Configurar encapsulamiento y autenticación PPP</i>	34
<i>Parte 6: Configuración de PAT.</i>	36
<i>Parte 7: Configuración del servicio DHCP</i>	39
Escenario 2.....	40
1. <i>Configurar el direccionamiento IP acorde con la topología de red para cada uno de los dispositivos que forman parte del escenario</i>	41
2. <i>Configurar el protocolo de enrutamiento OSPFv2 bajo los siguientes criterios.....</i>	45
3. <i>Configurar VLANs, Puertos troncales, puertos de acceso, encapsulamiento, Inter-VLAN Routing y Seguridad en los Switches acorde a la topología de red establecida</i>	50
9. <i>Reservar las primeras 30 direcciones IP de las VLAN 30 y 40 para configuraciones estáticas ..</i>	51
Conclusiones	53
Referencias	54

Escenario 1

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



Este escenario plantea el uso de RIP como protocolo de enrutamiento, considerando que se tendrán rutas por defecto redistribuidas; asimismo, habilitar el encapsulamiento PPP y su autenticación.

Los routers Bogota2 y medellin2 proporcionan el servicio DHCP a su propia red LAN y a los routers 3 de cada ciudad.

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

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

Desarrollo

Como trabajo inicial se debe realizar lo siguiente.

- Realizar las rutinas de diagnóstico y dejar los equipos listos para su configuración (asignar nombres de equipos, asignar claves de seguridad, etc).
- Realizar la conexión física de los equipos con base en la topología de red

Para la conexión física definimos la tabla de direccionamiento así:

Dispositivo	Interfaz	Dirección IP	Máscara de subred
Medellin1	S0/0/0	209.17.220.1	255.255.255.252
	S0/0/1	172.29.6.9	255.255.255.252
	S0/1/0	172.29.6.1	255.255.255.252
	S0/1/1	172.29.6.13	255.255.255.252
Medellin2	G0/0	172.29.4.126	255.255.255.128
	S0/0/0	172.29.6.5	255.255.255.252
	S0/0/1	172.29.6.1	255.255.255.252
Medellin3	G0/0	172.29.4.129	255.255.255.128
	S0/0/0	172.29.6.6	255.255.255.252
	S0/0/1	172.29.6.10	255.255.255.252
	S0/1/0	172.29.6.14	255.255.255.252
Bogota1	S0/0/0	172.29.3.5	255.255.255.252
	S0/0/1	172.29.3.9	255.255.255.252
	S0/1/0	209.17.220.5	255.255.255.252
	S0/1/1	172.29.3.1	255.255.255.252
Bogota2	G0/0	172.29.1.2	255.255.255.0
	S0/0/0	172.29.3.13	255.255.255.252
	S0/0/1	172.29.3.9	255.255.255.252
Bogota3	G0/0	172.29.0.2	255.255.255.0
	S0/0/0	172.29.3.6	255.255.255.252
	S0/0/1	172.29.3.14	255.255.255.252
	S0/1/0	172.29.3.2	255.255.255.252
ISP	S0/0/0	209.17.220.2	255.255.255.252
	S0/0/1	209.17.220.6	255.255.255.252
PC 0	NIC	172.29.4.1	255.255.255.252
PC 1	NIC	172.29.4.130	255.255.255.128
PC 2	NIC	172.29.0.1	255.255.255.0

PC 3	NIC	172.29.1.1	255.255.255.0
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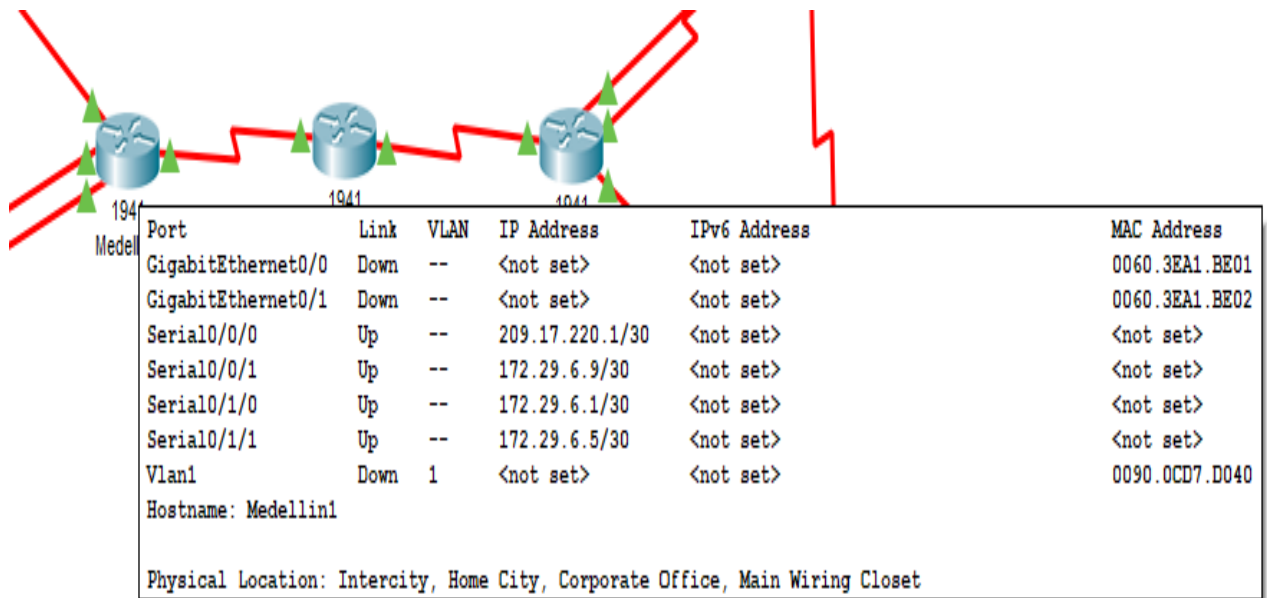
Para asignar claves y nombres de equipo usamos el siguiente código aplicado al Router Medellín 1. Lo cual será aplicado al resto de Routers de acuerdo a sus conexiones y nombres.

```
Router>enable
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#no ip domain-lookup
Router(config)#hostname Medellín1
Medellin1(config)#enable secret class
Medellin1(config)#line console 0
Medellin1(config-line)#password cisco
Medellin1(config-line)#login
Medellin1(config-line)#exit
Medellin1(config)#
```

Press RETURN to get started!

```
Medellin1>enable
Password:
Password:
Medellin1#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Medellin1(config)#interface Serial0/0/0
Medellin1(config-if)#ip address 209.17.220.1 255.255.255.252
Medellin1(config-if)#exit
```

```
Medellin1(config)#interface Serial0/0/1
Medellin1(config-if)#ip address 172.29.6.9 255.255.255.252
Medellin1(config-if)#
Medellin1(config-if)#exit
Medellin1(config)#interface Serial0/1/0
Medellin1(config-if)#ip address 172.29.6.1 255.255.255.252
Medellin1(config-if)#
Medellin1(config-if)#exit
Medellin1(config)#interface Serial0/1/1
Medellin1(config-if)#ip address 172.29.6.5 255.255.255.252
Medellin1(config-if)#
Medellin1(config-if)#exit
```



Medellin2

```

Router>enable
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#no ip domain-lookup
Router(config)#hostname Medellin2
Medellin2(config)#enable secret class
Medellin2(config)#line console 0
Medellin2(config-line)#password cisco
Medellin2(config-line)#login
Medellin2(config-line)#exit
Medellin2(config)#

```

Press RETURN to get started!

```

Password:
Medellin2>enable
Password:
Password:
Medellin2#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Medellin2(config)#interface GigabitEthernet0/0
Medellin2(config-if)#ip address 172.29.4.126 255.255.255.128
Medellin2(config-if)#

```

Medellin1(config-if)#exit

Password:
Medellin2>enable

Password:
Password:

Medellin2#configure terminal

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

Medellin2(config)#interface Serial0/0/0

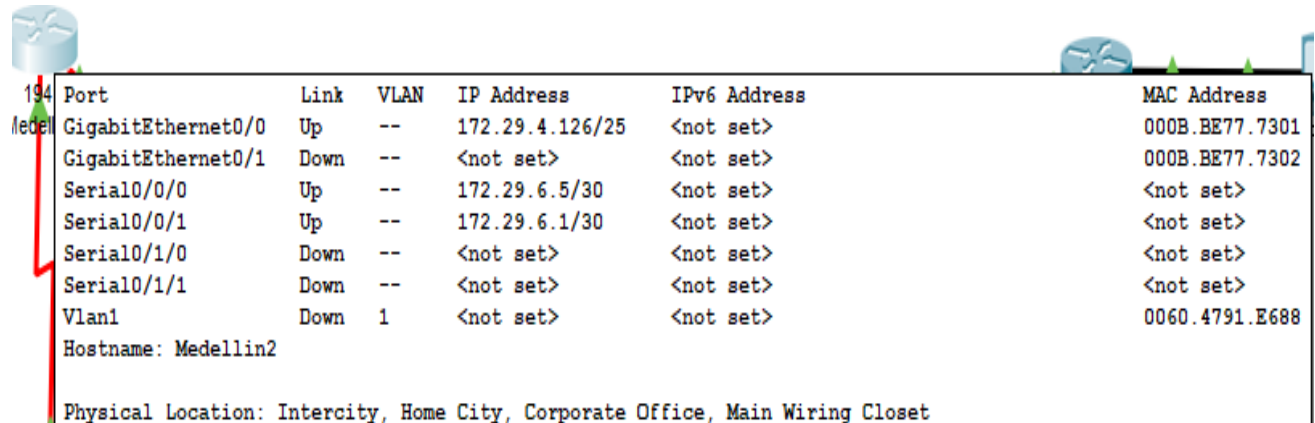
Medellin2(config-if)#ip address 172.29.6.5 255.255.255.252

Medellin2(config-if)#exit

Medellin2(config)#interface Serial0/0/1

Medellin2(config-if)#ip address 172.29.6.1 255.255.255.252

Medellin2(config-if)#exit



The screenshot shows a network device configuration page. At the top left, there is a router icon with the number '194' next to it. The main content is a table with the following columns: Port, Link, VLAN, IP Address, IPv6 Address, and MAC Address. Below the table, there is a 'Hostname' field and a 'Physical Location' field. The table contains the following data:

Port	Link	VLAN	IP Address	IPv6 Address	MAC Address
GigabitEthernet0/0	Up	--	172.29.4.126/25	<not set>	000B.BE77.7301
GigabitEthernet0/1	Down	--	<not set>	<not set>	000B.BE77.7302
Serial0/0/0	Up	--	172.29.6.5/30	<not set>	<not set>
Serial0/0/1	Up	--	172.29.6.1/30	<not set>	<not set>
Serial0/1/0	Down	--	<not set>	<not set>	<not set>
Serial0/1/1	Down	--	<not set>	<not set>	<not set>
Vlan1	Down	1	<not set>	<not set>	0060.4791.E688

Below the table, the 'Hostname' is set to 'Medellin2'. The 'Physical Location' is 'Intercity, Home City, Corporate Office, Main Wiring Closet'.

Medellin3

Router>enable

Router#config t

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

Router(config)#no ip domain-lookup

Router(config)#hostname Medellin3

Medellin3(config)#enable secret class

Medellin3(config)#line console 0

Medellin3(config-line)#password cisco

Medellin3(config-line)#login

Medellin3(config-line)#exit

Medellin3(config)#

Press RETURN to get started!

```
Medellin3>enable
```

```
Password:
```

```
Medellin3#configure terminal
```

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

```
Medellin3(config)#interface GigabitEthernet0/0
```

```
Medellin3(config-if)#ip address 172.29.4.129 255.255.255.128
```

```
Medellin3(config-if)#exit
```

```
Medellin3(config)#interface Serial0/0/0
```

```
Medellin3(config-if)#ip address 172.29.6.6 255.255.255.252
```

```
Medellin3(config-if)# exit
```

```
Medellin3(config)#interface Serial0/0/1
```

```
Medellin3(config-if)#ip address 172.29.6.10 255.255.255.252
```

```
Medellin3(config-if)#exit
```

```
Medellin3(config)#interface Serial0/1/0
```

```
Medellin3(config-if)#ip address 172.29.6.14 255.255.255.252
```

```
Medellin3(config-if)#exit
```



Port	Link	VLAN	IP Address	IPv6 Address	MAC Address
GigabitEthernet0/0	Up	--	172.29.4.129/25	<not set>	00E0.8F88.2001
GigabitEthernet0/1	Down	--	<not set>	<not set>	00E0.8F88.2002
Serial0/0/0	Up	--	172.29.6.6/30	<not set>	<not set>
Serial0/0/1	Up	--	172.29.6.10/30	<not set>	<not set>
Serial0/1/0	Up	--	172.29.6.14/30	<not set>	<not set>
Serial0/1/1	Down	--	<not set>	<not set>	<not set>
Vlan1	Down	1	<not set>	<not set>	0090.0C95.ECBA

Hostname: Medellin3

Physical Location: Intercity, Home City, Corporate Office, Main Wiring Closet

Bogota1

```
Router>enable
```

```
Router#config t
```

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

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

```
Router(config)#hostname Bogota1
```

```
Bogota1 (config)#enable secret class
```

```
Bogota1 (config)#line console 0
```

```
Bogota1 (config-line)#password cisco
```

```
Bogota1 (config-line)#login
```

```
Bogota1 (config-line)#exit
```

```
Bogota1 (config)#
```

Press RETURN to get started!

```

Bogota1>enable
Password:
Bogota1#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Bogota1(config)#interface Serial0/0/0
Bogota1(config-if)#ip address 172.29.3.5 255.255.255.252
Bogota1(config-if)#exit
Bogota1(config)#interface Serial0/0/1
Bogota1(config-if)#ip address 172.29.3.9 255.255.255.252
Bogota1(config-if)#exit
Bogota1(config)#interface Serial0/1/0
Bogota1(config-if)#ip address 209.17.220.5 255.255.255.252
Bogota1(config-if)#exit
Bogota1(config)#interface Serial0/1/1
Bogota1(config-if)#ip address 172.29.3.1 255.255.255.252
Bogota1(config-if)#

```

Port	Link	VLAN	IP Address	IPv6 Address	MAC Address
GigabitEthernet0/0	Down	--	<not set>	<not set>	0010.11D7.E701
GigabitEthernet0/1	Down	--	<not set>	<not set>	0010.11D7.E702
Serial0/0/0	Up	--	172.29.3.5/30	<not set>	<not set>
Serial0/0/1	Up	--	172.29.3.9/30	<not set>	<not set>
Serial0/1/0	Up	--	209.17.220.5/30	<not set>	<not set>
Serial0/1/1	Up	--	172.29.3.1/30	<not set>	<not set>
Vlan1	Down	1	<not set>	<not set>	00D0.BC4D.2CB9

Hostname: Bogota1

Physical Location: Intercity, Home City, Corporate Office, Main Wiring Closet

Bogota2

```

Router>enable
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#no ip domain-lookup
Router(config)#hostname Bogota2
Bogota2 (config)#enable secret class
Bogota2 (config)#line console 0
Bogota2 (config-line)#password cisco
Bogota2 (config-line)#login
Bogota2 (config-line)#exit
Bogota2 (config)#

```

```

Bogota2>enable
Password:
Bogota2#configure terminal

```

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

```
Bogota2(config)#interface GigabitEthernet0/0
Bogota2(config-if)#ip address 172.29.1.2 255.255.255.0
Bogota2(config-if)#exit
```

```
Bogota2(config)#interface Serial0/0/0
Bogota2(config-if)#ip address 172.29.3.13 255.255.255.252
Bogota2(config-if)#exit
```

```
Bogota2(config)#interface Serial0/0/1
Bogota2(config-if)#ip address 172.29.3.9 255.255.255.252
Bogota2(config-if)#exit
```

Port	Link	VLAN	IP Address	IPv6 Address	MAC Address
GigabitEthernet0/0	Up	--	172.29.1.2/24	<not set>	0001.63C8.7001
GigabitEthernet0/1	Down	--	<not set>	<not set>	0001.63C8.7002
Serial0/0/0	Up	--	172.29.3.13/30	<not set>	<not set>
Serial0/0/1	Up	--	172.29.3.9/30	<not set>	<not set>
Serial0/1/0	Down	--	<not set>	<not set>	<not set>
Serial0/1/1	Down	--	<not set>	<not set>	<not set>
Vlan1	Down	1	<not set>	<not set>	0090.2BB4.24EE

Hostname: Bogota2

Physical Location: Intercity, Home City, Corporate Office, Main Wiring Closet

Bogota3

```
Router>enable
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#no ip domain-lookup
Router(config)#hostname Bogota3
Bogota3 (config)#enable secret class
Bogota3 (config)#line console 0
Bogota3 (config-line)#password cisco
Bogota3 (config-line)#login
Bogota3 (config-line)#exit
Bogota3 (config)#
```

```
Bogota3(config)#interface GigabitEthernet0/0
Bogota3(config-if)#ip address 172.29.0.2 255.255.255.0
Bogota3(config-if)#exit
Bogota3(config)#interface Serial0/0/0
Bogota3(config-if)#ip address 172.29.3.6 255.255.255.252
Bogota3(config-if)#exit
Bogota3(config)#interface Serial0/0/1
Bogota3(config-if)#ip address 172.29.3.14 255.255.255.252
Bogota3(config-if)#exit
Bogota3(config)#interface Serial0/1/0
Bogota3(config-if)#ip address 172.29.3.2 255.255.255.252
Bogota3(config-if)#exit
```

Port	Link	VLAN	IP Address	IPv6 Address	MAC Address
GigabitEthernet0/0	Up	--	172.29.0.2/24	<not set>	0000.0CB4.E901
GigabitEthernet0/1	Down	--	<not set>	<not set>	0000.0CB4.E902
Serial0/0/0	Up	--	172.29.3.6/30	<not set>	<not set>
Serial0/0/1	Up	--	172.29.3.14/30	<not set>	<not set>
Serial0/1/0	Up	--	172.29.3.2/30	<not set>	<not set>
Serial0/1/1	Down	--	<not set>	<not set>	<not set>
Vlan1	Down	1	<not set>	<not set>	000A.41AE.0AC0

Hostname: Bogota3

Physical Location: Intercity, Home City, Corporate Office, Main Wiring Closet

ISP

```

Router>enable
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#no ip domain-lookup
Router(config)#hostname ISP
ISP (config)#enable secret class
ISP (config)#line console 0
ISP (config-line)#password cisco
ISP (config-line)#login
ISP 3 (config-line)#exit
ISP (config)#

ISP(config)#interface Serial0/0/0
ISP(config-if)#ip address 209.17.220.2 255.255.255.252
ISP(config-if)#exit
ISP(config)#interface Serial0/0/1
ISP(config-if)#ip address 209.17.220.6 255.255.255.252
ISP(config-if)#

```

Port	Link	VLAN	IP Address	IPv6 Address	MAC Address
GigabitEthernet0/0	Down	--	<not set>	<not set>	0050.0F7B.1501
GigabitEthernet0/1	Down	--	<not set>	<not set>	0050.0F7B.1502
Serial0/0/0	Up	--	209.17.220.2/30	<not set>	<not set>
Serial0/0/1	Up	--	209.17.220.6/30	<not set>	<not set>
Serial0/1/0	Down	--	<not set>	<not set>	<not set>
Serial0/1/1	Down	--	<not set>	<not set>	<not set>
Vlan1	Down	1	<not set>	<not set>	000B.BEB4.76A9

Hostname: ISP

Physical Location: Intercity, Home City, Corporate Office, Main Wiring Closet

PC 0

PC0 configuration window showing the Desktop tab. The configuration is set to Static IP. The fields are: IP Address: 172.29.4.1, Subnet Mask: 255.255.255.128, Default Gateway: 172.29.4.2, and DNS Server: 0.0.0.0.

Field	Value
IP Address	172.29.4.1
Subnet Mask	255.255.255.128
Default Gateway	172.29.4.2
DNS Server	0.0.0.0

PC 1

PC1 configuration window showing the Desktop tab. The configuration is set to Static IP. The fields are: IP Address: 172.29.4.130, Subnet Mask: 255.255.255.128, Default Gateway: 172.29.4.254, and DNS Server: 0.0.0.0. A message states: "This address is already used in the network."

Field	Value
IP Address	172.29.4.130
Subnet Mask	255.255.255.128
Default Gateway	172.29.4.254
DNS Server	0.0.0.0

PC 2

PC2 configuration window showing the Desktop tab. The configuration is set to Static IP. The fields are: IP Address: 172.29.0.1, Subnet Mask: 255.255.255.0, Default Gateway: 172.29.0.254, and DNS Server: 0.0.0.0.

Field	Value
IP Address	172.29.0.1
Subnet Mask	255.255.255.0
Default Gateway	172.29.0.254
DNS Server	0.0.0.0

PC 3

PC3 configuration window showing the Desktop tab. The configuration is set to Static IP. The fields are: IP Address: 172.29.1.1, Subnet Mask: 255.255.255.0, Default Gateway: 172.29.1.254, and DNS Server: 0.0.0.0.

Field	Value
IP Address	172.29.1.1
Subnet Mask	255.255.255.0
Default Gateway	172.29.1.254
DNS Server	0.0.0.0

Parte 1: Configuración del enrutamiento

a. Configurar el enrutamiento en la red usando el protocolo RIP versión 2, declare la red principal, desactive la sumarización automática.

Medellin1

User Access Verification

Password:

Medellin1>enable

Password:

Medellin1#config t

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

Medellin1(config)#router rip

Medellin1(config-router)#version 2

Medellin1(config-router)#no auto-summary

Medellin1(config-router)#network 209.17.220.0

Medellin1(config-router)#network 172.29.6.12

Medellin1(config-router)#network 172.29.6.8

Medellin1(config-router)#network 172.29.6.0

Medellin1(config-router)#exit

Medellin1(config)#exit

Medellin1#

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

Medellin1#copy run start

Destination filename [startup-config]?

Building configuration...

[OK]

Medellin1#

Medellin2

User Access Verification

Password:

Medellin2>enable

Password:

Medellin2#config t

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

Medellin2(config)#router rip

Medellin2(config-router)#version 2

Medellin2(config-router)#no auto-summary

Medellin2(config-router)#network 172.29.4.0

Medellin2(config-router)#network 172.29.6.0

Medellin2(config-router)#network 172.26.6.4

```
Medellin2(config-router)#exit
Medellin2(config)#exit
Medellin2#
%SYS-5-CONFIG_I: Configured from console by console
```

```
Medellin2#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
Medellin2#
```

Medellin3

User Access Verification

Password:

```
Medellin3>enable
Password:
Medellin3#config t
Enter configuration commands, one per line. End with CNTL/Z.
Medellin3(config)#router rip
Medellin3(config-router)#version 2
Medellin3(config-router)#no auto-summary
Medellin3(config-router)#172.29.6.12
^
% Invalid input detected at '^' marker.
Medellin3(config-router)#network 172.29.6.12
Medellin3(config-router)#network 172.29.6.8
Medellin3(config-router)#network 172.29.6.4
Medellin3(config-router)#exit
Medellin3(config)#exit
Medellin3#
%SYS-5-CONFIG_I: Configured from console by console
```

```
Medellin3#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
Medellin3#
```

Bogota1

User Access Verification

Password:

Bogota1>enable

Password:

Bogota1#config t

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

Bogota1(config)#router rip

Bogota1(config-router)#version 2

Bogota1(config-router)#no auto-summary

Bogota1(config-router)#network 209.17.220.4

Bogota1(config-router)#network 172.29.3.8

Bogota1(config-router)#network 172.29.3.4

Bogota1(config-router)#network 172.29.3.0

Bogota1(config-router)#exit

Bogota1(config)#exit

Bogota1#

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

Bogota1#copy run start

Destination filename [startup-config]?

Building configuration...

[OK]

Bogota1#

Bogota2

User Access Verification

Password:

Password:

Bogota2>enable

Password:

Bogota2#config t

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

Bogota2(config)#router rip

Bogota2(config-router)#version 2

Bogota2(config-router)#no auto-summary

Bogota2(config-router)#network 172.29.1.0

Bogota2(config-router)#network 172.29.3.8

Bogota2(config-router)#network 172.29.3.12

Bogota2(config-router)#exit

Bogota2(config)#exit

```
Bogota2#
%SYS-5-CONFIG_I: Configured from console by console
```

```
Bogota2#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
Bogota2#
```

Bogota3

User Access Verification

Password:

```
Bogota3>enable
Password:
Bogota3#config t
Enter configuration commands, one per line. End with CNTL/Z.
Bogota3(config)#router rip
Bogota3(config-router)#version 2
Bogota3(config-router)#no auto-summary
Bogota3(config-router)#network 172.29.0.0
Bogota3(config-router)#network 172.29.3.12
Bogota3(config-router)#network 172.29.3.4
Bogota3(config-router)#network 172.29.3.0
Bogota3(config-router)#exit
Bogota3(config)#exit
Bogota3#
%SYS-5-CONFIG_I: Configured from console by console
```

```
Bogota3#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
Bogota3#
```

b. Los routers Bogota1 y Medellín deberán añadir a su configuración de enrutamiento una ruta por defecto hacia el ISP y, a su vez, redistribuirla dentro de las publicaciones de RIP.

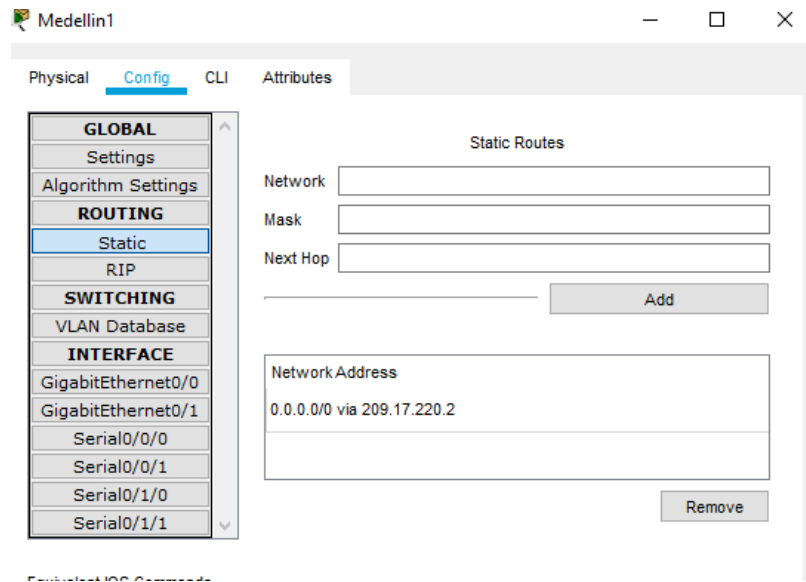
Medellin1

User Access Verification

Password:

```
Medellin1>en
```

Password:
Medellin1#config t
Enter configuration commands, one per line. End with CNTL/Z.
Medellin1(config)#ip route
% Incomplete command.
Medellin1(config)#ip route ?
A.B.C.D Destination prefix
Medellin1(config)#ip route 0.0.0.0 0.0.0.0 209.17.220.2
Medellin1(config)#exit
Medellin1#
%SYS-5-CONFIG_I: Configured from console by console



Bogota1

User Access Verification

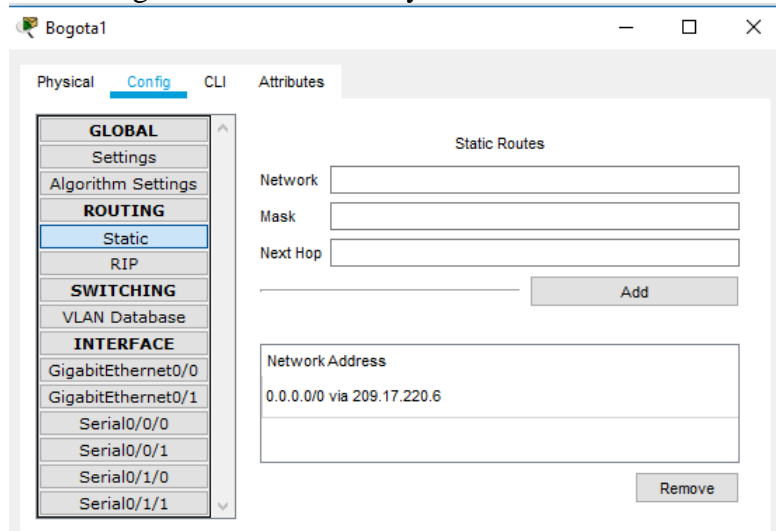
Password:

Bogota1>en
Password:
Bogota1#config t
Enter configuration commands, one per line. End with CNTL/Z.

```

Bogota1(config)#ip route ?
A.B.C.D Destination prefix
Bogota1(config)#ip route 0.0.0.0 0.0.0.0 209.17.220.6
Bogota1(config)#exit
Bogota1#
%SYS-5-CONFIG_I: Configured from console by console

```



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

User Access Verification

Password:

ISP>en

Password:

ISP#config t

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

ISP(config)#ip route ?

A.B.C.D Destination prefix

ISP(config)#ip route 192.29.6.0 255.255.255.252 209.17.220.1

ISP(config)#ip route 172.29.6.8 255.255.255.252 209.17.220.1

ISP(config)#ip route 172.29.6.12 255.255.255.252 209.17.220.1

ISP(config)#ip route 172.29.6.4 255.255.255.252 209.17.220.1

ISP(config)#

ISP(config)#ip route 172.29.3.0 255.255.255.252 209.17.220.5

ISP(config)#ip route 172.29.3.4 255.255.255.252 209.17.220.5

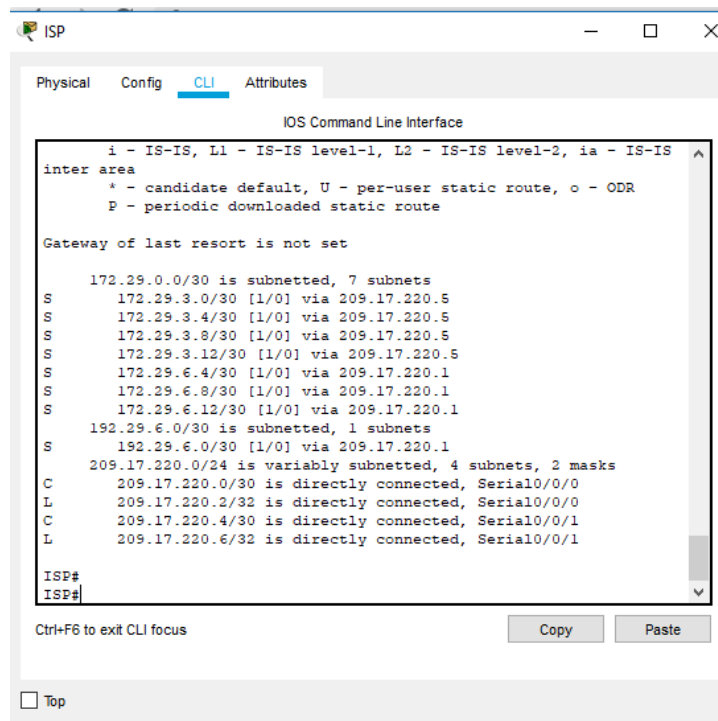
ISP(config)#ip route 172.29.3.8 255.255.255.252 209.17.220.5

ISP(config)#ip route 172.29.3.12 255.255.255.252 209.17.220.5

ISP(config)#exit

ISP#

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



The screenshot shows a Cisco IOS Command Line Interface window titled "ISP". The window has tabs for "Physical", "Config", "CLI", and "Attributes", with "CLI" selected. The main content area displays the output of a routing table command. The output includes a legend for IS-IS levels, a note about the gateway of last resort, and a list of routes with their metrics and next hops. The routes are categorized by type: S (Static), C (Connected), and L (Local). The window also features a "Ctrl+F6 to exit CLI focus" prompt, "Copy" and "Paste" buttons, and a "Top" button at the bottom left.

```
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS
inter area
* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route

Gateway of last resort is not set

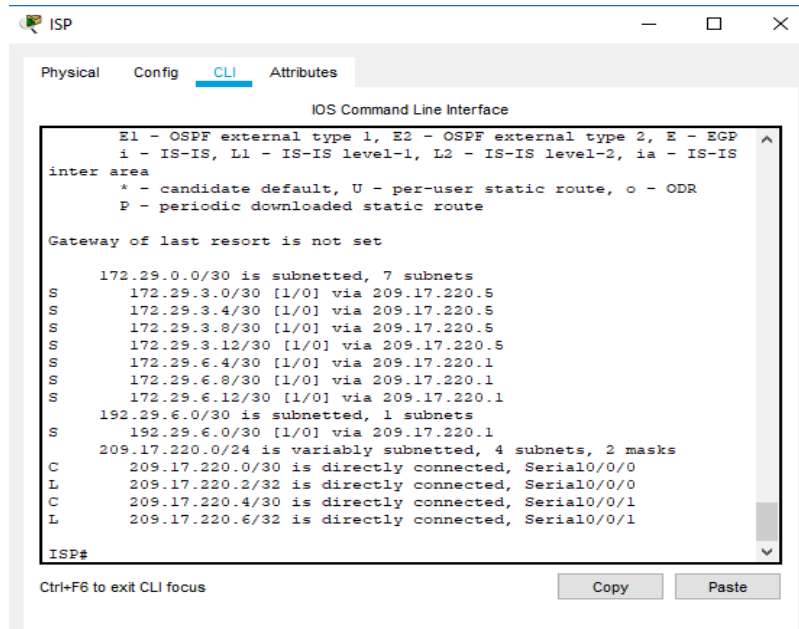
172.29.0.0/30 is subnetted, 7 subnets
S    172.29.3.0/30 [1/0] via 209.17.220.5
S    172.29.3.4/30 [1/0] via 209.17.220.5
S    172.29.3.8/30 [1/0] via 209.17.220.5
S    172.29.3.12/30 [1/0] via 209.17.220.5
S    172.29.6.4/30 [1/0] via 209.17.220.1
S    172.29.6.8/30 [1/0] via 209.17.220.1
S    172.29.6.12/30 [1/0] via 209.17.220.1
192.29.6.0/30 is subnetted, 1 subnets
S    192.29.6.0/30 [1/0] via 209.17.220.1
209.17.220.0/24 is variably subnetted, 4 subnets, 2 masks
C    209.17.220.0/30 is directly connected, Serial0/0/0
L    209.17.220.2/32 is directly connected, Serial0/0/0
C    209.17.220.4/30 is directly connected, Serial0/0/1
L    209.17.220.6/32 is directly connected, Serial0/0/1

ISP#
ISP#
```

Parte 2: Tabla de Enrutamiento.

a. Verificar la tabla de enrutamiento en cada uno de los routers para comprobar las redes y sus rutas.

ISP



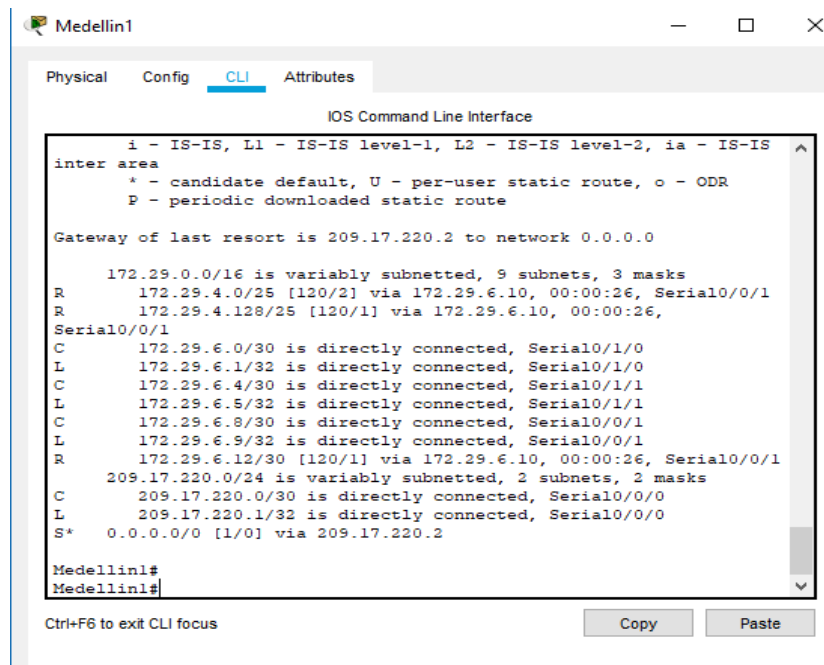
```
ISP
Physical Config CLI Attributes
IOS Command Line Interface
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS
inter area
* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route

Gateway of last resort is not set

  172.29.0.0/30 is subnetted, 7 subnets
S   172.29.3.0/30 [1/0] via 209.17.220.5
S   172.29.3.4/30 [1/0] via 209.17.220.5
S   172.29.3.8/30 [1/0] via 209.17.220.5
S   172.29.3.12/30 [1/0] via 209.17.220.5
S   172.29.6.4/30 [1/0] via 209.17.220.1
S   172.29.6.8/30 [1/0] via 209.17.220.1
S   172.29.6.12/30 [1/0] via 209.17.220.1
  192.29.6.0/30 is subnetted, 1 subnets
S   192.29.6.0/30 [1/0] via 209.17.220.1
  209.17.220.0/24 is variably subnetted, 4 subnets, 2 masks
C   209.17.220.0/30 is directly connected, Serial0/0/0
L   209.17.220.2/32 is directly connected, Serial0/0/0
C   209.17.220.4/30 is directly connected, Serial0/0/1
L   209.17.220.6/32 is directly connected, Serial0/0/1

ISP#
```

Medellin1



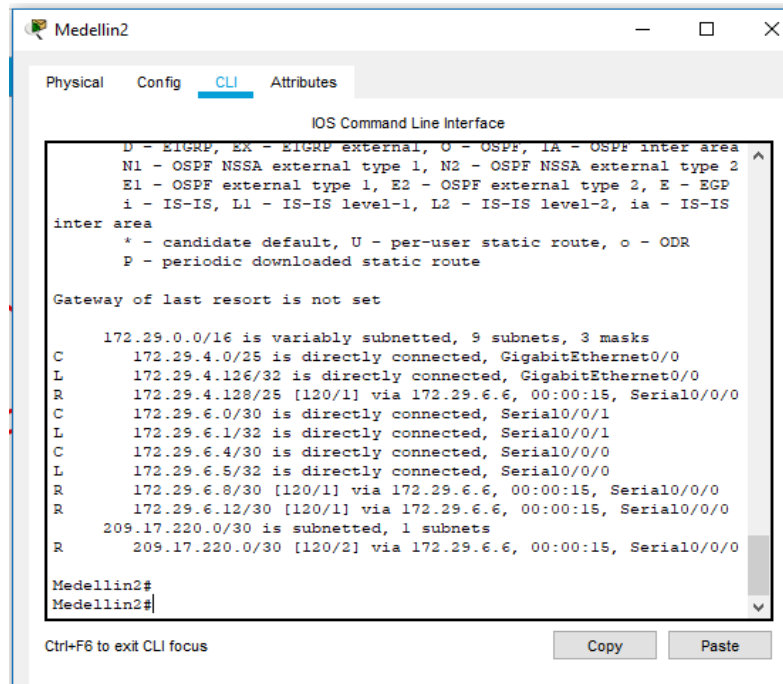
```
Medellin1
Physical Config CLI Attributes
IOS Command Line Interface
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS
inter area
* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route

Gateway of last resort is 209.17.220.2 to network 0.0.0.0

  172.29.0.0/16 is variably subnetted, 9 subnets, 3 masks
R   172.29.4.0/25 [120/2] via 172.29.6.10, 00:00:26, Serial0/0/1
R   172.29.4.128/25 [120/1] via 172.29.6.10, 00:00:26,
Serial0/0/1
C   172.29.6.0/30 is directly connected, Serial0/1/0
L   172.29.6.1/32 is directly connected, Serial0/1/0
C   172.29.6.4/30 is directly connected, Serial0/1/1
L   172.29.6.5/32 is directly connected, Serial0/1/1
C   172.29.6.8/30 is directly connected, Serial0/0/1
L   172.29.6.9/32 is directly connected, Serial0/0/1
R   172.29.6.12/30 [120/1] via 172.29.6.10, 00:00:26, Serial0/0/1
  209.17.220.0/24 is variably subnetted, 2 subnets, 2 masks
C   209.17.220.0/30 is directly connected, Serial0/0/0
L   209.17.220.1/32 is directly connected, Serial0/0/0
S*  0.0.0.0/0 [1/0] via 209.17.220.2

Medellin1#
Medellin1#
```

Medellin2



The screenshot shows the Medellin2 CLI interface with the following content:

```
IOS Command Line Interface
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS
inter area
* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route

Gateway of last resort is not set

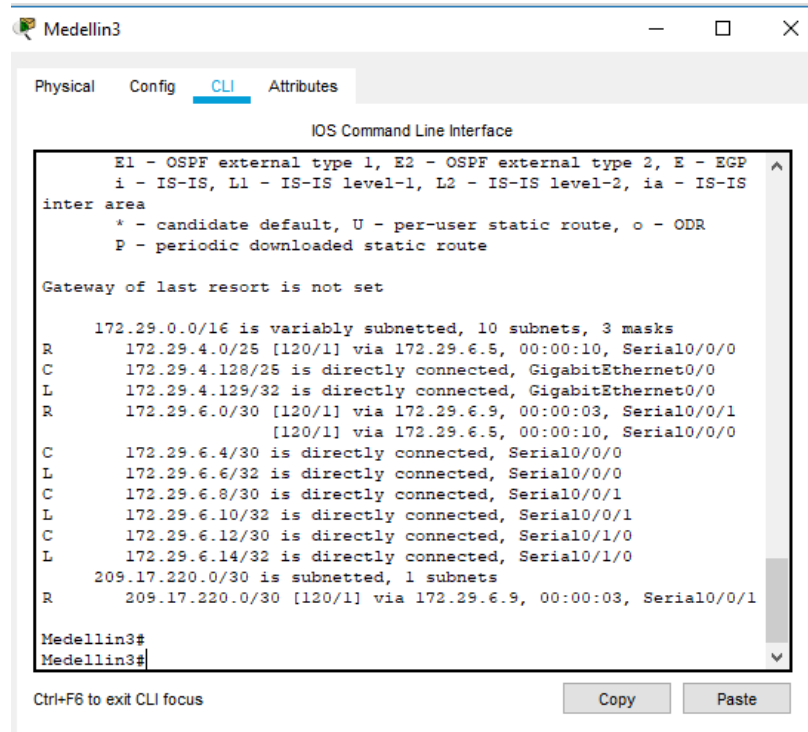
172.29.0.0/16 is variably subnetted, 9 subnets, 3 masks
C 172.29.4.0/25 is directly connected, GigabitEthernet0/0
L 172.29.4.128/32 is directly connected, GigabitEthernet0/0
R 172.29.4.128/25 [120/1] via 172.29.6.6, 00:00:15, Serial0/0/0
C 172.29.6.0/30 is directly connected, Serial0/0/1
L 172.29.6.1/32 is directly connected, Serial0/0/1
C 172.29.6.4/30 is directly connected, Serial0/0/0
L 172.29.6.5/32 is directly connected, Serial0/0/0
R 172.29.6.8/30 [120/1] via 172.29.6.6, 00:00:15, Serial0/0/0
R 172.29.6.12/30 [120/1] via 172.29.6.6, 00:00:15, Serial0/0/0
209.17.220.0/30 is subnetted, 1 subnets
R 209.17.220.0/30 [120/2] via 172.29.6.6, 00:00:15, Serial0/0/0

Medellin2#
Medellin2#
```

Buttons: Copy, Paste

Ctrl+F6 to exit CLI focus

Medellin3



The screenshot shows the Medellin3 CLI interface with the following content:

```
IOS Command Line Interface
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS
inter area
* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route

Gateway of last resort is not set

172.29.0.0/16 is variably subnetted, 10 subnets, 3 masks
R 172.29.4.0/25 [120/1] via 172.29.6.5, 00:00:10, Serial0/0/0
C 172.29.4.128/25 is directly connected, GigabitEthernet0/0
L 172.29.4.129/32 is directly connected, GigabitEthernet0/0
R 172.29.6.0/30 [120/1] via 172.29.6.9, 00:00:03, Serial0/0/1
[120/1] via 172.29.6.5, 00:00:10, Serial0/0/0
C 172.29.6.4/30 is directly connected, Serial0/0/0
L 172.29.6.6/32 is directly connected, Serial0/0/0
C 172.29.6.8/30 is directly connected, Serial0/0/1
L 172.29.6.10/32 is directly connected, Serial0/0/1
C 172.29.6.12/30 is directly connected, Serial0/1/0
L 172.29.6.14/32 is directly connected, Serial0/1/0
209.17.220.0/30 is subnetted, 1 subnets
R 209.17.220.0/30 [120/1] via 172.29.6.9, 00:00:03, Serial0/0/1

Medellin3#
Medellin3#
```

Buttons: Copy, Paste

Ctrl+F6 to exit CLI focus

Bogota1

```
inter area
* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route

Gateway of last resort is 209.17.220.6 to network 0.0.0.0

    172.29.0.0/16 is variably subnetted, 9 subnets, 3 masks
R    172.29.0.0/24 [120/1] via 172.29.3.6, 00:00:12, Serial0/0/0
    [120/1] via 172.29.3.2, 00:00:12, Serial0/1/1
R    172.29.1.0/24 [120/2] via 172.29.3.6, 00:00:12, Serial0/0/0
    [120/2] via 172.29.3.2, 00:00:12, Serial0/1/1
C    172.29.3.0/30 is directly connected, Serial0/1/1
L    172.29.3.1/32 is directly connected, Serial0/1/1
C    172.29.3.4/30 is directly connected, Serial0/0/0
L    172.29.3.5/32 is directly connected, Serial0/0/0
C    172.29.3.8/30 is directly connected, Serial0/0/1
L    172.29.3.9/32 is directly connected, Serial0/0/1
R    172.29.3.12/30 [120/1] via 172.29.3.6, 00:00:12, Serial0/0/0
    [120/1] via 172.29.3.2, 00:00:12, Serial0/1/1
    209.17.220.0/24 is variably subnetted, 2 subnets, 2 masks
C    209.17.220.4/30 is directly connected, Serial0/1/0
L    209.17.220.5/32 is directly connected, Serial0/1/0
S*  0.0.0.0/0 [1/0] via 209.17.220.6

Bogota1#
```

Bogota2

```
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS

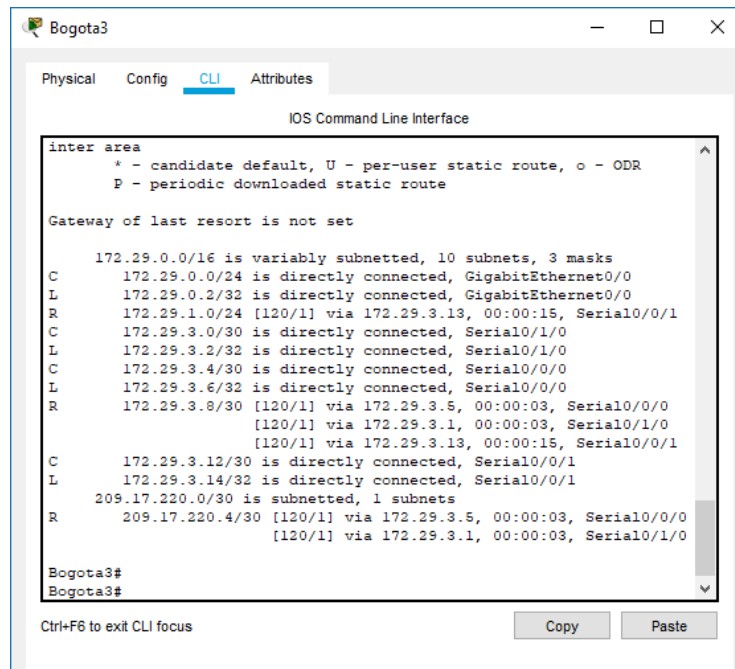
inter area
* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route

Gateway of last resort is not set

    172.29.0.0/16 is variably subnetted, 9 subnets, 3 masks
R    172.29.0.0/24 [120/1] via 172.29.3.14, 00:00:19, Serial0/0/0
C    172.29.1.0/24 is directly connected, GigabitEthernet0/0
L    172.29.1.2/32 is directly connected, GigabitEthernet0/0
R    172.29.3.0/30 [120/1] via 172.29.3.14, 00:00:19, Serial0/0/0
R    172.29.3.4/30 [120/1] via 172.29.3.14, 00:00:19, Serial0/0/0
C    172.29.3.8/30 is directly connected, Serial0/0/1
L    172.29.3.9/32 is directly connected, Serial0/0/1
C    172.29.3.12/30 is directly connected, Serial0/0/0
L    172.29.3.13/32 is directly connected, Serial0/0/0
    209.17.220.0/30 is subnetted, 1 subnets
R    209.17.220.4/30 [120/2] via 172.29.3.14, 00:00:19,
Serial0/0/0

Bogota2#
Bogota2#
```

Bogota3



The screenshot shows a window titled "Bogota3" with tabs for "Physical", "Config", "CLI", and "Attributes". The "CLI" tab is active, displaying the "IOS Command Line Interface". The output of the "show ip route" command is as follows:

```
inter area
* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route

Gateway of last resort is not set

172.29.0.0/16 is variably subnetted, 10 subnets, 3 masks
C    172.29.0.0/24 is directly connected, GigabitEthernet0/0
L    172.29.0.2/32 is directly connected, GigabitEthernet0/0
R    172.29.1.0/24 [120/1] via 172.29.3.13, 00:00:15, Serial0/0/1
C    172.29.3.0/30 is directly connected, Serial0/1/0
L    172.29.3.2/32 is directly connected, Serial0/1/0
C    172.29.3.4/30 is directly connected, Serial0/0/0
L    172.29.3.6/32 is directly connected, Serial0/0/0
R    172.29.3.8/30 [120/1] via 172.29.3.5, 00:00:03, Serial0/0/0
      [120/1] via 172.29.3.1, 00:00:03, Serial0/1/0
      [120/1] via 172.29.3.13, 00:00:15, Serial0/0/1
C    172.29.3.12/30 is directly connected, Serial0/0/1
L    172.29.3.14/32 is directly connected, Serial0/0/1
209.17.220.0/30 is subnetted, 1 subnets
R    209.17.220.4/30 [120/1] via 172.29.3.5, 00:00:03, Serial0/0/0
      [120/1] via 172.29.3.1, 00:00:03, Serial0/1/0

Bogota3#
Bogota3#
```

At the bottom of the window, there is a "Ctrl+F6 to exit CLI focus" label and two buttons: "Copy" and "Paste".

Parte 3: Deshabilitar la propagación del protocolo RIP.

a. Para no propagar las publicaciones por interfaces que no lo requieran se debe deshabilitar la propagación del protocolo RIP, en la siguiente tabla se indican las interfaces de cada router que no necesitan desactivación.

ROUTER	INTERFAZ
Bogota1	SERIALo/0/1; SERIALo/1/0; SERIALo/1/1
Bogota2	SERIALo/0/0; SERIALo/0/1
Bogota3	SERIALo/0/0; SERIALo/0/1; SERIALo/1/0
Medellín1	SERIALo/0/0; SERIALo/0/1; SERIALo/1/1
Medellín2	SERIALo/0/0; SERIALo/0/1
Medellín3	SERIALo/0/0; SERIALo/0/1; SERIALo/1/0
ISP	No lo requiere

Bogota1

User Access Verification

Password:

```
Bogota1>en
Password:
Bogota1#config t
Enter configuration commands, one per line. End with CNTL/Z.
Bogota1(config)#router rip
Bogota1(config-router)#passive-interface Serial0/0/0
Bogota1(config-router)#end
Bogota1#
%SYS-5-CONFIG_I: Configured from console by console
```

Bogota2

User Access Verification

Password:

```
Bogota2>en
Password:
Bogota2#config t
Enter configuration commands, one per line. End with CNTL/Z.
Bogota2(config)#router rip
```

```
Bogota2(config-router)#passive-interface g0/0
Bogota2(config-router)#end
Bogota2#
%SYS-5-CONFIG_I: Configured from console by console
```

Bogota3

User Access Verification

Password:

```
Bogota3>en
Password:
Bogota3#config t
Enter configuration commands, one per line. End with CNTL/Z.
Bogota3(config)#router rip
Bogota3(config-router)#passive-interface g0/0
Bogota3(config-router)#passive-interface s0/1/1
Bogota3(config-router)#end
Bogota3#
%SYS-5-CONFIG_I: Configured from console by console
```

Medellin1

User Access Verification

Password:

```
Medellin1>en
Password:
Medellin1#config t
Enter configuration commands, one per line. End with CNTL/Z.
Medellin1(config)#router rip
Medellin1(config-router)#passive-interface s0/1/1
Medellin1(config-router)#end
Medellin1#
%SYS-5-CONFIG_I: Configured from console by console
```

Medellin2

User Access Verification

Password:

```
Medellin2>en
Password:
```

```
Medellin2#config t
Enter configuration commands, one per line. End with CNTL/Z.
Medellin2(config)#router rip
Medellin2(config-router)#passive-interface g0/0
Medellin2(config-router)#end
Medellin2#
%SYS-5-CONFIG_I: Configured from console by console
```

Medellin3

User Access Verification

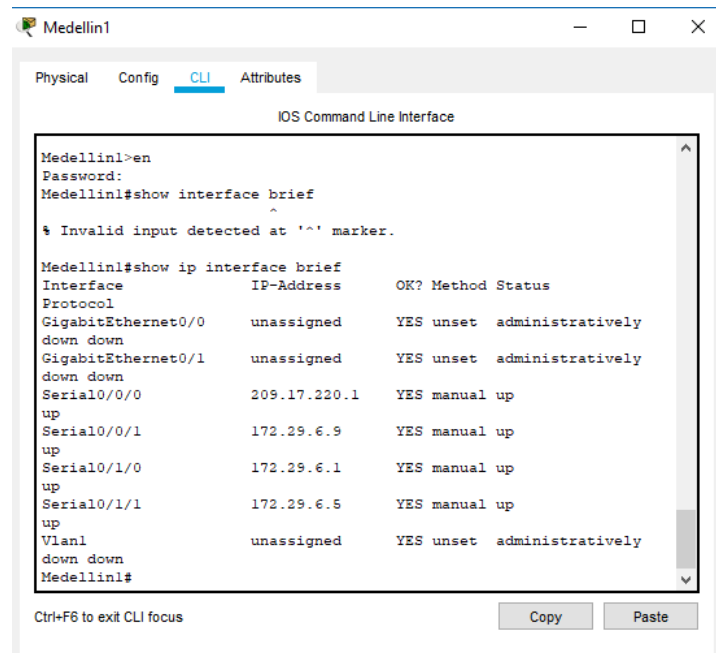
Password:

```
Medellin3>en
Password:
Medellin3#router rip
^
% Invalid input detected at '^' marker.
Medellin3#config t
Enter configuration commands, one per line. End with CNTL/Z.
Medellin3(config)#router rip
Medellin3(config-router)#passive-interface g 0/0
Medellin3(config-router)#passive-interface s0/1/1
Medellin3(config-router)#end
Medellin3#
%SYS-5-CONFIG_I: Configured from console by console
```

Parte 4: Verificación del protocolo RIP.

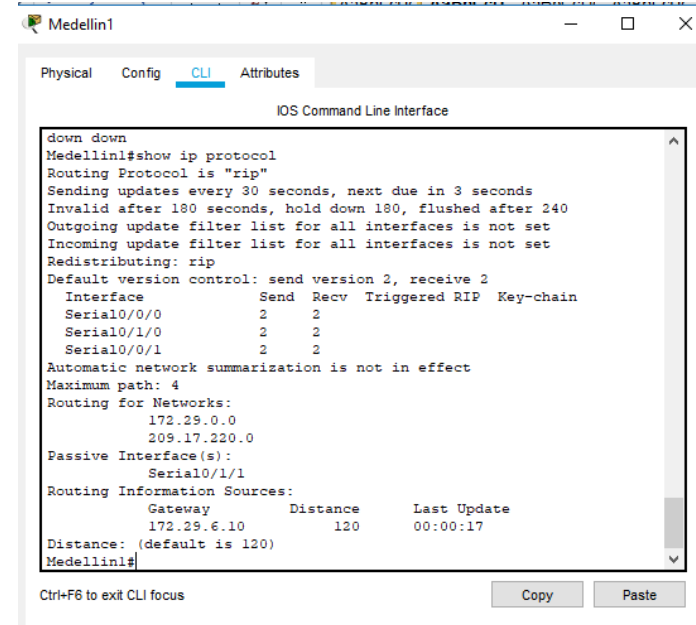
- Verificar y documentar las opciones de enrutamiento configuradas en los routers, como el passive interface para la conexión hacia el ISP, la versión de RIP y las interfaces que participan de la publicación entre otros datos.
- Verificar y documentar la base de datos de RIP de cada router, donde se informa de manera detallada de todas las rutas hacia cada red.

Medellin1



```
Medellin1>en
Password:
Medellin1#show interface brief
^
% Invalid input detected at '^' marker.

Medellin1#show ip interface brief
Interface          IP-Address      OK? Method Status
Protocol
GigabitEthernet0/0 unassigned      YES unset  administratively
down down
GigabitEthernet0/1 unassigned      YES unset  administratively
down down
Serial0/0/0        209.17.220.1   YES manual up
up
Serial0/0/1        172.29.6.9     YES manual up
up
Serial0/1/0        172.29.6.1     YES manual up
up
Serial0/1/1        172.29.6.5     YES manual up
up
Vlan1              unassigned      YES unset  administratively
down down
Medellin1#
```



```
down down
Medellin1#show ip protocol
Routing Protocol is "rip"
Sending updates every 30 seconds, next due in 3 seconds
Invalid after 180 seconds, hold down 180, flushed after 240
Outgoing update filter list for all interfaces is not set
Incoming update filter list for all interfaces is not set
Redistributing: rip
Default version control: send version 2, receive 2
  Interface          Send Recv  Triggered RIP  Key-chain
Serial0/0/0          2      2
Serial0/1/0          2      2
Serial0/0/1          2      2
Automatic network summarization is not in effect
Maximum path: 4
Routing for Networks:
  172.29.0.0
  209.17.220.0
Passive Interface(s):
  Serial0/1/1
Routing Information Sources:
  Gateway         Distance    Last Update
  172.29.6.10     120        00:00:17
Distance: (default is 120)
Medellin1#
```

Medellin2

Medellin2

Physical Config **CLI** Attributes

IOS Command Line Interface

```
User Access Verification
Password:
Medellin2>en
Password:
Medellin2#show ip interface brief
Interface          IP-Address      OK? Method Status
Protocol
GigabitEthernet0/0 172.29.4.126    YES manual up
up
GigabitEthernet0/1 unassigned      YES unset  administratively
down down
Serial0/0/0         172.29.6.5      YES manual up
up
Serial0/0/1         172.29.6.1      YES manual up
up
Serial0/1/0         unassigned      YES manual administratively
down down
Serial0/1/1         unassigned      YES unset  administratively
down down
Vlan1               unassigned      YES unset  administratively
down down
Medellin2#
```

Ctrl+F6 to exit CLI focus

Copy Paste

Medellin2

Physical Config **CLI** Attributes

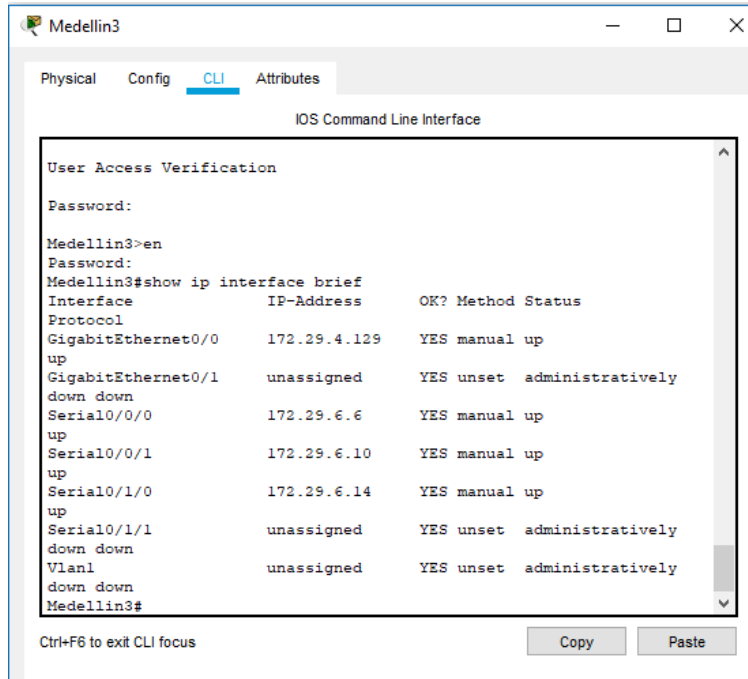
IOS Command Line Interface

```
Vlan1              unassigned      YES unset  administratively
down down
Medellin2#show ip protocol
Routing Protocol is "rip"
Sending updates every 30 seconds, next due in 0 seconds
Invalid after 180 seconds, hold down 180, flushed after 240
Outgoing update filter list for all interfaces is not set
Incoming update filter list for all interfaces is not set
Redistributing: rip
Default version control: send version 2, receive 2
  Interface        Send  Recv  Triggered RIP  Key-chain
  Serial0/0/1      2    2
  Serial0/0/0      2    2
Automatic network summarization is not in effect
Maximum path: 4
Routing for Networks:
  172.26.0.0
  172.29.0.0
Passive Interface(s):
  GigabitEthernet0/0
Routing Information Sources:
  Gateway         Distance    Last Update
  172.29.6.6      120         00:00:20
Distance: (default is 120)
Medellin2#
```

Ctrl+F6 to exit CLI focus

Copy Paste

Medellin3



Medellin3

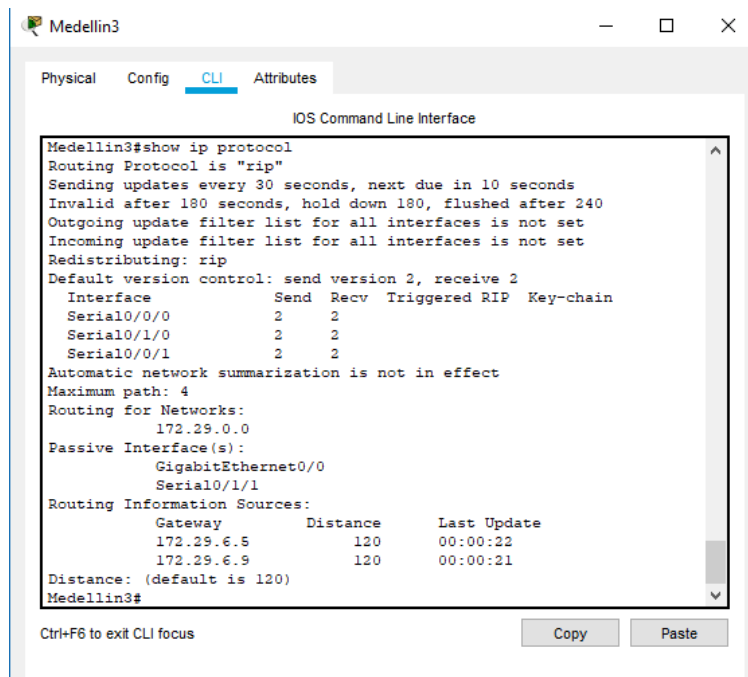
Physical Config **CLI** Attributes

IOS Command Line Interface

```
User Access Verification
Password:
Medellin3>en
Password:
Medellin3#show ip interface brief
Interface          IP-Address      OK? Method Status
Protocol
GigabitEthernet0/0 172.29.4.129    YES manual up
GigabitEthernet0/1 unassigned      YES unset  administratively
down down
Serial0/0/0        172.29.6.6     YES manual up
Serial0/0/1        172.29.6.10    YES manual up
Serial0/1/0        172.29.6.14    YES manual up
Serial0/1/1        unassigned      YES unset  administratively
down down
Vlan1              unassigned      YES unset  administratively
down down
Medellin3#
```

Ctrl+F6 to exit CLI focus

Copy Paste



Medellin3

Physical Config **CLI** Attributes

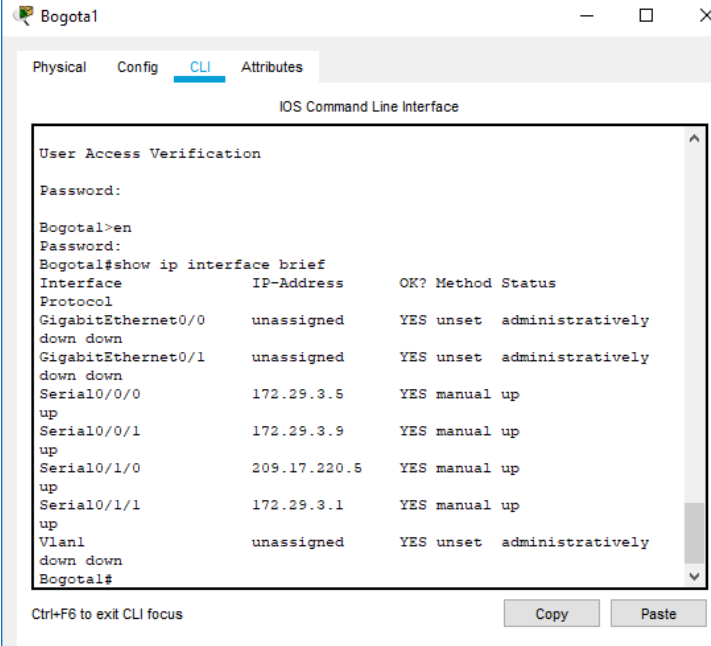
IOS Command Line Interface

```
Medellin3#show ip protocol
Routing Protocol is "rip"
Sending updates every 30 seconds, next due in 10 seconds
Invalid after 180 seconds, hold down 180, flushed after 240
Outgoing update filter list for all interfaces is not set
Incoming update filter list for all interfaces is not set
Redistributing: rip
Default version control: send version 2, receive 2
Interface          Send Recv  Triggered RIP  Key-chain
Serial0/0/0        2      2
Serial0/1/0        2      2
Serial0/0/1        2      2
Automatic network summarization is not in effect
Maximum path: 4
Routing for Networks:
 172.29.0.0
Passive Interface(s):
 GigabitEthernet0/0
 Serial0/1/1
Routing Information Sources:
 Gateway          Distance    Last Update
 172.29.6.5       120        00:00:22
 172.29.6.9       120        00:00:21
Distance: (default is 120)
Medellin3#
```

Ctrl+F6 to exit CLI focus

Copy Paste

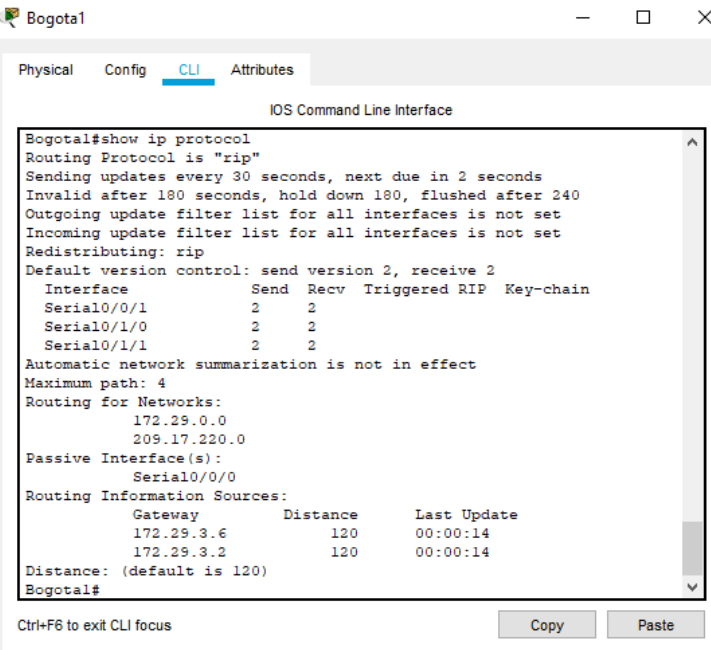
Bogota1



The screenshot shows the CLI interface of a device named Bogota1. The 'CLI' tab is selected. The command 'show ip interface brief' has been executed, displaying the following output:

```
User Access Verification
Password:
Bogotal>en
Password:
Bogotal#show ip interface brief
Interface          IP-Address      OK? Method Status
Protocol
GigabitEthernet0/0 unassigned     YES unset  administratively
down down
GigabitEthernet0/1 unassigned     YES unset  administratively
down down
Serial0/0/0        172.29.3.5     YES manual up
up
Serial0/0/1        172.29.3.9     YES manual up
up
Serial0/1/0        209.17.220.5   YES manual up
up
Serial0/1/1        172.29.3.1     YES manual up
up
Vlan1              unassigned     YES unset  administratively
down down
Bogotal#
```

Below the terminal window, there are buttons for 'Copy' and 'Paste', and a note: 'Ctrl+F6 to exit CLI focus'.



The screenshot shows the CLI interface of a device named Bogota1. The 'CLI' tab is selected. The command 'show ip protocol' has been executed, displaying the following output:

```
Bogotal#show ip protocol
Routing Protocol is "rip"
Sending updates every 30 seconds, next due in 2 seconds
Invalid after 180 seconds, hold down 180, flushed after 240
Outgoing update filter list for all interfaces is not set
Incoming update filter list for all interfaces is not set
Redistributing: rip
Default version control: send version 2, receive 2
  Interface        Send Recv Triggered RIP Key-chain
Serial0/0/1        2    2
Serial0/1/0        2    2
Serial0/1/1        2    2
Automatic network summarization is not in effect
Maximum path: 4
Routing for Networks:
  172.29.0.0
  209.17.220.0
Passive Interface(s):
  Serial0/0/0
Routing Information Sources:
  Gateway         Distance    Last Update
172.29.3.6        120         00:00:14
172.29.3.2        120         00:00:14
Distance: (default is 120)
Bogotal#
```

Below the terminal window, there are buttons for 'Copy' and 'Paste', and a note: 'Ctrl+F6 to exit CLI focus'.

Bogota2

The screenshot shows the CLI interface of a device named Bogota2. The 'CLI' tab is selected. The terminal displays the following output for the 'show ip interface brief' command:

```
User Access Verification
Password:
Bogota2>en
Password:
Bogota2#show ip interface brief
Interface          IP-Address      OK? Method Status
Protocol
GigabitEthernet0/0 172.29.1.2     YES manual up
up
GigabitEthernet0/1 unassigned     YES unset  administratively
down down
Serial0/0/0        172.29.3.13   YES manual up
up
Serial0/0/1        172.29.3.9    YES manual up
up
Serial0/1/0        unassigned     YES unset  administratively
down down
Serial0/1/1        unassigned     YES unset  administratively
down down
Vlan1              unassigned     YES unset  administratively
down down
Bogota2#
```

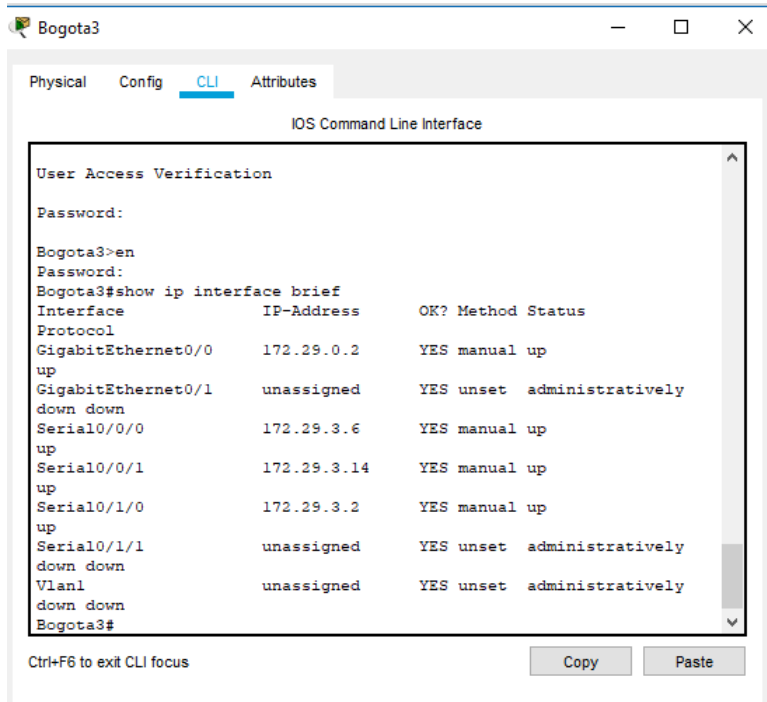
Below the terminal window, there are buttons for 'Copy' and 'Paste', and a note: 'Ctrl+F6 to exit CLI focus'.

The screenshot shows the CLI interface of a device named Bogota2. The 'CLI' tab is selected. The terminal displays the following output for the 'show ip protocol' command:

```
down down
Vlan1              unassigned     YES unset  administratively
down down
Bogota2#show ip protocol
Routing Protocol is "rip"
  Sending updates every 30 seconds, next due in 17 seconds
  Invalid after 180 seconds, hold down 180, flushed after 240
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Redistributing: rip
    Default version control: send version 2, receive 2
      Interface        Send  Recv  Triggered RIP  Key-chain
    Serial0/0/1        2    2
    Serial0/0/0        2    2
  Automatic network summarization is not in effect
  Maximum path: 4
  Routing for Networks:
    172.29.0.0
  Passive Interface(s):
    GigabitEthernet0/0
  Routing Information Sources:
    Gateway         Distance    Last Update
    172.29.3.14     120        00:00:05
  Distance: (default is 120)
Bogota2#
```

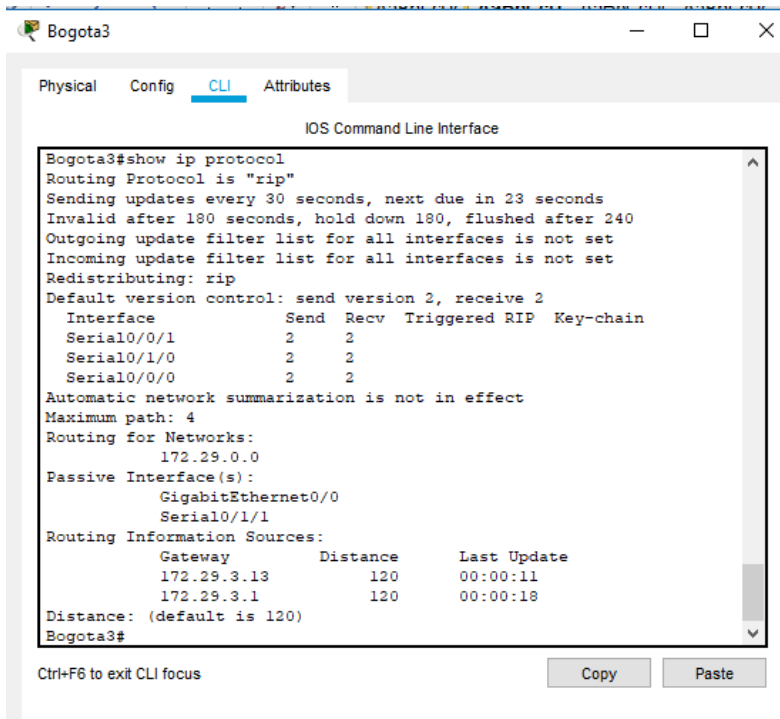
Below the terminal window, there are buttons for 'Copy' and 'Paste', and a note: 'Ctrl+F6 to exit CLI focus'.

Bogota3



The screenshot shows the CLI interface of a device named Bogota3. The 'CLI' tab is selected. The command 'show ip interface brief' has been executed, displaying a table of interface configurations. Below the table, there are 'Copy' and 'Paste' buttons, and a note 'Ctrl+F6 to exit CLI focus'.

```
User Access Verification
Password:
Bogota3>en
Password:
Bogota3#show ip interface brief
Interface          IP-Address      OK? Method Status
Protocol
GigabitEthernet0/0 172.29.0.2     YES manual up
up
GigabitEthernet0/1 unassigned     YES unset  administratively
down down
Serial0/0/0        172.29.3.6     YES manual up
up
Serial0/0/1        172.29.3.14    YES manual up
up
Serial0/1/0        172.29.3.2     YES manual up
up
Serial0/1/1        unassigned     YES unset  administratively
down down
Vlan1              unassigned     YES unset  administratively
down down
Bogota3#
```

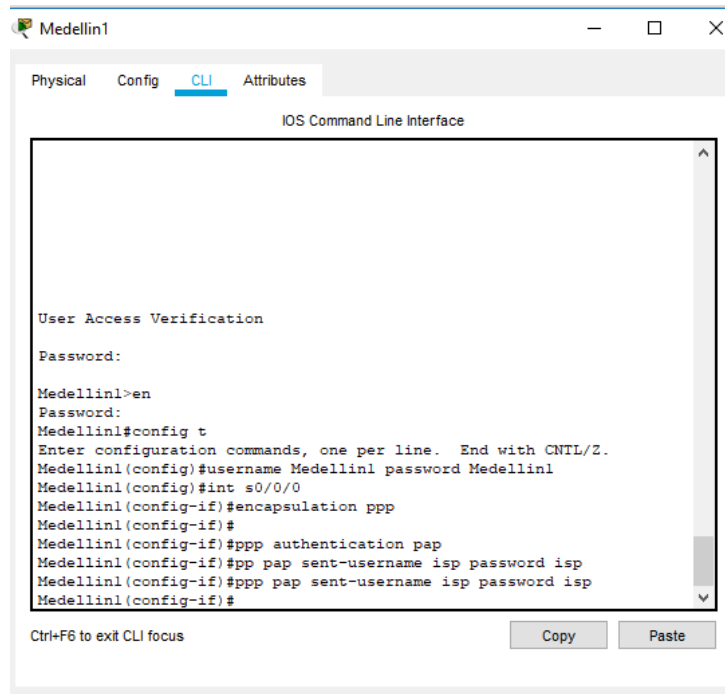


The screenshot shows the CLI interface of a device named Bogota3. The 'CLI' tab is selected. The command 'show ip protocol' has been executed, displaying detailed information about the RIP protocol configuration. Below the output, there are 'Copy' and 'Paste' buttons, and a note 'Ctrl+F6 to exit CLI focus'.

```
Bogota3#show ip protocol
Routing Protocol is "rip"
Sending updates every 30 seconds, next due in 23 seconds
Invalid after 180 seconds, hold down 180, flushed after 240
Outgoing update filter list for all interfaces is not set
Incoming update filter list for all interfaces is not set
Redistributing: rip
Default version control: send version 2, receive 2
Interface          Send Recv Triggered RIP Key-chain
Serial0/0/1        2      2
Serial0/1/0        2      2
Serial0/0/0        2      2
Automatic network summarization is not in effect
Maximum path: 4
Routing for Networks:
  172.29.0.0
Passive Interface(s):
  GigabitEthernet0/0
  Serial0/1/1
Routing Information Sources:
  Gateway          Distance      Last Update
  172.29.3.13      120          00:00:11
  172.29.3.1       120          00:00:18
Distance: (default is 120)
Bogota3#
```

Parte 5: Configurar encapsulamiento y autenticación PPP.

- a. Según la topología se requiere que el enlace Medellín1 con ISP sea configurado con autenticación PAT.

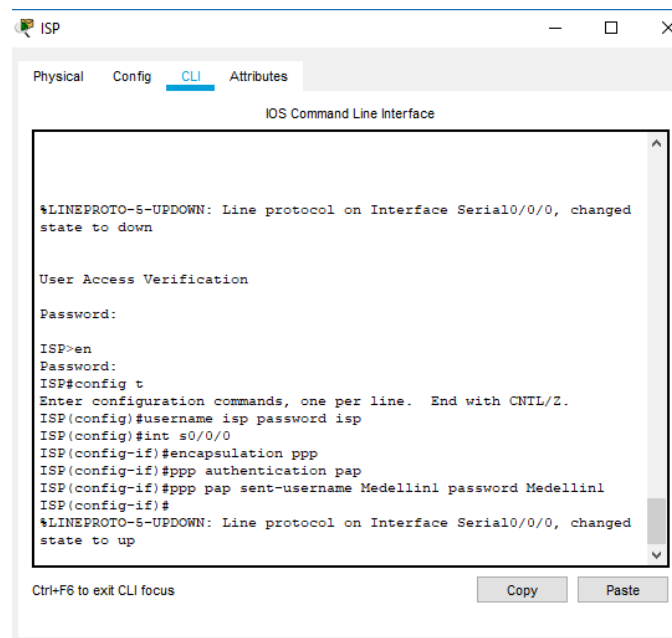


```
Medellin1
Physical Config CLI Attributes
IOS Command Line Interface

User Access Verification
Password:

Medellin1>en
Password:
Medellin1#config t
Enter configuration commands, one per line. End with CNTL/Z.
Medellin1(config)#username Medellin1 password Medellin1
Medellin1(config)#int s0/0/0
Medellin1(config-if)#encapsulation ppp
Medellin1(config-if)#
Medellin1(config-if)#ppp authentication pap
Medellin1(config-if)#ppp pap sent-username isp password isp
Medellin1(config-if)#ppp pap sent-username isp password isp
Medellin1(config-if)#

Ctrl+F6 to exit CLI focus
```



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

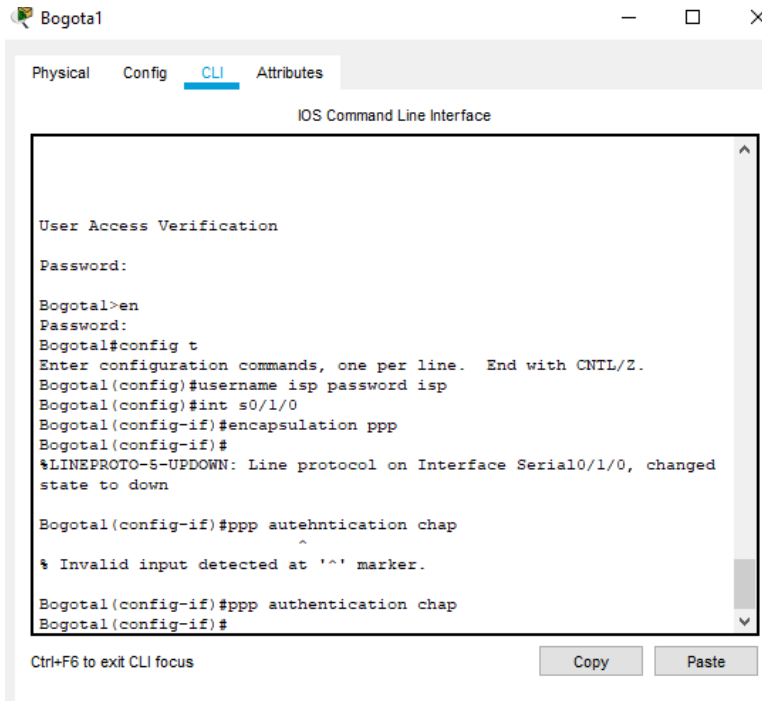
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed
state to down

User Access Verification
Password:

ISP>en
Password:
ISP#config t
Enter configuration commands, one per line. End with CNTL/Z.
ISP(config)#username isp password isp
ISP(config)#int s0/0/0
ISP(config-if)#encapsulation ppp
ISP(config-if)#ppp authentication pap
ISP(config-if)#ppp pap sent-username Medellin1 password Medellin1
ISP(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed
state to up

Ctrl+F6 to exit CLI focus
```

- b. El enlace Bogotá1 con ISP se debe configurar con autenticación CHAP.



```
Physical Config CLI Attributes
IOS Command Line Interface

User Access Verification
Password:

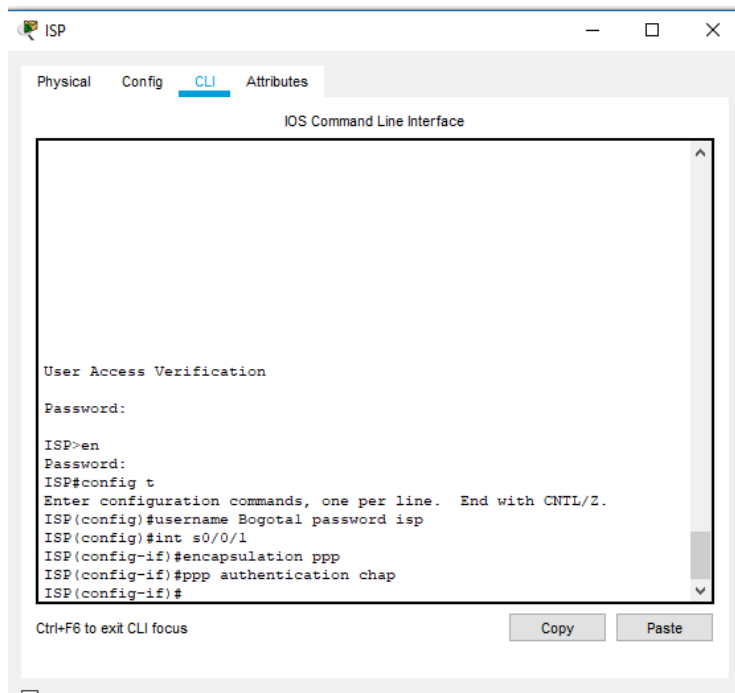
Bogotal>en
Password:
Bogotal#config t
Enter configuration commands, one per line. End with CNTL/Z.
Bogotal(config)#username isp password isp
Bogotal(config)#int s0/1/0
Bogotal(config-if)#encapsulation ppp
Bogotal(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1/0, changed
state to down

Bogotal(config-if)#ppp autehntication chap
^
% Invalid input detected at '^' marker.

Bogotal(config-if)#ppp authentication chap
Bogotal(config-if)#
```

Ctrl+F6 to exit CLI focus

Copy Paste



```
Physical Config CLI Attributes
IOS Command Line Interface

User Access Verification
Password:

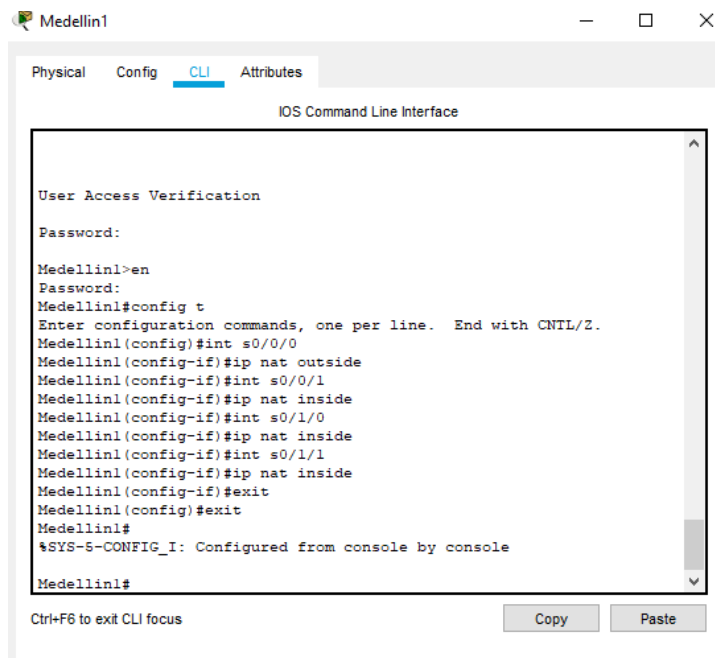
ISP>en
Password:
ISP#config t
Enter configuration commands, one per line. End with CNTL/Z.
ISP(config)#username Bogotal password isp
ISP(config)#int s0/0/1
ISP(config-if)#encapsulation ppp
ISP(config-if)#ppp authentication chap
ISP(config-if)#
```

Ctrl+F6 to exit CLI focus

Copy Paste

Parte 6: Configuración de PAT.

- a. En la topología, si se activa NAT en cada equipo de salida (Bogotá1 y Medellín1), los routers internos de una ciudad no podrán llegar hasta los routers internos en el otro extremo, sólo existirá comunicación hasta los routers Bogotá1, ISP y Medellín1.
- b. Después de verificar lo indicado en el paso anterior proceda a configurar el NAT en el router Medellín1. Compruebe que la traducción de direcciones indique las interfaces de entrada y de salida. Al realizar una prueba de ping, la dirección debe ser traducida automáticamente a la dirección de la interfaz serial 0/1/0 del router Medellín1, como diferente puerto.



```
Medellin1
Physical Config CLI Attributes
IOS Command Line Interface

User Access Verification
Password:

Medellin1>en
Password:
Medellin1#config t
Enter configuration commands, one per line. End with CNTL/Z.
Medellin1(config)#int s0/0/0
Medellin1(config-if)#ip nat outside
Medellin1(config-if)#int s0/0/1
Medellin1(config-if)#ip nat inside
Medellin1(config-if)#int s0/1/0
Medellin1(config-if)#ip nat inside
Medellin1(config-if)#int s0/1/1
Medellin1(config-if)#ip nat inside
Medellin1(config-if)#exit
Medellin1(config)#exit
Medellin1#
%SYS-5-CONFIG_I: Configured from console by console
Medellin1#
```

Ctrl+F6 to exit CLI focus

Copy Paste

```
Medellin1
Physical Config CLI Attributes
IOS Command Line Interface
interface Serial0/0/0
ip address 209.17.220.1 255.255.255.252
encapsulation ppp
ppp authentication pap
ppp pap sent-username isp password 0 isp
no keepalive
ip nat outside
clock rate 2000000
!
interface Serial0/0/1
ip address 172.29.6.9 255.255.255.252
ip nat inside
clock rate 2000000
!
interface Serial0/1/0
ip address 172.29.6.1 255.255.255.252
ip nat inside
!
interface Serial0/1/1
ip address 172.29.6.5 255.255.255.252
ip nat inside
clock rate 2000000
!
interface Vlan1
no ip address
!
Ctrl+F6 to exit CLI focus
Copy Paste
```

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

```
Bogota1
Physical Config CLI Attributes
IOS Command Line Interface
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1/0, changed
state to up

User Access Verification

Password:

Bogotal>en
Password:
Bogotal#config t
Enter configuration commands, one per line. End with CNTL/Z.
Bogotal(config)#int s0/1/0
Bogotal(config-if)#ip nat outside
Bogotal(config-if)#int s0/0/1
Bogotal(config-if)#ip nat inside
Bogotal(config-if)#int s0/0/0
Bogotal(config-if)#ip nat inside
Bogotal(config-if)#int s0/1/1
Bogotal(config-if)#ip nat inside
Bogotal(config-if)#exit
Bogotal(config)#exit
Bogotal#
%SYS-5-CONFIG_I: Configured from console by console

Ctrl+F6 to exit CLI focus
Copy Paste
```

Bogota1

Physical Config **CLI** Attributes

IOS Command Line Interface

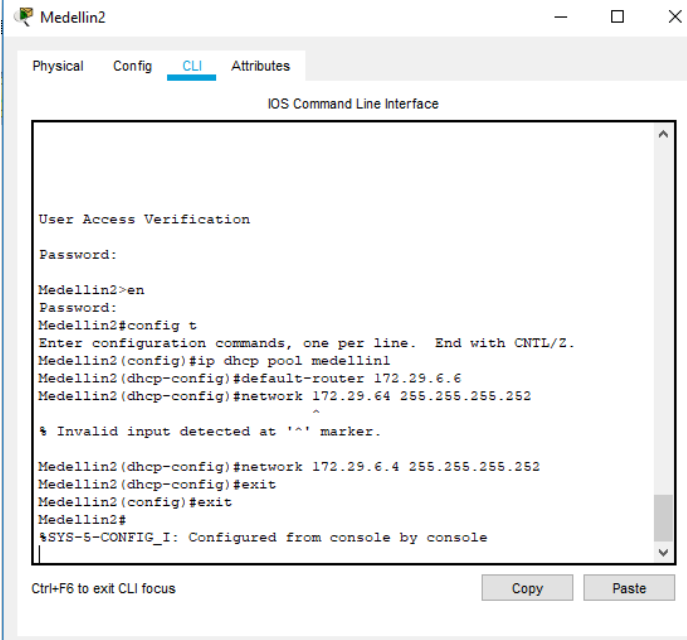
```
!
interface Serial0/0/0
ip address 172.29.3.5 255.255.255.252
ip nat inside
clock rate 2000000
!
interface Serial0/0/1
ip address 172.29.3.9 255.255.255.252
ip nat inside
clock rate 2000000
!
interface Serial0/1/0
ip address 209.17.220.5 255.255.255.252
encapsulation ppp
ppp authentication chap
no keepalive
ip nat outside
!
interface Serial0/1/1
ip address 172.29.3.1 255.255.255.252
ip nat inside
!
interface Vlan1
no ip address
--More--
```

Ctrl+F6 to exit CLI focus

Copy Paste

Parte 7: Configuración del servicio DHCP.

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



```
Medellin2
Physical Config CLI Attributes
IOS Command Line Interface

User Access Verification

Password:

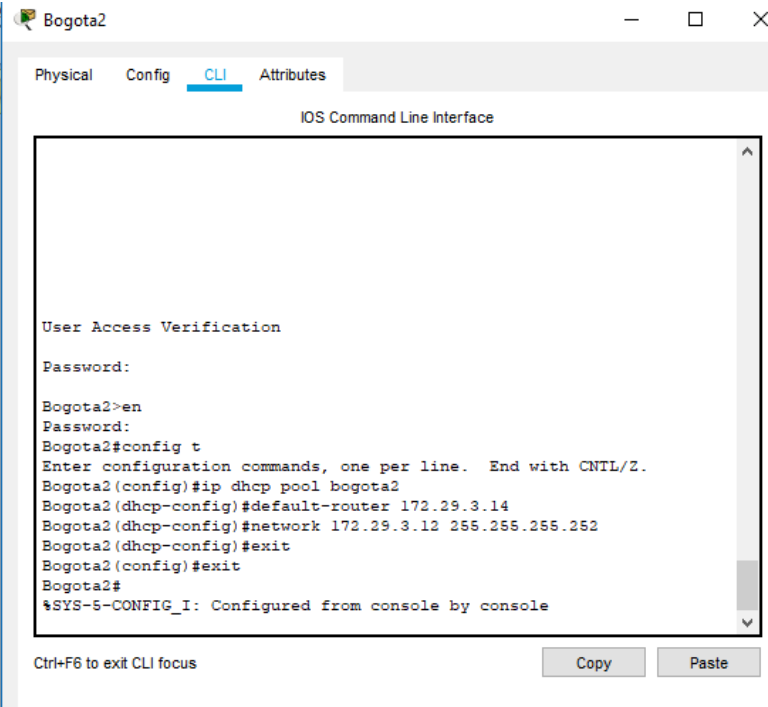
Medellin2>en
Password:
Medellin2#config t
Enter configuration commands, one per line. End with CNTL/Z.
Medellin2(config)#ip dhcp pool medellin1
Medellin2(dhcp-config)#default-router 172.29.6.6
Medellin2(dhcp-config)#network 172.29.64 255.255.255.252

% Invalid input detected at '^' marker.

Medellin2(dhcp-config)#network 172.29.6.4 255.255.255.252
Medellin2(dhcp-config)#exit
Medellin2(config)#exit
Medellin2#
%SYS-5-CONFIG_I: Configured from console by console

Ctrl+F6 to exit CLI focus
```

- Configurar la red Bogotá2 y Bogotá3 donde el router Bogota2 debe ser el servidor DHCP para ambas redes Lan.



```
Bogota2
Physical Config CLI Attributes
IOS Command Line Interface

User Access Verification

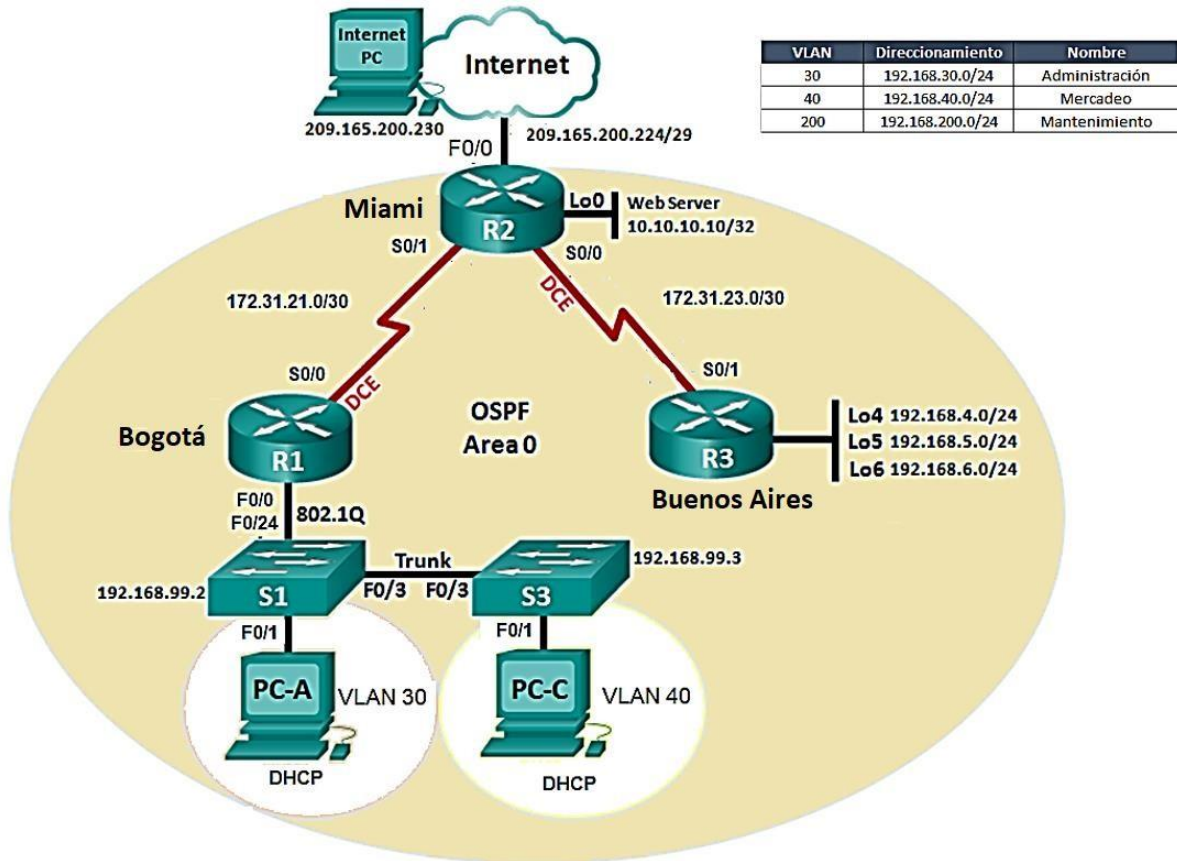
Password:

Bogota2>en
Password:
Bogota2#config t
Enter configuration commands, one per line. End with CNTL/Z.
Bogota2(config)#ip dhcp pool bogota2
Bogota2(dhcp-config)#default-router 172.29.3.14
Bogota2(dhcp-config)#network 172.29.3.12 255.255.255.252
Bogota2(dhcp-config)#exit
Bogota2(config)#exit
Bogota2#
%SYS-5-CONFIG_I: Configured from console by console

Ctrl+F6 to exit CLI focus
```

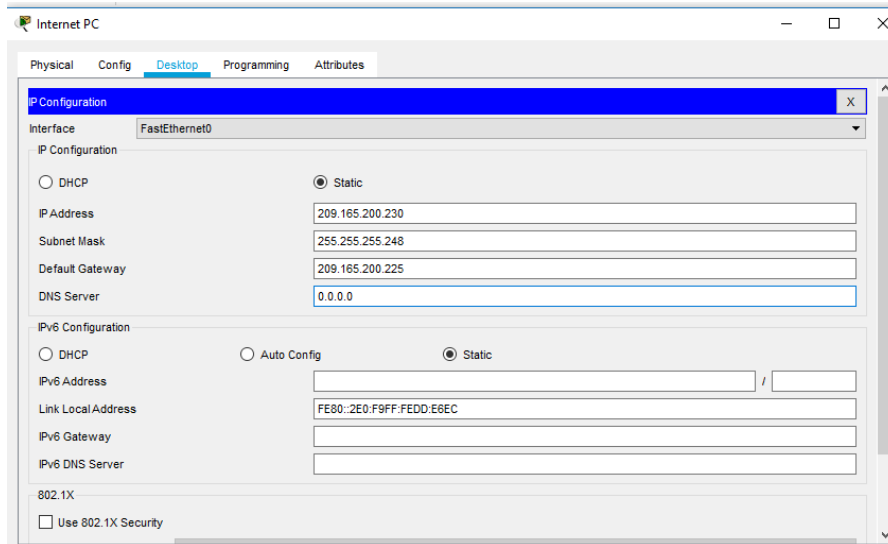
Escenario 2

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.

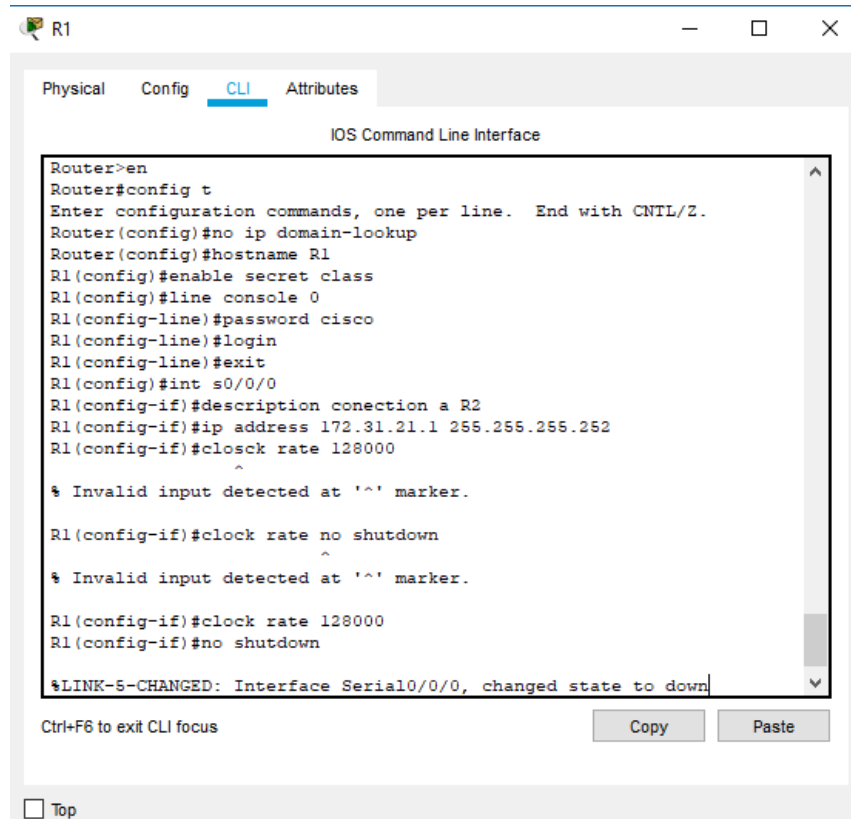


1. Configurar el direccionamiento IP acorde con la topología de red para cada uno de los dispositivos que forman parte del escenario

Internet PC



R1



R2

```
Press RETURN to get started!

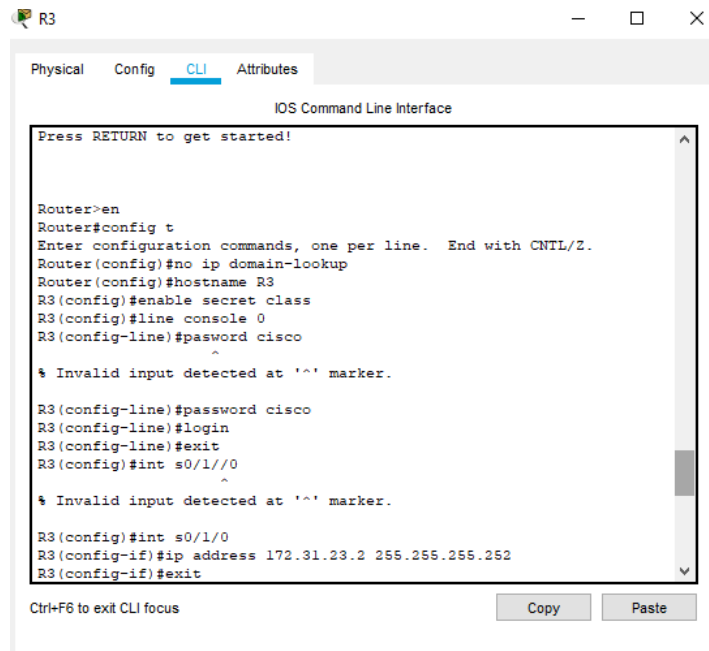
Router>en
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#no ip domain-lookup
Router(config)#hostname R2
R2(config)#enable secret class
R2(config)#line console 0
R2(config-line)#password cisco
R2(config-line)#login
R2(config-line)#exit
R2(config)#int s0/1/0
R2(config-if)#ip address 172.31.21.2 255.255.255.252
R2(config-if)#exit
R2(config)#int s0/0/0
R2(config-if)#ip address 172.31.23.1
% Incomplete command.
R2(config-if)#ip address 172.31.23.1 255.255.255.252
R2(config-if)#exit
R2(config)#int g0/1
R2(config-if)#10.10.10.1 255.255.255.0
^
% Invalid input detected at '^' marker.

R2(config-if)#ip address 10.10.10.1 255.255.255.0
R2(config-if)#exit
R2(config)#int g0/0
R2(config-if)#ip address 209.165.200.225 255.255.255.248
R2(config-if)#exit
R2(config)#
```

Ctrl+F6 to exit CLI focus

Copy Paste

R3



Physical Config **CLI** Attributes

IOS Command Line Interface

```
Press RETURN to get started!

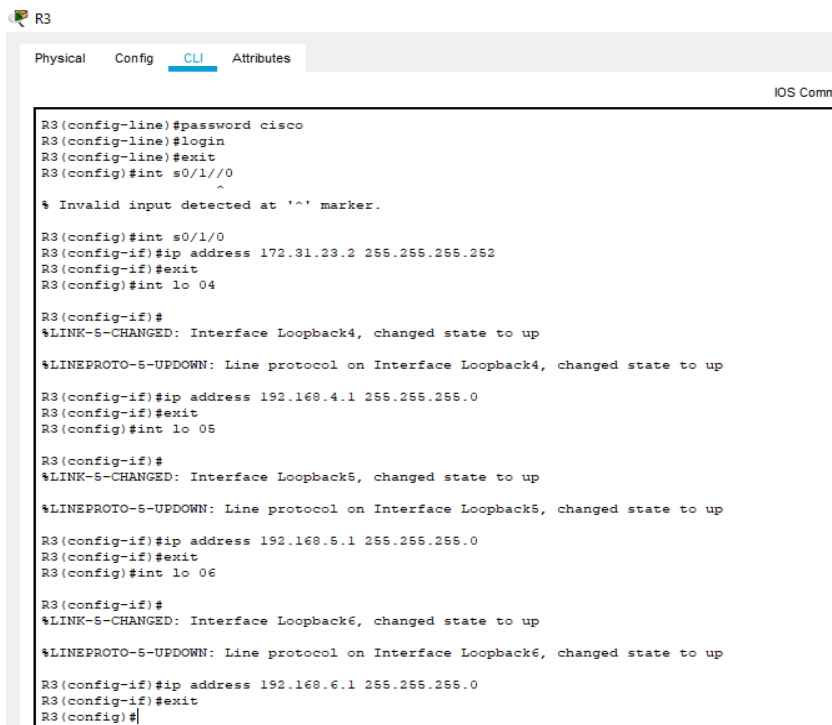
Router>en
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#no ip domain-lookup
Router(config)#hostname R3
R3(config)#enable secret class
R3(config)#line console 0
R3(config-line)#password cisco
^
% Invalid input detected at '^' marker.

R3(config-line)#password cisco
R3(config-line)#login
R3(config-line)#exit
R3(config)#int s0/1//0
^
% Invalid input detected at '^' marker.

R3(config)#int s0/1/0
R3(config-if)#ip address 172.31.23.2 255.255.255.252
R3(config-if)#exit
```

Ctrl+F6 to exit CLI focus

Copy Paste



Physical Config **CLI** Attributes

IOS Commr

```
R3(config-line)#password cisco
R3(config-line)#login
R3(config-line)#exit
R3(config)#int s0/1//0
^
% Invalid input detected at '^' marker.

R3(config)#int s0/1/0
R3(config-if)#ip address 172.31.23.2 255.255.255.252
R3(config-if)#exit
R3(config)#int lo 04

R3(config-if)#
%LINK-5-CHANGED: Interface Loopback4, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback4, changed state to up

R3(config-if)#ip address 192.168.4.1 255.255.255.0
R3(config-if)#exit
R3(config)#int lo 05

R3(config-if)#
%LINK-5-CHANGED: Interface Loopback5, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback5, changed state to up

R3(config-if)#ip address 192.168.5.1 255.255.255.0
R3(config-if)#exit
R3(config)#int lo 06

R3(config-if)#
%LINK-5-CHANGED: Interface Loopback6, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback6, changed state to up

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

PC-A

PC-A

Physical Config **Desktop** Programming Attributes

DHCP Static DHCP failed. APIPA is being used.

IP Address: 169.254.30.6

Subnet Mask: 255.255.0.0

Default Gateway: 0.0.0.0

DNS Server: 0.0.0.0

IPv6 Configuration

DHCP Auto Config Static

IPv6 Address: /

Link Local Address: FE80::207:ECFF:FEE5:1E06

IPv6 Gateway:

IPv6 DNS Server:

802.1X

Use 802.1X Security

Authentication: MD5

Username:

Password:

PC-C

PC-C

Physical Config **Desktop** Programming Attributes

DHCP Static DHCP failed. APIPA is being used.

IP Address: 169.254.40.36

Subnet Mask: 255.255.0.0

Default Gateway: 0.0.0.0

DNS Server: 0.0.0.0

IPv6 Configuration

DHCP Auto Config Static

IPv6 Address: /

Link Local Address: FE80::201:C7FF:FEC6:2824

IPv6 Gateway:

IPv6 DNS Server:

802.1X

Use 802.1X Security

Authentication: MD5

Username:

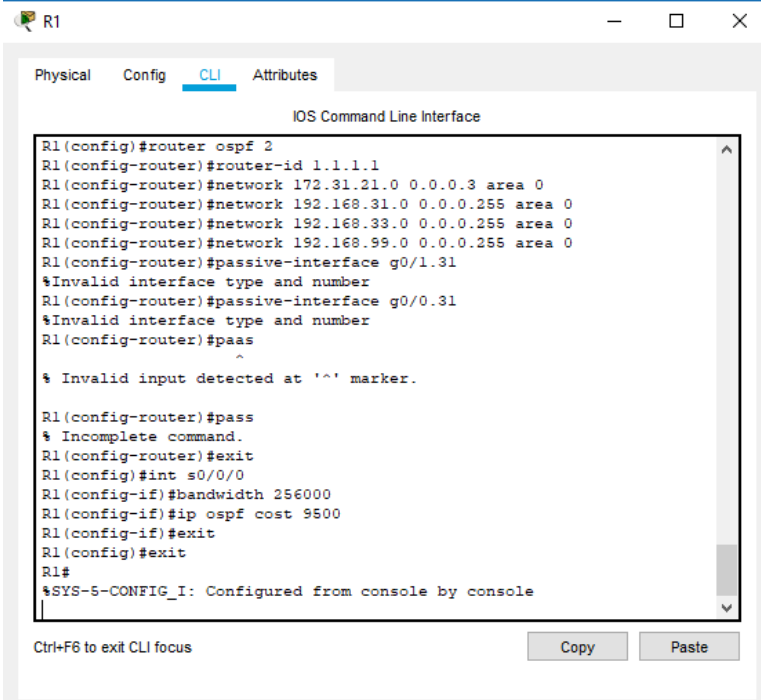
Password:

Top

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

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 So/o a	9500

R1



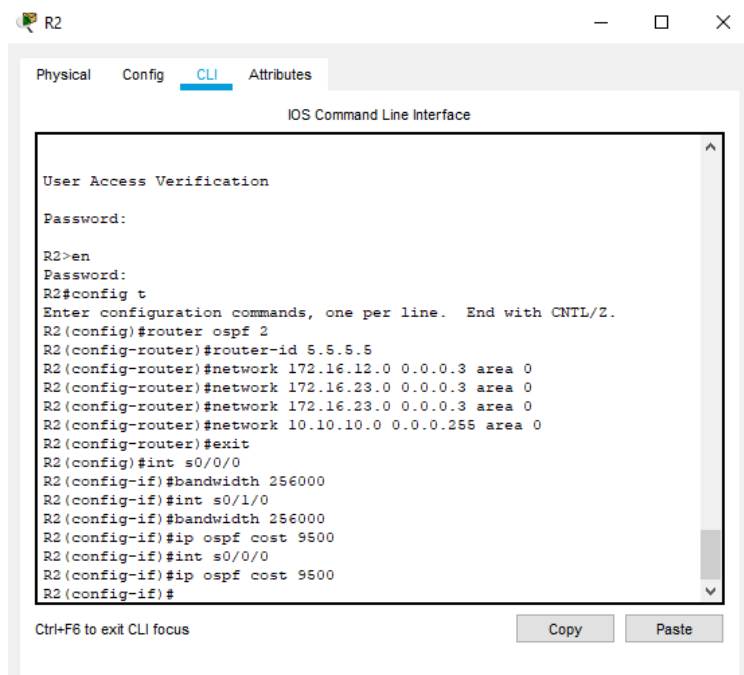
```
R1
Physical Config CLI Attributes
IOS Command Line Interface
R1(config)#router ospf 2
R1(config-router)#router-id 1.1.1.1
R1(config-router)#network 172.31.21.0 0.0.0.3 area 0
R1(config-router)#network 192.168.31.0 0.0.0.255 area 0
R1(config-router)#network 192.168.33.0 0.0.0.255 area 0
R1(config-router)#network 192.168.99.0 0.0.0.255 area 0
R1(config-router)#passive-interface g0/1.31
%Invalid interface type and number
R1(config-router)#passive-interface g0/0.31
%Invalid interface type and number
R1(config-router)#paas
^
% Invalid input detected at '^' marker.

R1(config-router)#pass
% Incomplete command.
R1(config-router)#exit
R1(config)#int s0/0/0
R1(config-if)#bandwidth 256000
R1(config-if)#ip ospf cost 9500
R1(config-if)#exit
R1(config)#exit
R1#
%SYS-5-CONFIG_I: Configured from console by console
```

Ctrl+F6 to exit CLI focus

Copy Paste

R2

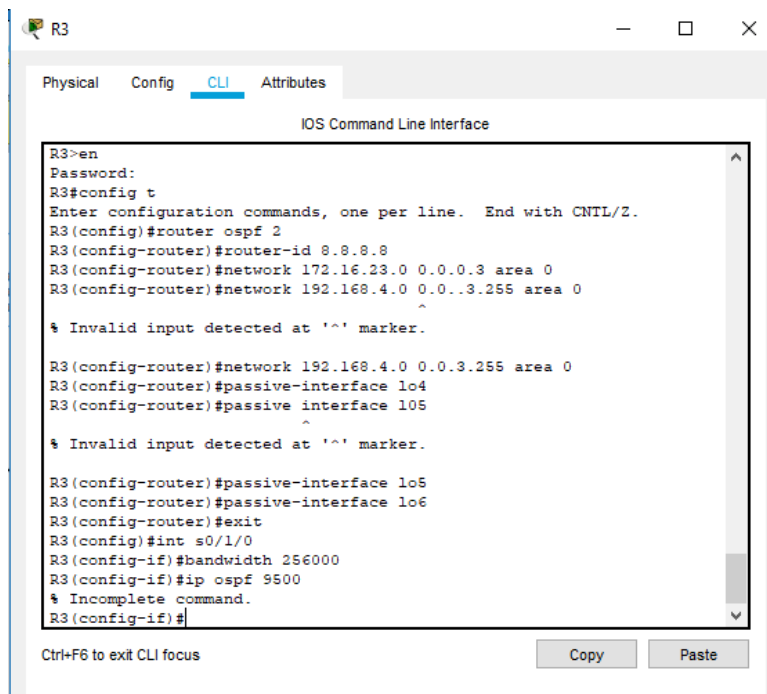


The screenshot shows a window titled 'R2' with tabs for 'Physical', 'Config', 'CLI', and 'Attributes'. The 'CLI' tab is active, displaying the 'IOS Command Line Interface'. The terminal output shows the following commands and responses:

```
User Access Verification
Password:
R2>en
Password:
R2#config t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#router ospf 2
R2(config-router)#router-id 5.5.5.5
R2(config-router)#network 172.16.12.0 0.0.0.3 area 0
R2(config-router)#network 172.16.23.0 0.0.0.3 area 0
R2(config-router)#network 172.16.23.0 0.0.0.3 area 0
R2(config-router)#network 10.10.10.0 0.0.0.255 area 0
R2(config-router)#exit
R2(config)#int s0/0/0
R2(config-if)#bandwidth 256000
R2(config-if)#int s0/1/0
R2(config-if)#bandwidth 256000
R2(config-if)#ip ospf cost 9500
R2(config-if)#int s0/0/0
R2(config-if)#ip ospf cost 9500
R2(config-if)#
```

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

R3



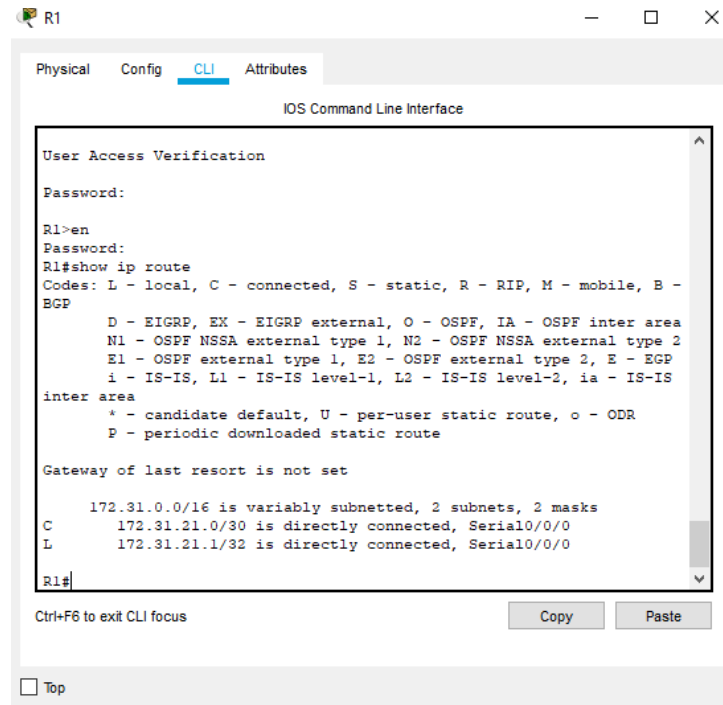
The screenshot shows a window titled 'R3' with tabs for 'Physical', 'Config', 'CLI', and 'Attributes'. The 'CLI' tab is active, displaying the 'IOS Command Line Interface'. The terminal output shows the following commands and responses:

```
R3>en
Password:
R3#config t
Enter configuration commands, one per line. End with CNTL/Z.
R3(config)#router ospf 2
R3(config-router)#router-id 8.8.8.8
R3(config-router)#network 172.16.23.0 0.0.0.3 area 0
R3(config-router)#network 192.168.4.0 0.0.0.3.255 area 0
^
% Invalid input detected at '^' marker.
R3(config-router)#network 192.168.4.0 0.0.0.3.255 area 0
R3(config-router)#passive-interface lo4
R3(config-router)#passive interface lo5
^
% Invalid input detected at '^' marker.
R3(config-router)#passive-interface lo5
R3(config-router)#passive-interface lo6
R3(config-router)#exit
R3(config)#int s0/1/0
R3(config-if)#bandwidth 256000
R3(config-if)#ip ospf 9500
% Incomplete command.
R3(config-if)#
```

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

Verificar información de OSPF

- Visualizar tablas de enrutamiento y routers conectados por OSPFv2



```
R1
Physical Config CLI Attributes
IOS Command Line Interface

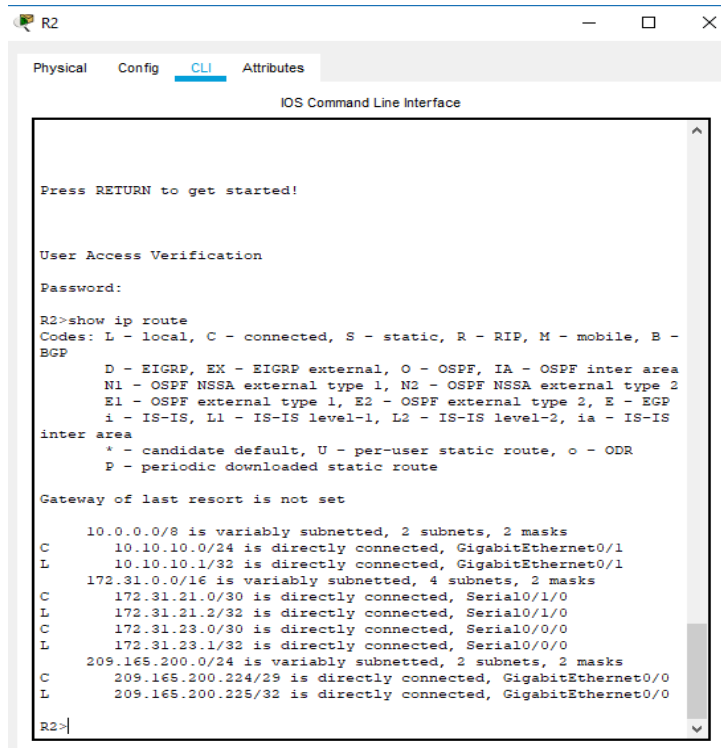
User Access Verification
Password:

R1>en
Password:
R1#show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B -
BGP
        D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
        N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
        E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
        i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS
inter area
        * - candidate default, U - per-user static route, o - ODR
        P - periodic downloaded static route

Gateway of last resort is not set

      172.31.0.0/16 is variably subnetted, 2 subnets, 2 masks
C       172.31.21.0/30 is directly connected, Serial0/0/0
L       172.31.21.1/32 is directly connected, Serial0/0/0

R1#
```



```
R2
Physical Config CLI Attributes
IOS Command Line Interface

Press RETURN to get started!

User Access Verification
Password:

R2>show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B -
BGP
        D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
        N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
        E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
        i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS
inter area
        * - candidate default, U - per-user static route, o - ODR
        P - periodic downloaded static route

Gateway of last resort is not set

      10.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C       10.10.10.0/24 is directly connected, GigabitEthernet0/1
L       10.10.10.1/32 is directly connected, GigabitEthernet0/1
      172.31.0.0/16 is variably subnetted, 4 subnets, 2 masks
C       172.31.21.0/30 is directly connected, Serial0/1/0
L       172.31.21.2/32 is directly connected, Serial0/1/0
C       172.31.23.0/30 is directly connected, Serial0/0/0
L       172.31.23.1/32 is directly connected, Serial0/0/0
      209.165.200.0/24 is variably subnetted, 2 subnets, 2 masks
C       209.165.200.224/29 is directly connected, GigabitEthernet0/0
L       209.165.200.225/32 is directly connected, GigabitEthernet0/0

R2>
```

```

R3
Physical Config CLI Attributes
IOS Command Line Interface

User Access Verification

Password:

R3>en
Password:
R3#show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B -
BGP
        D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
        N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
        E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
        I - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS
inter area
        * - candidate default, U - per-user static route, o - ODR
        P - periodic downloaded static route

Gateway of last resort is not set

172.31.0.0/16 is variably subnetted, 2 subnets, 2 masks
C    172.31.23.0/30 is directly connected, Serial0/1/0
L    172.31.23.2/32 is directly connected, Serial0/1/0
L    192.168.4.0/24 is variably subnetted, 2 subnets, 2 masks
C    192.168.4.0/24 is directly connected, Loopback4
L    192.168.4.1/32 is directly connected, Loopback4
L    192.168.5.0/24 is variably subnetted, 2 subnets, 2 masks
C    192.168.5.0/24 is directly connected, Loopback5
L    192.168.5.1/32 is directly connected, Loopback5
L    192.168.6.0/24 is variably subnetted, 2 subnets, 2 masks
C    192.168.6.0/24 is directly connected, Loopback6
L    192.168.6.1/32 is directly connected, Loopback6

R3#
Ctrl+F6 to exit CLI focus
Copy Paste

```

- 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.

```

R1
Physical Config CLI Attributes
IOS Command Line Interface

Gateway of last resort is not set

172.31.0.0/16 is variably subnetted, 2 subnets, 2 masks
C    172.31.21.0/30 is directly connected, Serial0/0/0
L    172.31.21.1/32 is directly connected, Serial0/0/0

R1#show ip ospf interface

Serial0/0/0 is up, line protocol is up
Internet address is 172.31.21.1/30, Area 0
Process ID 2, Router ID 1.1.1.1, Network Type POINT-TO-POINT, Cost:
9500
Transmit Delay is 1 sec, State POINT-TO-POINT, Priority 0
No designated router on this network
No backup designated router on this network
Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit
5
Hello due in 00:00:05
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
Suppress hello for 0 neighbor(s)

R1#
Ctrl+F6 to exit CLI focus
Copy Paste

```

R2

Physical Config **CLI** Attributes

IOS Command Line Interface

```
C 172.31.23.0/30 is directly connected, Serial0/0/0
L 172.31.23.1/32 is directly connected, Serial0/0/0
  209.165.200.0/24 is variably subnetted, 2 subnets, 2 masks
C 209.165.200.224/29 is directly connected, GigabitEthernet0/0
L 209.165.200.225/32 is directly connected, GigabitEthernet0/0

R2>show ip ospf interface

GigabitEthernet0/1 is up, line protocol is up
Internet address is 10.10.10.1/24, Area 0
Process ID 2, Router ID 5.5.5.5, Network Type BROADCAST, Cost: 1
Transmit Delay is 1 sec, State DR, Priority 1
Designated Router (ID) 5.5.5.5, Interface address 10.10.10.1
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 0, Adjacent neighbor count is 0
Suppress hello for 0 neighbor(s)
R2>
R2>
```

Ctrl+F6 to exit CLI focus

Copy Paste

R3

Physical Config **CLI** Attributes

IOS Command Line Interface

```
C 192.168.5.0/24 is directly connected, Loopback5
L 192.168.5.1/32 is directly connected, Loopback5
  192.168.6.0/24 is variably subnetted, 2 subnets, 2 masks
C 192.168.6.0/24 is directly connected, Loopback6
L 192.168.6.1/32 is directly connected, Loopback6

R3#show ip ospf interface
^
% Invalid input detected at '^' marker.

R3#show ip ospf interface

Loopback4 is up, line protocol is up
Internet address is 192.168.4.1/24, Area 0
Process ID 2, Router ID 8.8.8.8, Network Type LOOPBACK, Cost: 1
Loopback interface is treated as a stub Host
Loopback5 is up, line protocol is up
Internet address is 192.168.5.1/24, Area 0
Process ID 2, Router ID 8.8.8.8, Network Type LOOPBACK, Cost: 1
Loopback interface is treated as a stub Host
Loopback6 is up, line protocol is up
Internet address is 192.168.6.1/24, Area 0
Process ID 2, Router ID 8.8.8.8, Network Type LOOPBACK, Cost: 1
Loopback interface is treated as a stub Host
R3#
```

Ctrl+F6 to exit CLI focus

Copy Paste

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

4. En el Switch 3 deshabilitar DNS lookup

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

S1

```
Switch>en
Switch#config t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname S1
S1(config)#no ip domain-lookup
S1(config)#enable secret class
S1(config)#line console 0
S1(config-line)#password cisco
S1(config-line)#login
S1(config-line)#exit
S1(config)#vlan
% Incomplete command.
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)#int vlan 30
S1(config-if)#
%LINK-5-CHANGED: Interface Vlan30, changed state to up

S1(config-if)#int vlan 30
S1(config-if)#ip address 192.168.99.2 255.255.255.0
S1(config-if)#no shut
S1(config-if)#exit
S1(config)#ip default gateway 192.168.99.1
^
% Invalid input detected at '^' marker.
S1(config)#ip default
% Incomplete command.
S1(config)#ip default-gateway 192.168.99.1
S1(config)#int f0/1
S1(config-if)#switchport trunk native vlan 1
S1(config-if)#int f0/24
S1(config-if)#switchport trunk native vlan 1
```

S3

```
Switch>en
Switch#config t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname S3
S3(config)#no ip domain-lookup
S3(config)#enable secret class
S3(config)#line console 0
S3(config-line)#password cisco
S3(config-line)#login
S3(config-line)#exit
S3(config)#vlan 40
S3(config-vlan)#name mercadeo
S3(config-vlan)#vlan 30
S3(config-vlan)#name administracion
S3(config-vlan)#vlan 200
S3(config-vlan)#name mantenimiento
S3(config-vlan)#exit
S3(config)#int vlan 30
S3(config-if)#
%LINK-5-CHANGED: Interface Vlan30, changed state to up
S3(config-if)#ip address 192.168.99.3 255.255.255.0
S3(config-if)#no shut
S3(config-if)#exit
S3(config)#
```

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.*

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

R1

Physical Config **CLI** Attributes

IOS Command Line Interface

```
User Access Verification
Password:
R1>en
Password:
R1#config t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#ip dhcp excluded-address 192.168.30.1 192.168.30.30
R1(config)#ip dhcp excluded-address 192.168.40.1 192.168.40.30
R1(config)#ip dhcp pool administracion
R1(dhcp-config)#dns-server 10.10.10.11
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 mercadeo
R1(dhcp-config)#dns-server
% Incomplete command.
R1(dhcp-config)#dns-server 10.10.10.11
R1(dhcp-config)#default-router 192.168.40.1
R1(dhcp-config)#network 192.168.40.0 255.255.255.0
R1(dhcp-config)#
```

Ctrl+F6 to exit CLI focus

Copy Paste

Conclusiones

- Conocer las diferentes topologías de red, permite comprender el funcionamiento de una red y cómo se comportan cada uno de los dispositivos dentro de esta misma.
- Es importante conocer cada dispositivo usado en cada escenario, para realizar las conexiones adecuadas y correctas entre estos, permitiendo el correcto funcionamiento de los dispositivos ya si alcanzar y cumplir los objetivos de aprendizaje de la actividad.
- Cada una de las actividades desarrolladas, en el diplomado, permitio adquirir los conocimientos necesarios para entender y desarrollar los escenarios propuestos para la fase 11, del diplomado.
- Con el desarrollo de esta última fase se evidencia los conocimientos adquiridos por el estudiante, en el transcurso de este periodo académico.

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