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SOLUCIONES INTEGRADAS LAN / WAN) (OPCI - (203092A\_612)**

Evaluación – Prueba de habilidades prácticas CCNA

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## INDICE

INTRODUCCIÓN .....	4
ESCENARIO 1 .....	5
Topología de red.....	5
Configuración del enrutamiento: .....	9
Configuración del enrutamiento .....	17
Tabla de Enrutamiento.....	29
Deshabilitar la propagación del protocolo RIP.....	33
Verificación del protocolo RIP. ....	35
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. ....	35
Configurar encapsulamiento y autenticación PPP.....	39
Configuración de PAT.....	43
Configuración del servicio DHCP. ....	46
ESCENARIO 2.....	54
Configurar el direccionamiento IP acorde con la topología de red para cada uno de los dispositivos que forman parte del escenario. ....	54
Visualizar tablas de enrutamiento y routers conectados por OSPFv2 .....	60
Visualizar lista resumida de interfaces por OSPF en donde se ilustre el costo de cada interface .....	64
Visualizar el OSPF Process ID, Router ID, Address summarizations, Routing Networks, and passive interfaces configuradas en cada router. ....	65

Configurar VLANs, Puertos troncales, puertos de acceso, encapsulamiento, Inter-VLAN Routing y Seguridad en los Switches acorde a la topología de red establecida. ....	67
En el Switch 3 deshabilitar DNS lookup .....	69
Asignar direcciones IP a los Switches acorde a los lineamientos. ....	69
Desactivar todas las interfaces que no sean utilizadas en el esquema de red. ....	70
Implement DHCP and NAT for IPv4.....	71
Configurar R1 como servidor DHCP para las VLANs 30 y 40. ....	71
Reservar las primeras 30 direcciones IP de las VLAN 30 y 40 para configuraciones estáticas.....	72
Configurar NAT en R2 para permitir que los host puedan salir a internet .....	72
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.....	73
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 .....	74
Verificar procesos de comunicación y redireccionamiento de tráfico en los routers mediante el uso de Ping y Traceroute.....	74
CONCLUSIONES .....	79
BIBLIOGRAFIA .....	80

## INTRODUCCIÓN

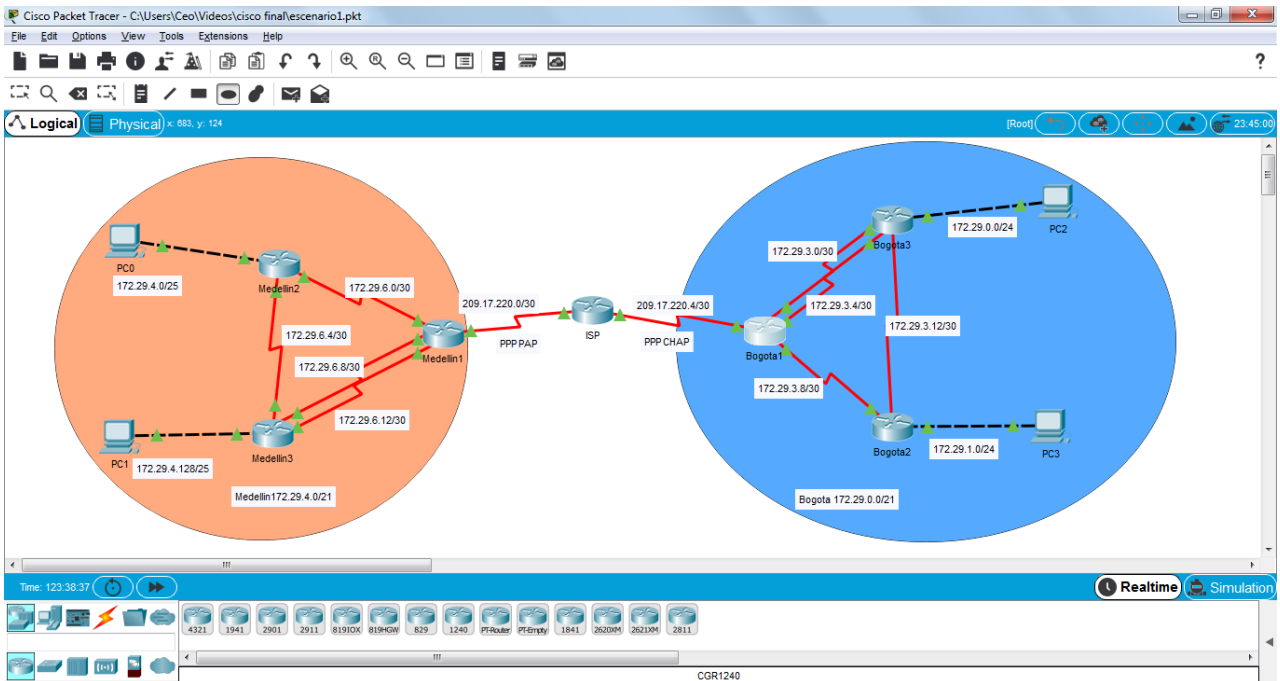
Protocolo de enrutamiento RIP es un protocolo de enrutamiento del tipo vector distancia. Los protocolos de enrutamiento vector distancia calculan la mejor ruta para encaminar los paquetes IP hacia su destino correspondiente, se configurará PPP como método de encapsulamiento y autenticación, la cual permite dos tipos diferentes de autenticación: protocolo de autenticación de contraseña PAP y protocolo de autenticación de intercambio de señales CHAP, Con CHAP, el ID de usuario y la contraseña siempre se envían cifrados, lo que lo convierte en un protocolo más seguro que PAP. Con PAP el ID de usuario y la contraseña nunca se cifran, lo que permite capturarlos si se rastrean.

También se configurará el protocolo OSPF que es un protocolo de enrutamiento sin clase que utiliza el concepto de áreas para realizar la escalabilidad.

## 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.

### Topología de red



### Router ISP

```
Router>en
```

```
Router#conf t
```

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

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

```
Router(config)#service password-encryption
```

```
Router(config)#enable secret class
Router(config)#banner motd "acceso restringido"
Router(config)#ip domain-name unad.cisco
Router(config)#line console 0
Router(config-line)#password cisco
Router(config-line)#login
Router(config-line)#line vty 0 15
Router(config-line)#password cisco
Router(config-line)#login
```

Router Medellin1

```
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#no ip domain-lookup
Router(config)#service password-encryption
Router(config)#enable secret class
Router(config)#banner motd "acceso restringido"
Router(config)#ip domain-name unad.cisco
Router(config)#line console 0
Router(config-line)#password cisco
Router(config-line)#login
Router(config-line)#line vty 0 15
Router(config-line)#password cisco
Router(config-line)#login
```

Router Medellin2

```
Router>en
```

Router#conf t

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

Router(config)#no ip domain-lookup

Router(config)#service password-encryption

Router(config)#enable secret class

Router(config)#banner motd "acceso restringido"

Router(config)#ip domain-name unad.cisco

Router(config)#line console 0

Router(config-line)#password cisco

Router(config-line)#login

Router(config-line)#line vty 0 15

Router(config-line)#password cisco

Router(config-line)#login

Router Medellin3

Router>en

Router#conf t

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

Router(config)#no ip domain-lookup

Router(config)#service password-encryption

Router(config)#enable secret class

Router(config)#banner motd "acceso restringido"

Router(config)#ip domain-name unad.cisco

Router(config)#line console 0

Router(config-line)#password cisco

Router(config-line)#login

Router(config-line)#line vty 0 15

Router(config-line)#password cisco

Router(config-line)#login

Router Bogota1

Router>en

Router#conf t

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

Router(config)#no ip domain-lookup

Router(config)#service password-encryption

Router(config)#enable secret class

Router(config)#banner motd "acceso restringido"

Router(config)#ip domain-name unad.cisco

Router(config)#line console 0

Router(config-line)#password cisco

Router(config-line)#login

Router(config-line)#line vty 0 15

Router(config-line)#password cisco

Router(config-line)#login

Router Bogota2

Router>en

Router#conf t

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

Router(config)#no ip domain-lookup

Router(config)#service password-encryption

Router(config)#enable secret class

Router(config)#banner motd "acceso restringido"

Router(config)#ip domain-name unad.cisco

Router(config)#line console 0

Router(config-line)#password cisco

Router(config-line)#login



```
Router(config-line)#line vty 0 15
Router(config-line)#password cisco
Router(config-line)#login
```

Router Bogota3

```
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#no ip domain-lookup
Router(config)#service password-encryption
Router(config)#enable secret class
Router(config)#banner motd "acceso restringido"
Router(config)#ip domain-name unad.cisco
Router(config)#line console 0
Router(config-line)#password cisco
Router(config-line)#login
Router(config-line)#line vty 0 15
Router(config-line)#password cisco
Router(config-line)#login
```

Configuración del enrutamiento:

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

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.

Router ISP

Router#conf t

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

Router(config)#int s0/0/0

Router(config-if)#ip address 209.17.220.1 255.255.255.252

Router(config-if)#clock rate 4000000

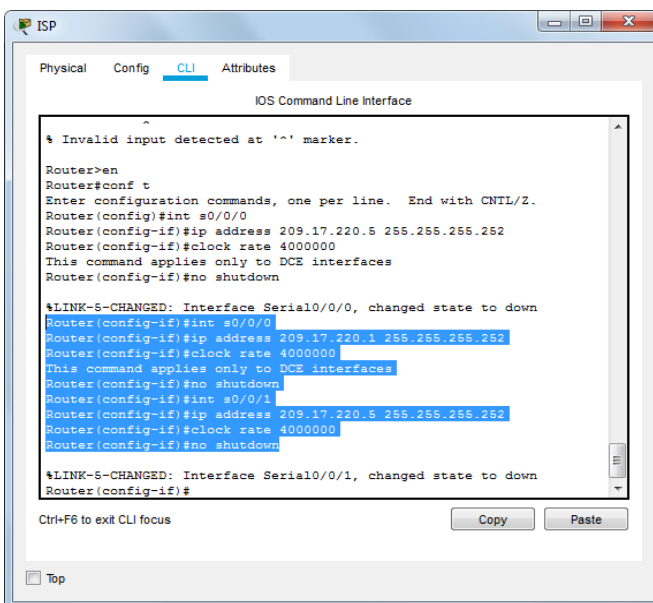
Router(config-if)#no shutdown

Router(config-if)#int s0/0/1

Router(config-if)#ip address 209.17.220.5 255.255.255.252

Router(config-if)#clock rate 4000000

Router(config-if)#no shutdown



```
ISP
Physical Config CLI Attributes
IOS Command Line Interface
* Invalid input detected at '^' marker.
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#int s0/0/0
Router(config-if)#ip address 209.17.220.5 255.255.255.252
Router(config-if)#clock rate 4000000
This command applies only to DCE interfaces
Router(config-if)#no shutdown
*LINK-5-CHANGED: Interface Serial0/0/0, changed state to down
Router(config-if)#int s0/0/0
Router(config-if)#ip address 209.17.220.1 255.255.255.252
Router(config-if)#clock rate 4000000
This command applies only to DCE interfaces
Router(config-if)#no shutdown
Router(config-if)#int s0/0/1
Router(config-if)#ip address 209.17.220.5 255.255.255.252
Router(config-if)#clock rate 4000000
Router(config-if)#no shutdown
*LINK-5-CHANGED: Interface Serial0/0/1, changed state to down
Router(config-if)#
Ctrl+F6 to exit CLI focus
Copy Paste
Top
```

Configuracion del Router ISP con las direcciones ip indicadas

Medellin1

Router>en

Router#conf t

Router(config-if)#int s0/0/1

Router(config-if)#ip address 172.29.6.1 255.255.255.252

Router(config-if)#clock rate 4000000

Router(config-if)#no shutdown

Router(config-if)#int s0/1/0

Router(config-if)#ip address 172.29.6.9 255.255.255.252

Router(config-if)#clock rate 4000000

Router(config-if)#no shutdown

Router(config-if)#int s0/1/1

Router(config-if)#ip address 172.29.6.13 255.255.255.252

Router(config-if)#clock rate 4000000

Router(config-if)#no shutdown

Medellin2

Router>en

Router#conf t

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

Router(config)#int s0/0/0

Router(config-if)#ip add 172.29.6.2 255.255.255.252

Router(config-if)#no shutdown

```
Router(config-if)#int s0/0/1
```

```
Router(config-if)#ip address 172.29.6.5 255.255.255.252
```

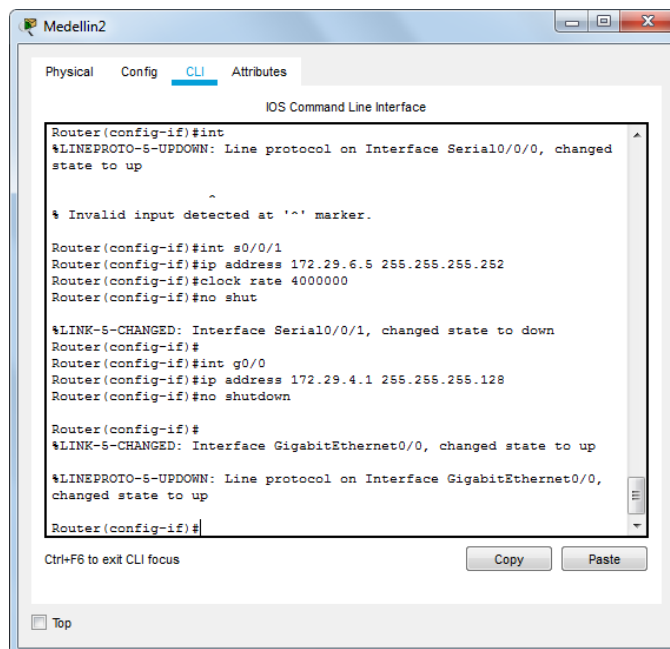
```
Router(config-if)#clock rate 4000000
```

```
Router(config-if)#no shutdown
```

```
Router(config-if)#int g0/0
```

```
Router(config-if)#ip address 172.29.4.1 255.255.255.128
```

```
Router(config-if)#no shutdown
```



```
Medellin2
Physical Config CLI Attributes
IOS Command Line Interface
Router(config-if)#int
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed
state to up
~
% Invalid input detected at '^' marker.
Router(config-if)#int s0/0/1
Router(config-if)#ip address 172.29.6.5 255.255.255.252
Router(config-if)#clock rate 4000000
Router(config-if)#no shut
%LINK-5-CHANGED: Interface Serial0/0/1, changed state to down
Router(config-if)#
Router(config-if)#int g0/0
Router(config-if)#ip address 172.29.4.1 255.255.255.128
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0,
changed state to up
Router(config-if)#
Ctrl+F6 to exit CLI focus
Copy Paste
Top
```

Conexión de router medellin2

Medellin 3

```
Router>en
```

```
Router#conf t
```

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

```
Router(config)#int s0/0/0
```

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

```
Router(config-if)#no shutdown
```

```
Router(config-if)#int s0/0/1
```

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

```
Router(config-if)#no shutdown
```

```
Router(config-if)#int s0/1/0
```

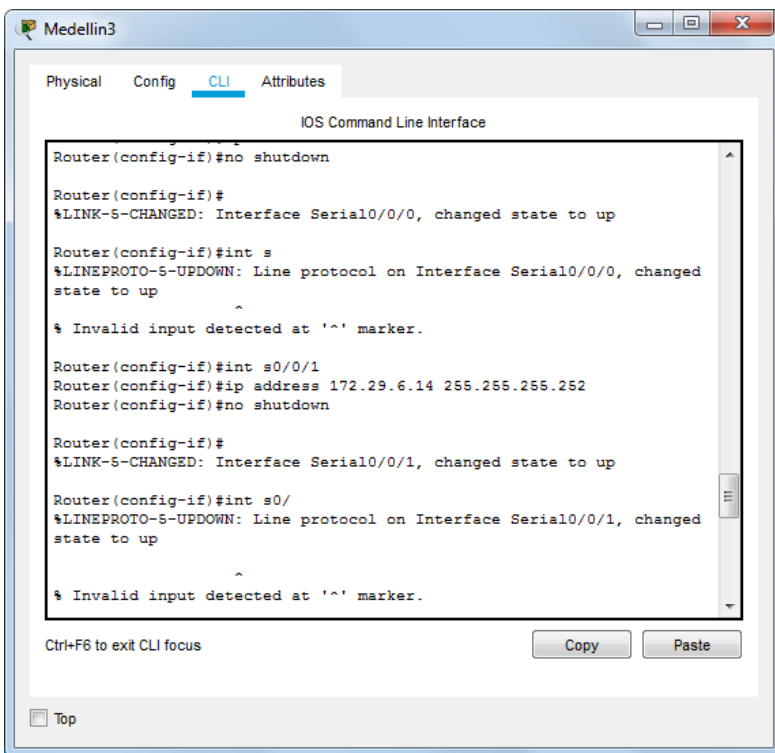
```
Router(config-if)#ip address 172.29.6.6 255.255.255.252
```

```
Router(config-if)#no shutdown
```

```
Router(config-if)#int g0/0
```

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

```
Router(config-if)#no shutdown
```



Conexión de router medellin3

Bogota 1

Router>en

Router#conf t

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

Router(config)#int s0/0/0

Router(config-if)#ip address 209.17.220.6 255.255.255.252

Router(config-if)#no shut

Router(config-if)#int s0/0/1

Router(config-if)#ip address 172.29.3.9 255.255.255.252

Router(config-if)#clock rate 4000000

Router(config-if)#no shut

Router(config-if)#int s0/1/0

Router(config-if)#ip address 172.29.3.1 255.255.255.252

Router(config-if)#clock rate 4000000

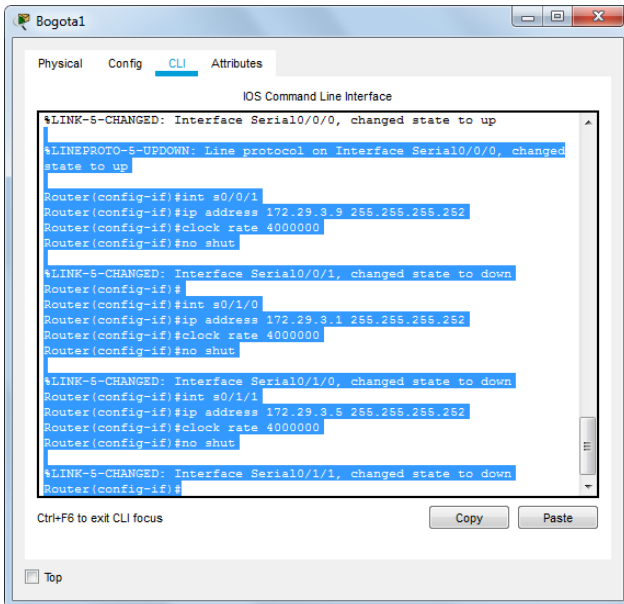
Router(config-if)#no shut

Router(config-if)#int s0/1/1

Router(config-if)#ip address 172.29.3.5 255.255.255.252

Router(config-if)#clock rate 4000000

Router(config-if)#no shut



Conexión de router bogota1

Bogota 2

Router>en

Router#conf t

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

Router(config)#int s0/0/0

Router(config-if)#ip address 172.29.3.10 255.255.255.252

Router(config-if)#no shut

Router(config-if)#int s0/0/1

Router(config-if)#ip add 172.29.3.13 255.255.255.252

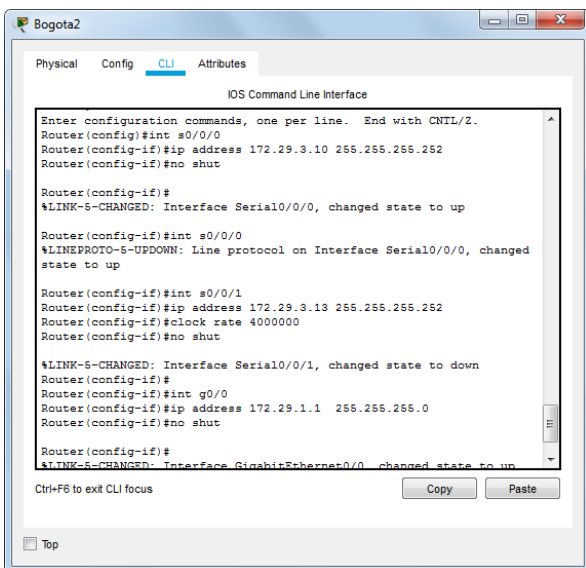
Router(config-if)#clock rate 4000000

Router(config-if)#no shut

Router(config-if)#int g0/0

Router(config-if)#ip address 172.29.1.1 255.255.255.0

Router(config-if)#no shut



## Conexión de router bogota2

### Bogota 3

Router>en

Router#conf t

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

Router(config)#int s0/0/0

Router(config-if)#ip address 172.29.3.2 255.255.255.252

Router(config-if)#no shut

Router(config-if)#int s0/0/1

Router(config-if)#ip address 172.29.3.6 255.255.255.252

Router(config-if)#no shut

Router(config-if)#int g0/0

Router(config-if)#ip address 172.29.0.1 255.255.255.0

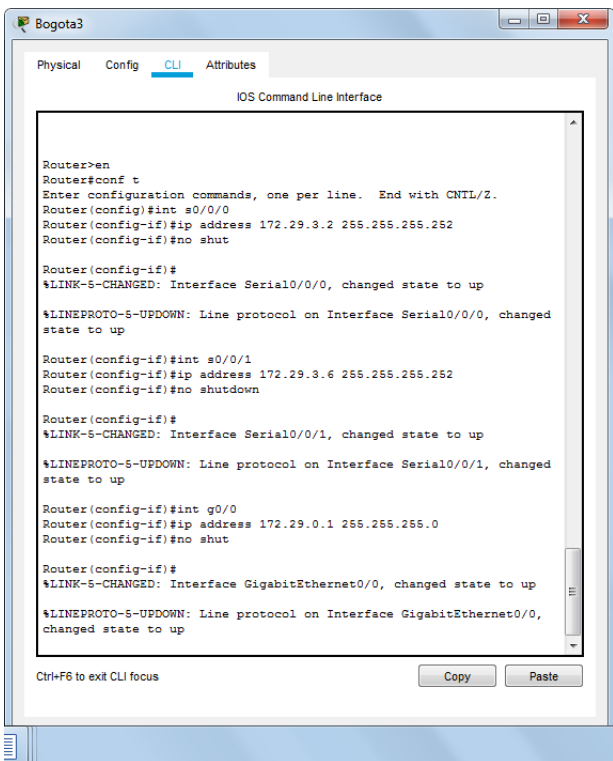


Router(config-if)#no shut

Router(config)#int s0/1/0

Router(config-if)#ip address 172.29.3.14 255.255.255.252

Router(config-if)#no shut



```
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#int s0/0/0
Router(config-if)#ip address 172.29.3.2 255.255.255.252
Router(config-if)#no shut

Router(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed
state to up

Router(config-if)#int s0/0/1
Router(config-if)#ip address 172.29.3.6 255.255.255.252
Router(config-if)#no shutdown

Router(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

Router(config-if)#int g0/0
Router(config-if)#ip address 172.29.0.1 255.255.255.0
Router(config-if)#no shut

Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0,
changed state to up

Ctrl+F6 to exit CLI focus
```

Conexión de router bogota3

Configuración del enrutamiento

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

## **Bogota3**

```
Router(config-router)#version 2
Router(config-router)#no auto-summary
Router(config-router)#do show ip route connected
C 172.29.0.0/24 is directly connected, GigabitEthernet0/0
C 172.29.3.0/30 is directly connected, Serial0/0/0
C 172.29.3.4/30 is directly connected, Serial0/0/1
C 172.29.3.12/30 is directly connected, Serial0/1/0
```

```
Router(config-router)#network 172.29.0.0
Router(config-router)#network 172.29.3.0
Router(config-router)#network 172.29.3.4
Router(config-router)#network 172.29.3.4
Router(config-router)#network 172.29.3.12
Router(config-router)#passive-interface g0/0
```

## **Bogota2**

```
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router rip
Router(config-router)#version 2
Router(config-router)#no auto summary
Router(config-router)#do show ip route connected
C 172.29.1.0/24 is directly connected, GigabitEthernet0/0
C 172.29.3.8/30 is directly connected, Serial0/0/0
C 172.29.3.12/30 is directly connected, Serial0/0/1
```

```
Router(config-router)#network 172.29.1.0
Router(config-router)#network 172.29.3.8
Router(config-router)#network 172.29.3.12
Router(config-router)#passive-interface g0/0
Router(config-router)#
```

## **Medellin1**

```
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router rip
Router(config-router)#version 2
Router(config-router)#no auto-summary
Router(config-router)#do show ip route connected
C 172.29.6.0/30 is directly connected, Serial0/0/1
C 172.29.6.8/30 is directly connected, Serial0/1/0
C 172.29.6.12/30 is directly connected, Serial0/1/1
C 209.17.220.0/30 is directly connected, Serial0/0/0
```

```
Router(config-router)#network 172.29.6.0
Router(config-router)#network 172.29.6.8
Router(config-router)#network 172.29.6.12
Router(config-router)#passive-interface s0/0/0
```

## **Medellin2**

```
Router>en
Router#conf t
```

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

```
Router(config)#router rip
```

```
Router(config-router)#version 2
```

```
Router(config-router)#no auto summary
```

```
Router(config-router)#do show ip route conneted
```

```
Translating "conneted"...domain server (255.255.255.255)
```

```
% Invalid input detected
```

```
Router(config-router)#do show ip route connected
```

```
C 172.29.4.0/25 is directly connected, GigabitEthernet0/0
```

```
C 172.29.6.0/30 is directly connected, Serial0/0/0
```

```
C 172.29.6.4/30 is directly connected, Serial0/0/1
```

```
Router(config-router)#network 172.29.4.0
```

```
Router(config-router)#network 172.29.6.0
```

```
Router(config-router)#network 172.29.6.4
```

```
Router(config-router)#passive-interface g0/0
```

### **Medellin3**

```
Router>en
```

```
Router#conf t
```

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

```
Router(config)#router rip
```

```
Router(config-router)#version 2
```

```
Router(config-router)#no auto-summary
```

```
Router(config-router)#do show ip route connected
```

```
C 172.29.4.128/25 is directly connected, GigabitEthernet0/0
```

```
C 172.29.6.4/30 is directly connected, Serial0/1/0
```

```
C 172.29.6.8/30 is directly connected, Serial0/0/0
```

```
C 172.29.6.12/30 is directly connected, Serial0/0/1
```

```
Router(config-router)#network 172.29.4.128
```

```
Router(config-router)#network 172.29.6.4
```

```
Router(config-router)#network 172.29.6.8
```

```
Router(config-router)#network 172.29.6.12
```

```
Router(config-router)#passive-interface g0/0
```

```
IOS Command Line Interface

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

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

Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router rip
Router(config-router)#version 2
Router(config-router)#no auto-summary
Router(config-router)#do show ip route connected
C 172.29.6.0/30 is directly connected, Serial0/0/1
C 172.29.6.8/30 is directly connected, Serial0/1/0
C 172.29.6.12/30 is directly connected, Serial0/1/1
C 209.17.220.0/30 is directly connected, Serial0/0/0

Router(config-router)#network 172.29.6.0
Router(config-router)#network 172.29.6.8
Router(config-router)#network 172.29.6.12
Router(config-router)#passive-interface s0/0/0
Router(config-router)#
```

## Configuracion Router Rip Medellin1

Medellin2

Physical Config **CLI** Attributes

IOS Command Line Interface

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

Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router rip
Router(config-router)#version 2
Router(config-router)#no auto summary
Router(config-router)#do show ip route conneted
Translating "conneted"...domain server (255.255.255.255)
% Invalid input detected

Router(config-router)#do show ip route connected
C 172.29.4.0/25 is directly connected, GigabitEthernet0/0
C 172.29.6.0/30 is directly connected, Serial0/0/0
C 172.29.6.4/30 is directly connected, Serial0/0/1

Router(config-router)#network 172.29.4.0
Router(config-router)#network 172.29.6.0
Router(config-router)#network 172.29.6.4
Router(config-router)#passive-interface g0/0
Router(config-router)#
```

Ctrl+F6 to exit CLI focus

Copy Paste

Top

### Configuracion Router Rip Medellin2

Medellin3

Physical Config **CLI** Attributes

IOS Command Line Interface

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

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

Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router rip
Router(config-router)#version 2
Router(config-router)#no auto-summary
Router(config-router)#do show ip route connected
C 172.29.4.128/25 is directly connected, GigabitEthernet0/0
C 172.29.6.4/30 is directly connected, Serial0/1/0
C 172.29.6.8/30 is directly connected, Serial0/0/0
C 172.29.6.12/30 is directly connected, Serial0/0/1

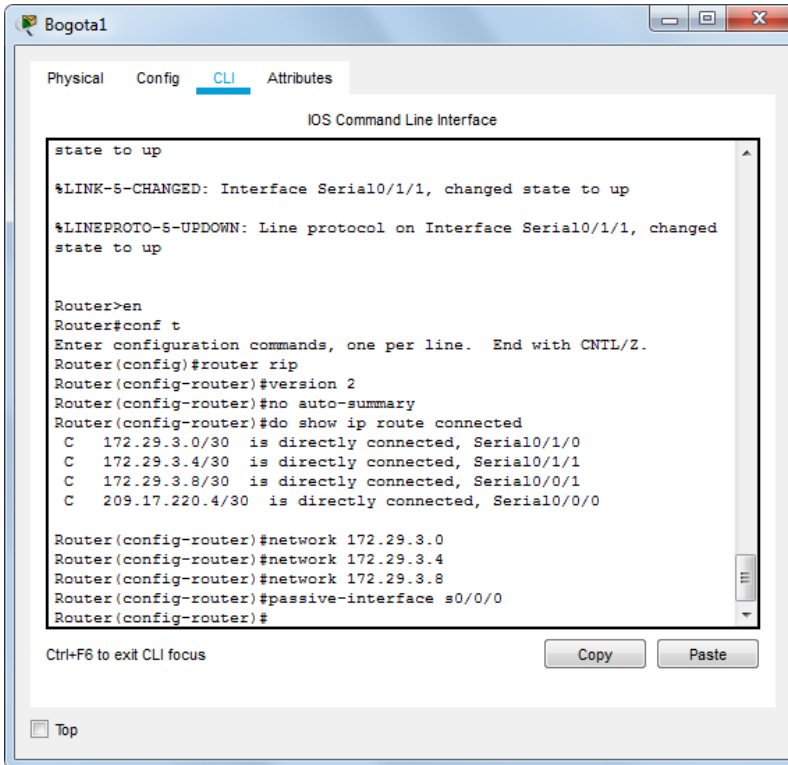
Router(config-router)#network 172.29.4.128
Router(config-router)#network 172.29.6.4
Router(config-router)#network 172.29.6.8
Router(config-router)#network 172.29.6.12
Router(config-router)#passive-interface g0/0
Router(config-router)#
```

Ctrl+F6 to exit CLI focus

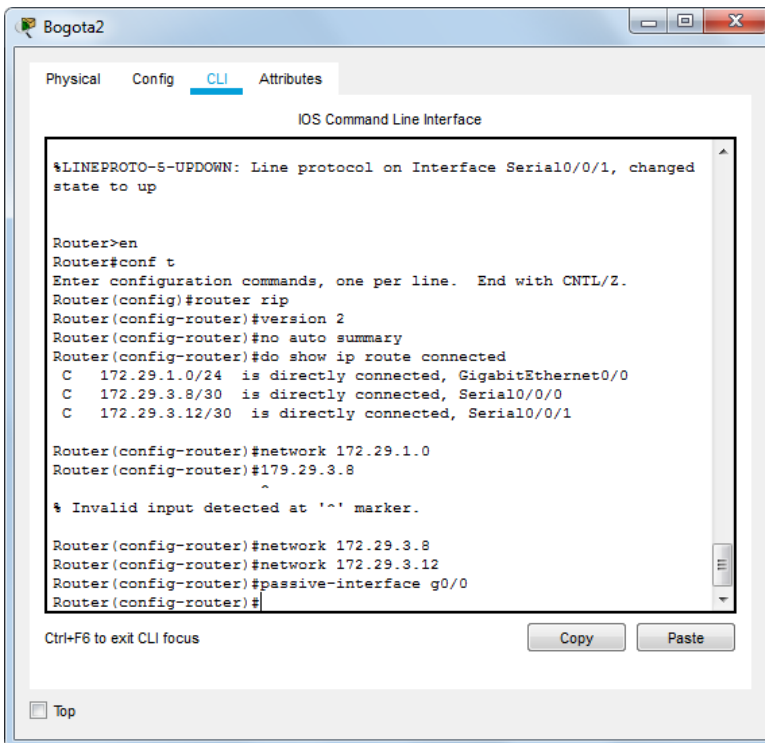
Copy Paste

Top

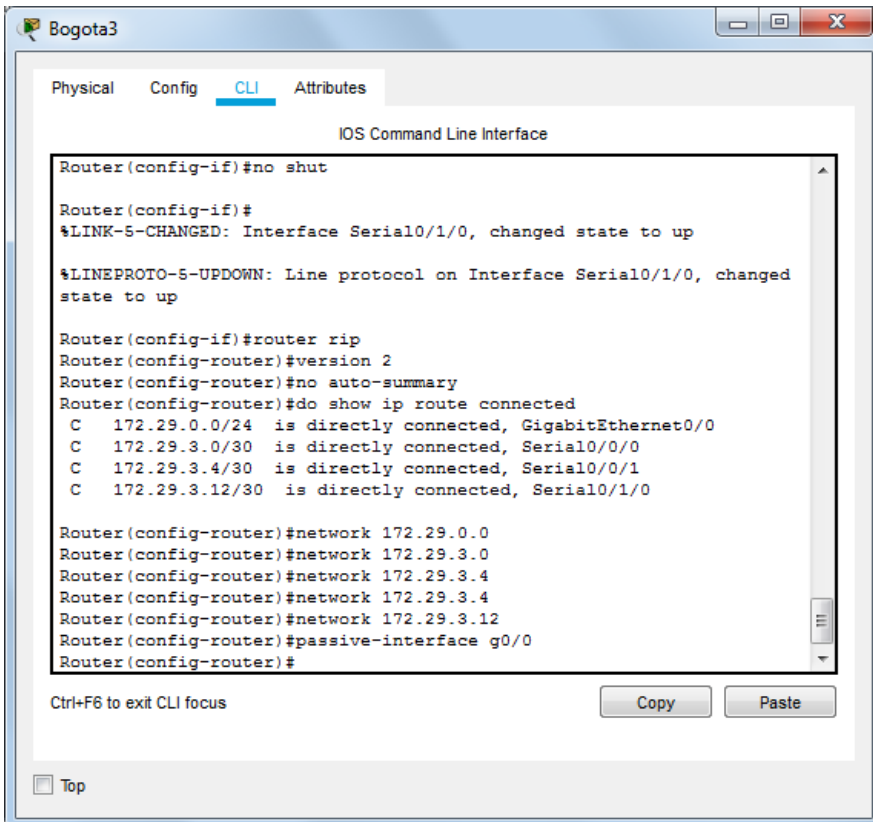
### Configuracion Router Rip Medellin3



## Configuracion Router Rip Bogota1



## Configuracion Router Rip Bogota2



## Configuracion Router Rip Bogota3

Verificar que todas las direcciones estén directamente conectadas con los puertos establecidos en cada router procedemos en bogota1 a verificar

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 172.29.3.2, 00:00:16, Serial0/1/0

[120/1] via 172.29.3.6, 00:00:16, Serial0/1/1

R 172.29.1.0/24 [120/1] via 172.29.3.10, 00:00:02, Serial0/0/1

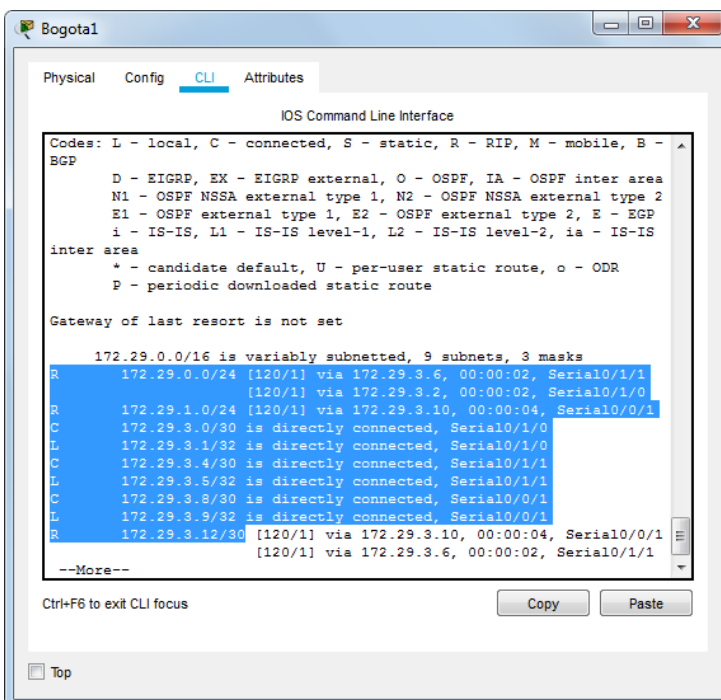
C 172.29.3.0/30 is directly connected, Serial0/1/0

L 172.29.3.1/32 is directly connected, Serial0/1/0

C 172.29.3.4/30 is directly connected, Serial0/1/1



L 172.29.3.5/32 is directly connected, Serial0/1/1  
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 172.29.3.10, 00:00:02, Serial0/0/1  
[120/1] via 172.29.3.2, 00:00:16, Serial0/1/0  
[120/1] via 172.29.3.6, 00:00:16, Serial0/1/1



Show ip route

d. 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.

Router>en

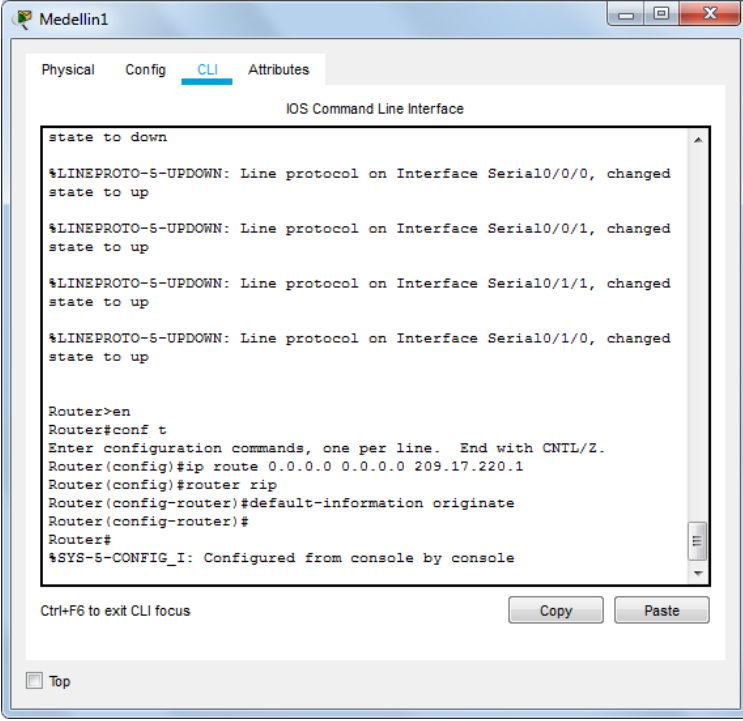
Router#conf t

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

Router(config)#ip route 0.0.0.0 0.0.0.0 209.17.220.1

Router(config)#router rip

## Router(config-router)#default-information originate



```
state to down

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

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

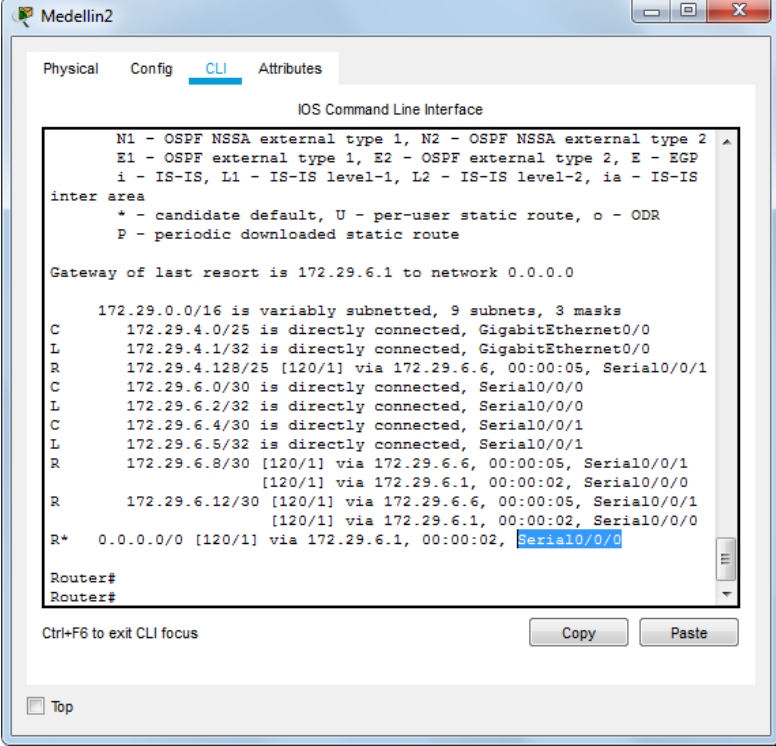
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1/1, changed
state to up

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

Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ip route 0.0.0.0 0.0.0.0 209.17.220.1
Router(config)#router rip
Router(config-router)#default-information originate
Router(config-router)#
Router#
%SYS-5-CONFIG_I: Configured from console by console

Ctrl+F6 to exit CLI focus
```

## Medellin1



```
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 172.29.6.1 to network 0.0.0.0

172.29.0.0/16 is variably subnetted, 9 subnets, 3 masks
C 172.29.4.0/25 is directly connected, GigabitEthernet0/0
L 172.29.4.1/32 is directly connected, GigabitEthernet0/0
R 172.29.4.128/25 [120/1] via 172.29.6.6, 00:00:05, Serial0/0/1
C 172.29.6.0/30 is directly connected, Serial0/0/0
L 172.29.6.2/32 is directly connected, Serial0/0/0
C 172.29.6.4/30 is directly connected, Serial0/0/1
L 172.29.6.5/32 is directly connected, Serial0/0/1
R 172.29.6.8/30 [120/1] via 172.29.6.6, 00:00:05, Serial0/0/1
[120/1] via 172.29.6.1, 00:00:02, Serial0/0/0
R 172.29.6.12/30 [120/1] via 172.29.6.6, 00:00:05, Serial0/0/1
[120/1] via 172.29.6.1, 00:00:02, Serial0/0/0
R* 0.0.0.0/0 [120/1] via 172.29.6.1, 00:00:02, Serial0/0/0

Router#
Router#

Ctrl+F6 to exit CLI focus
```

Medellin 2 sabe que puede llegar a internet por su serial 0/0/0

Router>en

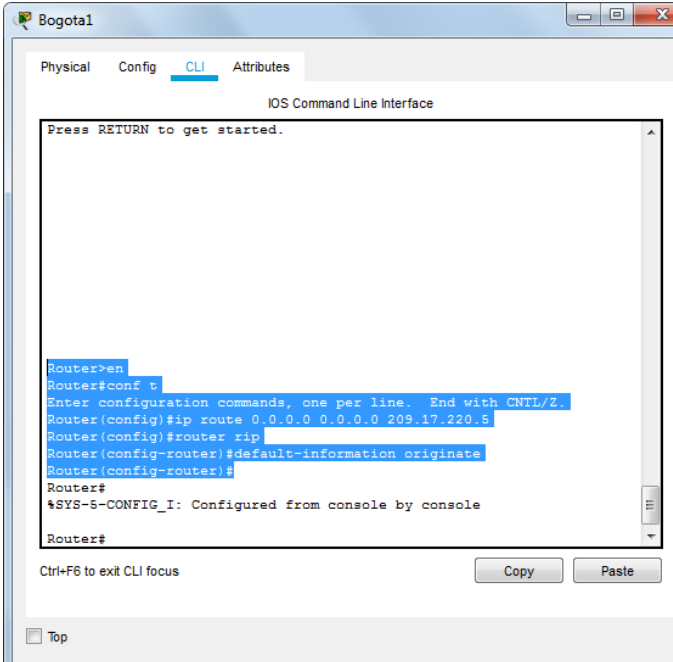
Router#conf t

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

Router(config)#ip route 0.0.0.0 0.0.0.0 209.17.220.5

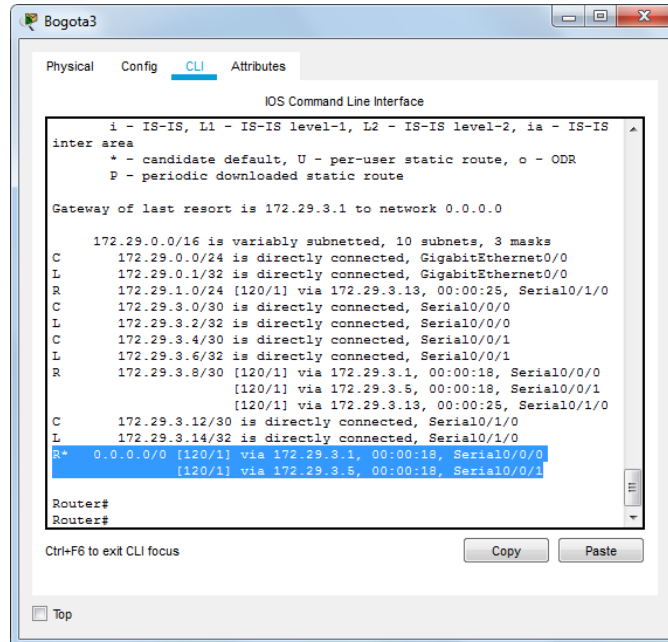
Router(config)#router rip

Router(config-router)#default-information originate



```
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ip route 0.0.0.0 0.0.0.0 209.17.220.5
Router(config)#router rip
Router(config-router)#default-information originate
Router(config-router)#
Router#
%SYS-5-CONFIG_I: Configured from console by console
Router#
```

Bogota1



Tiene dos formas de llegar por la serial 0/0/0 y serial 0/0/1

e. 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.

### Medellin

172	29	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	172.29.4.0/25
172	29	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	172.29.4.128/25
172	29	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	0	0	172.29.6.4/30
172	29	0	0	0	0	0	0	1	1	0	0	0	0	0	1	0	0	0	172.29.6.8/30
172	29	0	0	0	0	0	0	1	1	0	0	0	0	0	1	1	0	0	172.29.6.12/30
172	29	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	172.29.6.0/30
172	29	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	<b>172.29.4.0/21</b>

### Bogota

172	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	172.29.0.0/24
172	29	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	172.29.1.0/24
172	29	0	0	0	0	0	0	0	1	1	0	0	0	0	1	1	0	0	172.29.3.12/30
172	29	0	0	0	0	0	0	0	1	1	0	0	0	0	1	0	0	0	172.29.3.8/30
172	29	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	172.29.3.0/30
172	29	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1	0	0	172.29.3.4/30
172	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	<b>172.29.0.0/21</b>

Crear rutas estaticas.

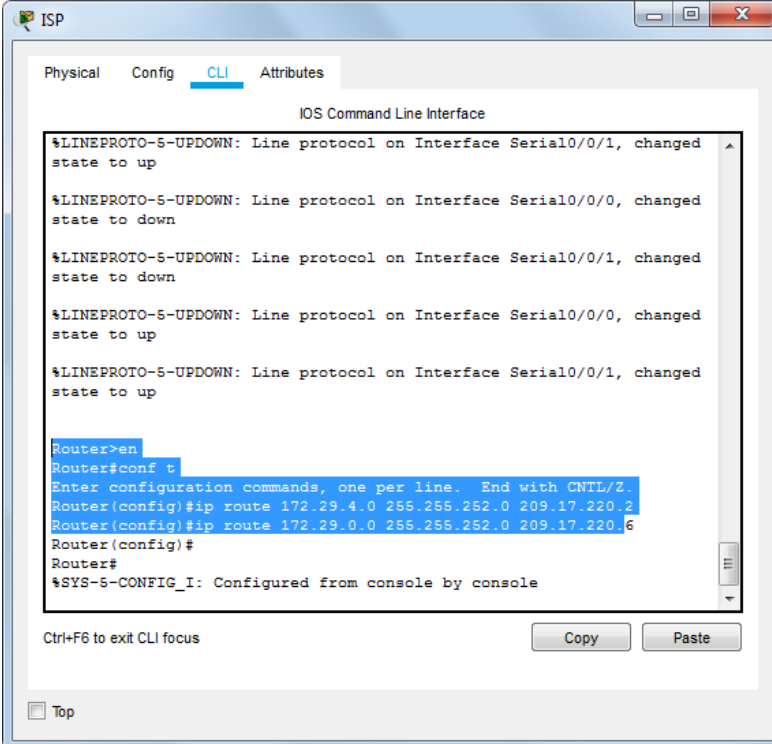
Router>en

Router#conf t

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

Router(config)#ip route 172.29.4.0 255.255.252.0 209.17.220.2

Router(config)#ip route 172.29.0.0 255.255.252.0 209.17.220.



The screenshot shows a window titled "ISP" with a tab labeled "CLI". The window displays the "IOS Command Line Interface" with the following text:

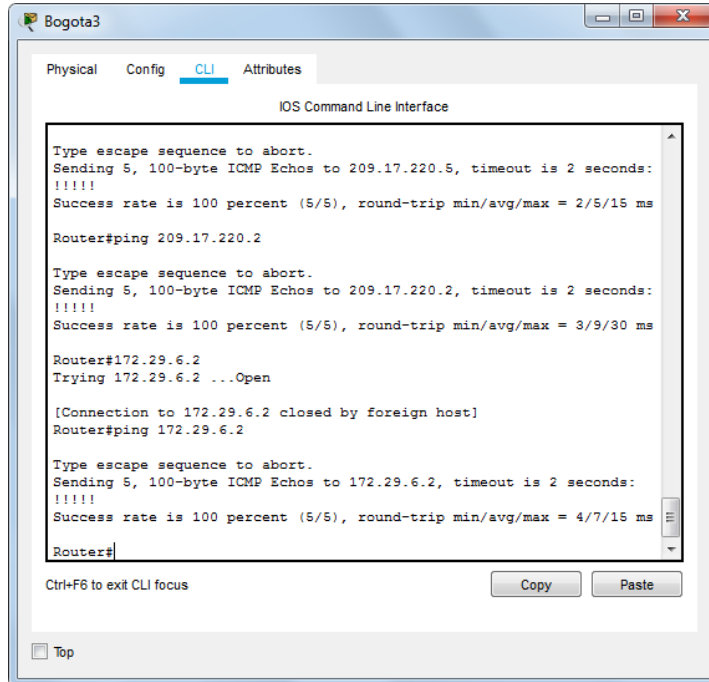
```
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ip route 172.29.4.0 255.255.252.0 209.17.220.2
Router(config)#ip route 172.29.0.0 255.255.252.0 209.17.220.6
Router(config)#
Router#
%SYS-5-CONFIG_I: Configured from console by console
```

At the bottom of the window, there are buttons for "Copy" and "Paste", and a "Top" button.

ISP

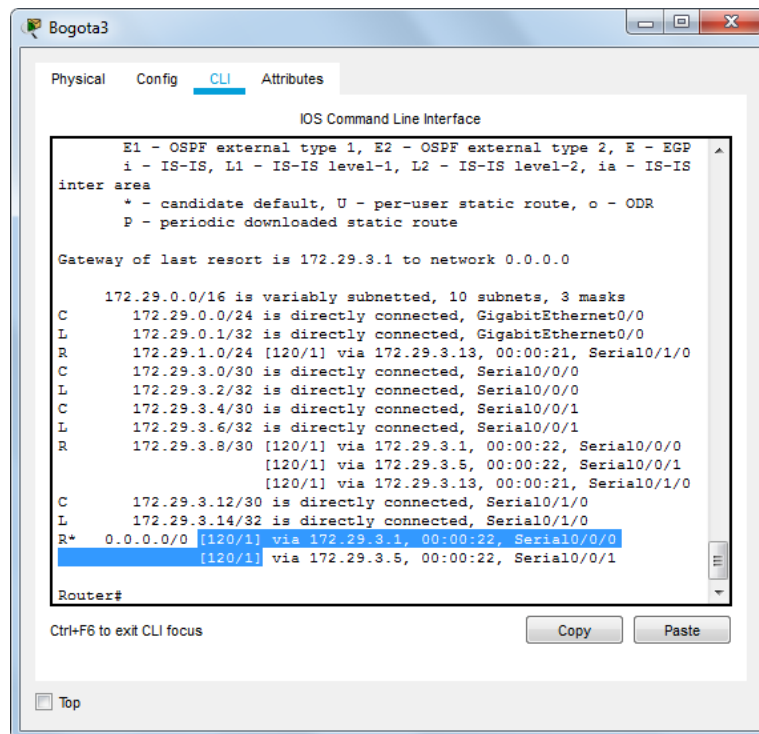
Tabla de Enrutamiento.

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



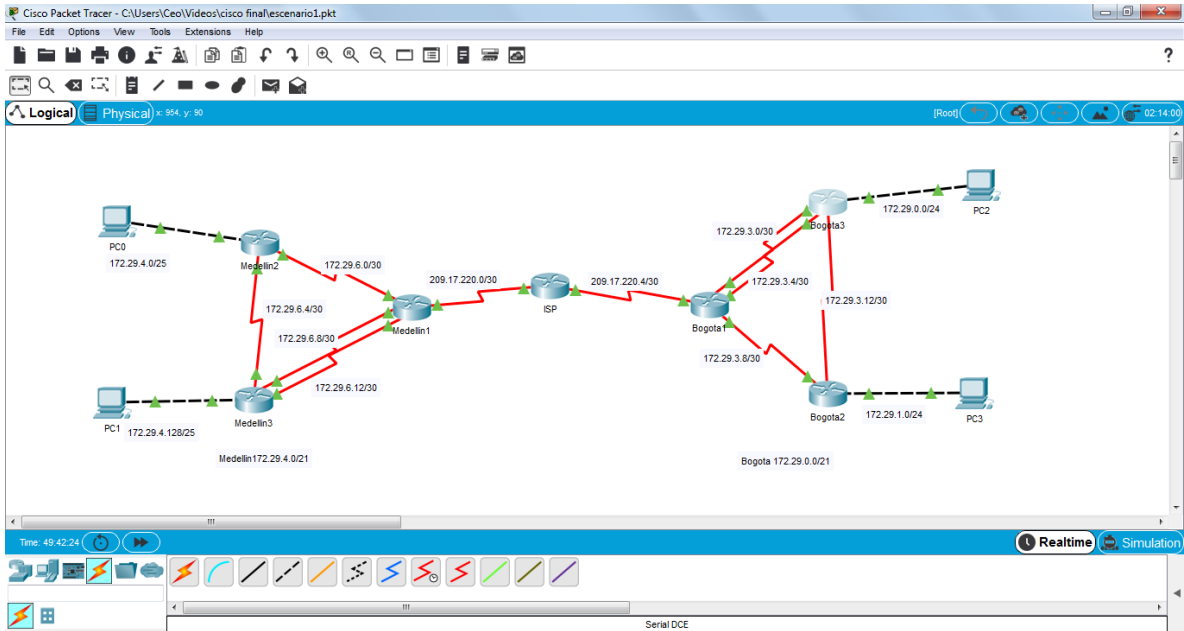
Hay Conectividad de extremo a extremos haciendo ping a cada ip

b. Verificar el balanceo de carga que presentan los routers.



Hay 2 interfaces de carga como tambien en la 172.29.3.8 hay tres caminos donde se balancea la carga

c. Obsérvese en los routers Bogotá1 y Medellín1 cierta similitud por su ubicación, por tener dos enlaces de conexión hacia otro router y por la ruta por defecto que manejan.



Son dos redes muy parecidas bogota1 y medellin1

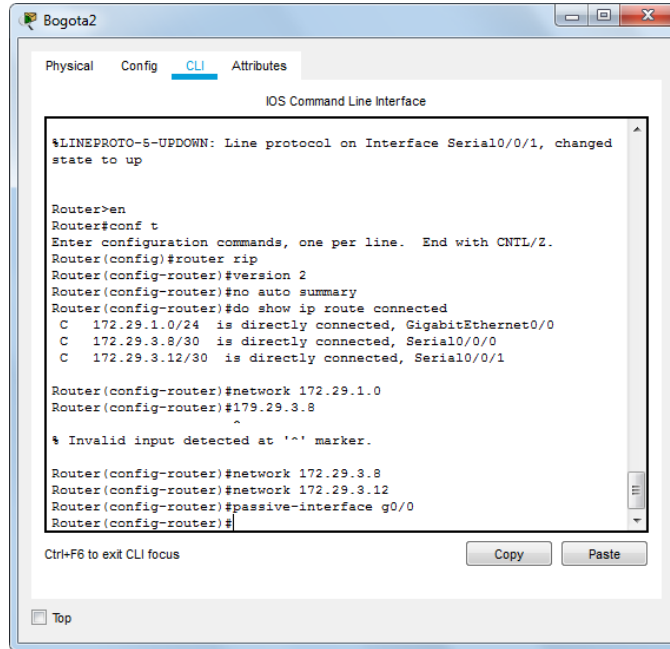
d. Los routers Medellín2 y Bogotá2 también presentan redes conectadas directamente y recibidas mediante RIP.

```
Medellin2
Physical Config CLI Attributes
IOS Command Line Interface
$LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/1, changed
state to up
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router rip
Router(config-router)#version 2
Router(config-router)#no auto summary
Router(config-router)#do show ip route conncted
Translating "conncted"...domain server (255.255.255.255)
% Invalid input detected

Router(config-router)#do show ip route connected
C 172.29.4.0/25 is directly connected, GigabitEthernet0/0
C 172.29.6.0/30 is directly connected, Serial0/0/0
C 172.29.6.4/30 is directly connected, Serial0/0/1

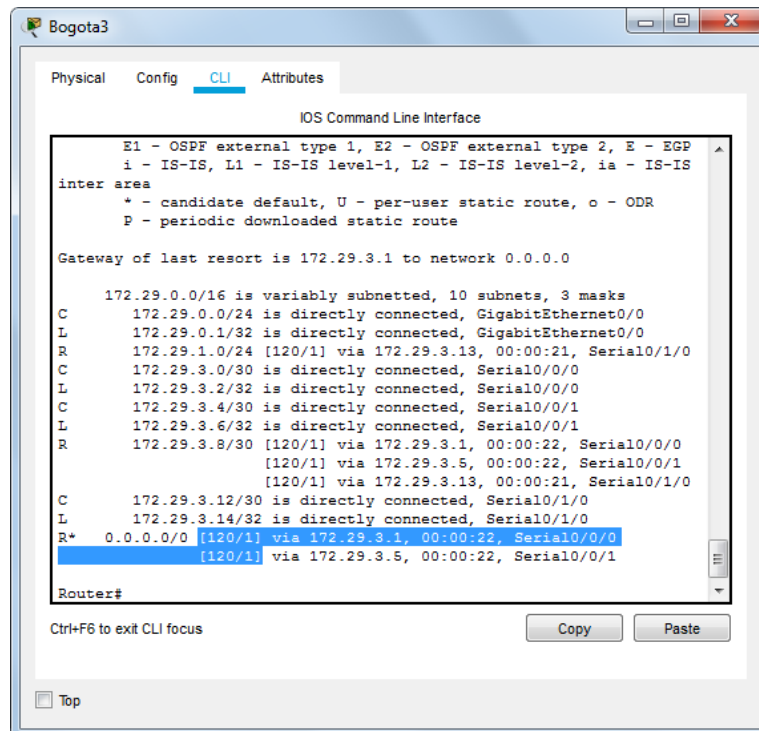
Router(config-router)#network 172.29.4.0
Router(config-router)#network 172.29.6.0
Router(config-router)#network 172.29.6.4
Router(config-router)#passive-interface g0/0
Router(config-router)#
```

Medellin2



Bogota2

e. Las tablas de los routers restantes deben permitir visualizar rutas redundantes para el caso de la ruta por defecto.



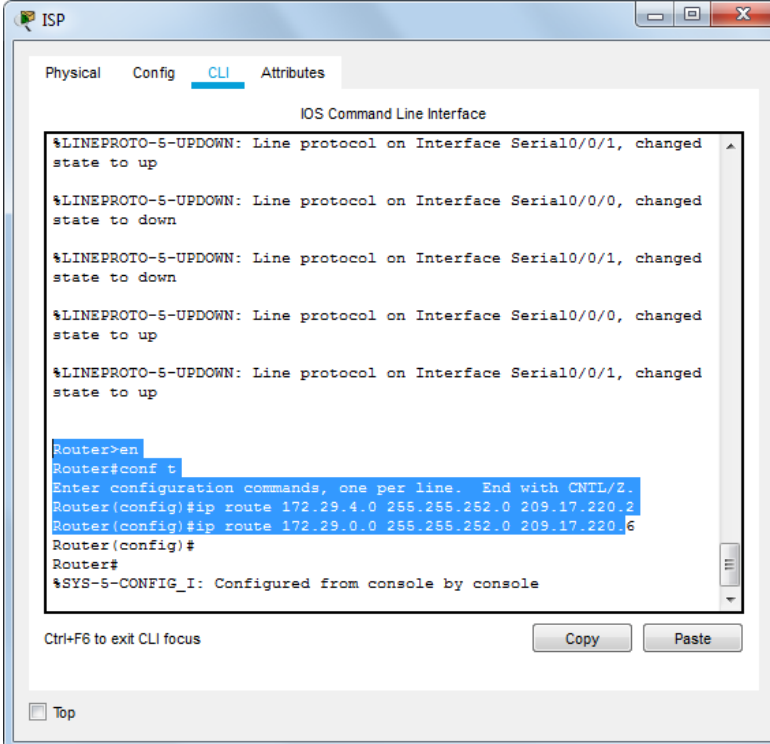
El balanceo de carga son rutas redundante



f. El router ISP solo debe indicar sus rutas estáticas adicionales a las directamente conectadas.

```
Router(config)#ip route 172.29.4.0 255.255.252.0 209.17.220.2
```

```
Router(config)#ip route 172.29.0.0 255.255.252.0 209.17.220.
```



The screenshot shows the IOS Command Line Interface (CLI) for a router. The window title is "ISP". The tabs are "Physical", "Config", "CLI", and "Attributes". The main content area displays the following text:

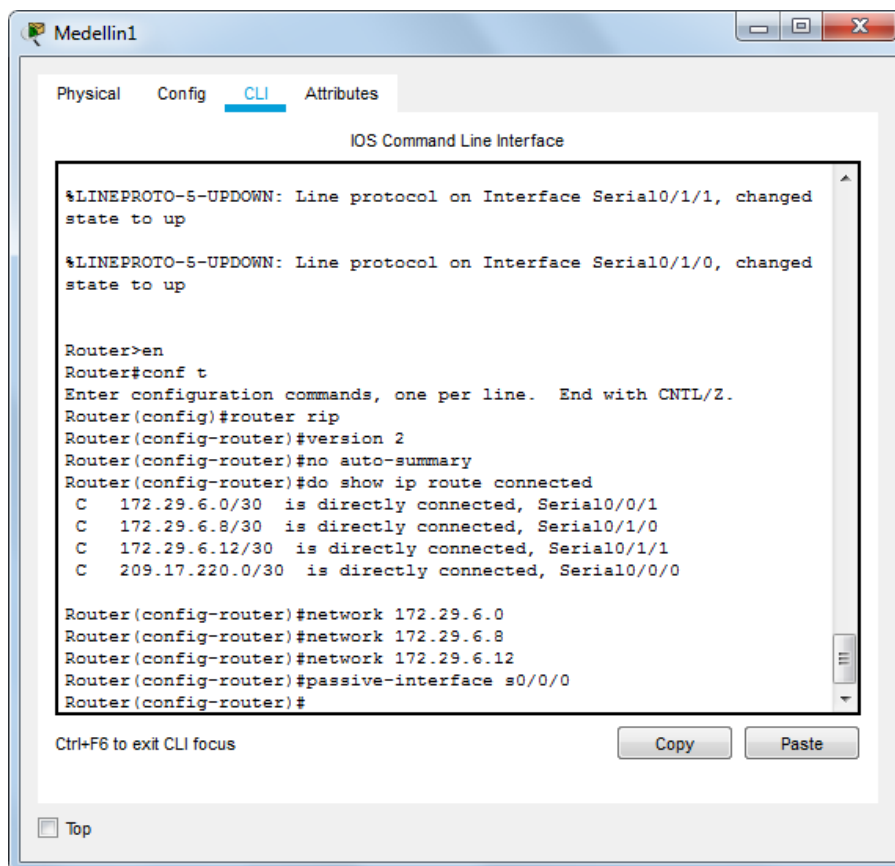
```
IOS Command Line Interface
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/1, changed
state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed
state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/1, changed
state to down
%LINEPROTO-5-UPDOWN: Line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

Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ip route 172.29.4.0 255.255.252.0 209.17.220.2
Router(config)#ip route 172.29.0.0 255.255.252.0 209.17.220.2
Router(config)#
Router#
%SYS-5-CONFIG_I: Configured from console by console
```

At the bottom of the window, there are buttons for "Copy" and "Paste", and a "Top" button.

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.



Este procedimiento ya esta configurado anteriormente cuando estábamos configurando rip para bogota1, medellin1.

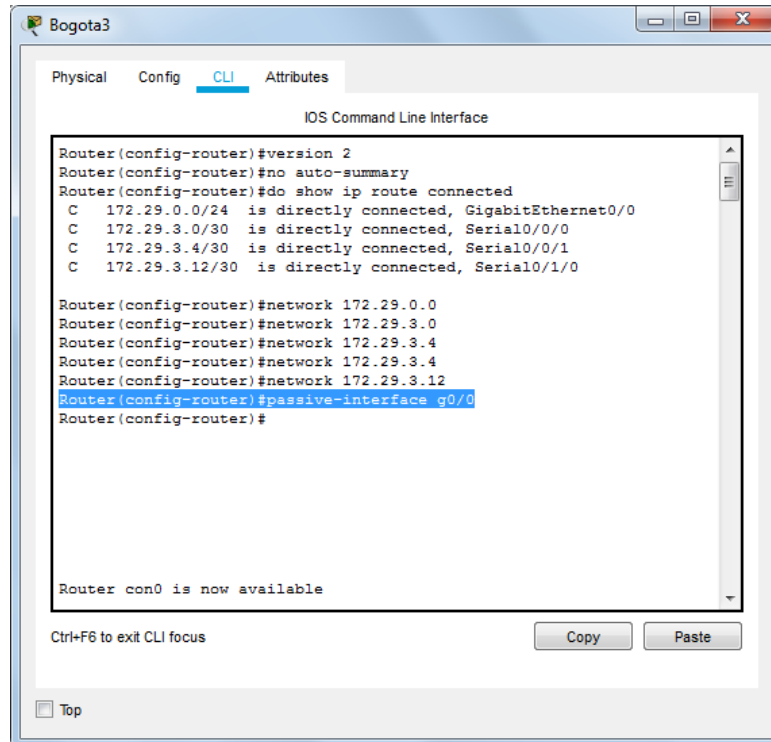
ROUTER	INTERFAZ
<b>Bogota1</b>	SERIAL0/0/1; SERIAL0/1/0; SERIAL0/1/1
<b>Bogota2</b>	SERIAL0/0/0; SERIAL0/0/1
<b>Bogota3</b>	SERIAL0/0/0; SERIAL0/0/1; SERIAL0/1/0
<b>Medellín1</b>	SERIAL0/0/0; SERIAL0/0/1; SERIAL0/1/1
<b>Medellín2</b>	SERIAL0/0/0; SERIAL0/0/1
<b>Medellín3</b>	SERIAL0/0/0; SERIAL0/0/1; SERIAL0/1/0
<b>ISP</b>	No lo requiere

Verificación del protocolo RIP.

a. 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.

```
Router(config-router)#version 2
Router(config-router)#no auto-summary
Router(config-router)#do show ip route connected
C 172.29.0.0/24 is directly connected, GigabitEthernet0/0
C 172.29.3.0/30 is directly connected, Serial0/0/0
C 172.29.3.4/30 is directly connected, Serial0/0/1
C 172.29.3.12/30 is directly connected, Serial0/1/0
```

```
Router(config-router)#network 172.29.0.0
Router(config-router)#network 172.29.3.0
Router(config-router)#network 172.29.3.4
Router(config-router)#network 172.29.3.4
Router(config-router)#network 172.29.3.12
Router(config-router)#passive-interface g0/0
```



Se Hicieron las interfaces pasivas, la conexión a RIP

b. 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.

### **Bogota3**

```
Router(config-router)#version 2
```

```
Router(config-router)#no auto-summary
```

```
Router(config-router)#do show ip route connected
```

```
C 172.29.0.0/24 is directly connected, GigabitEthernet0/0
```

```
C 172.29.3.0/30 is directly connected, Serial0/0/0
```

```
C 172.29.3.4/30 is directly connected, Serial0/0/1
```

```
C 172.29.3.12/30 is directly connected, Serial0/1/0
```

```
Router(config-router)#network 172.29.0.0
```

```
Router(config-router)#network 172.29.3.0
Router(config-router)#network 172.29.3.4
Router(config-router)#network 172.29.3.4
Router(config-router)#network 172.29.3.12
Router(config-router)#passive-interface g0/0
```

## **Bogota2**

```
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router rip
Router(config-router)#version 2
Router(config-router)#no auto summary
Router(config-router)#do show ip route connected
C 172.29.1.0/24 is directly connected, GigabitEthernet0/0
C 172.29.3.8/30 is directly connected, Serial0/0/0
C 172.29.3.12/30 is directly connected, Serial0/0/1
```

```
Router(config-router)#network 172.29.1.0
Router(config-router)#network 172.29.3.8
Router(config-router)#network 172.29.3.12
Router(config-router)#passive-interface g0/0
Router(config-router)#
```

## **Medellin1**

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

```
Router(config-router)#version 2
Router(config-router)#no auto-summary
Router(config-router)#do show ip route connected
C 172.29.6.0/30 is directly connected, Serial0/0/1
C 172.29.6.8/30 is directly connected, Serial0/1/0
C 172.29.6.12/30 is directly connected, Serial0/1/1
C 209.17.220.0/30 is directly connected, Serial0/0/0
```

```
Router(config-router)#network 172.29.6.0
Router(config-router)#network 172.29.6.8
Router(config-router)#network 172.29.6.12
Router(config-router)#passive-interface s0/0/0
```

## **Medellin2**

```
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router rip
Router(config-router)#version 2
Router(config-router)#no auto summary
Router(config-router)#do show ip route conneted
Translating "conneted"...domain server (255.255.255.255)
% Invalid input detected
```

```
Router(config-router)#do show ip route connected
C 172.29.4.0/25 is directly connected, GigabitEthernet0/0
C 172.29.6.0/30 is directly connected, Serial0/0/0
C 172.29.6.4/30 is directly connected, Serial0/0/1
```

```
Router(config-router)#network 172.29.4.0
Router(config-router)#network 172.29.6.0
Router(config-router)#network 172.29.6.4
Router(config-router)#passive-interface g0/0
```

### **Medellin3**

```
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router rip
Router(config-router)#version 2
Router(config-router)#no auto-summary
Router(config-router)#do show ip route connected
C 172.29.4.128/25 is directly connected, GigabitEthernet0/0
C 172.29.6.4/30 is directly connected, Serial0/1/0
C 172.29.6.8/30 is directly connected, Serial0/0/0
C 172.29.6.12/30 is directly connected, Serial0/0/1
```

```
Router(config-router)#network 172.29.4.128
Router(config-router)#network 172.29.6.4
Router(config-router)#network 172.29.6.8
Router(config-router)#network 172.29.6.12
Router(config-router)#passive-interface g0/0
```

Configurar encapsulamiento y autenticación PPP.

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

Router>en

Router#conf t

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

Router(config)#hostname ISP

ISP(config)#username MEDELLIN password cisco

ISP(config)#int s0/0/0

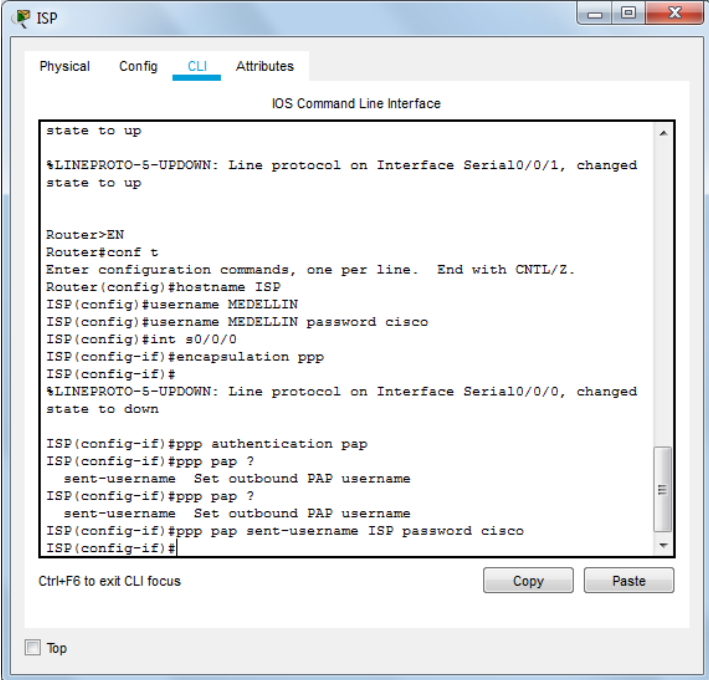
ISP(config-if)#encapsulation PPP

ISP(config-if)# ppp authentication pap

ISP(config-if)# ppp pap ?

    Sent-username Set outbound PAP username

ISP(config-if)# ppp pap sent-username ISP password cisco



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

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

Router>EN
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname ISP
ISP(config)#username MEDELLIN
ISP(config)#username MEDELLIN password cisco
ISP(config)#int s0/0/0
ISP(config-if)#encapsulation ppp
ISP(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed
state to down

ISP(config-if)#ppp authentication pap
ISP(config-if)#ppp pap ?
    sent-username Set outbound PAP username
ISP(config-if)#ppp pap ?
    sent-username Set outbound PAP username
ISP(config-if)#ppp pap sent-username ISP password cisco
ISP(config-if)#
```

Se configuro ISP con autenticación PAP

Router>en

Router#conf t

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

Router(config)#hostname ISP



```
MEDELLIN(config)#username ISP password cisco
```

```
MEDELLIN (config)#int s0/0/0
```

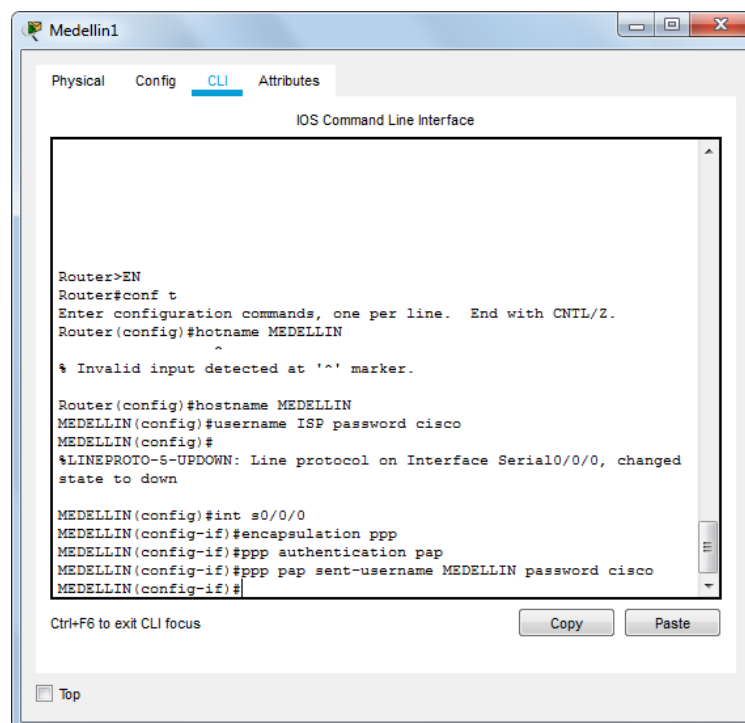
```
MEDELLIN (config-if)#encapsulation PPP
```

```
MEDELLIN (config-if)# ppp authentication pap
```

```
MEDELLIN (config-if)# ppp pap ?
```

Sent-username Set outbound PAP username

```
ISP(config-if)# ppp pap sent-username MEDELLIN password cisco
```



```
Router>EN
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname MEDELLIN
^
% Invalid input detected at '^' marker.

Router(config)#hostname MEDELLIN
MEDELLIN(config)#username ISP password cisco
MEDELLIN(config)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed
state to down

MEDELLIN(config)#int s0/0/0
MEDELLIN(config-if)#encapsulation ppp
MEDELLIN(config-if)#ppp authentication pap
MEDELLIN(config-if)#ppp pap sent-username MEDELLIN password cisco
MEDELLIN(config-if)#
```

Se configuro Medellin1 con autenticación PAP

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

```
Router>en
```

```
Router#conf t
```

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

```
Router(config)#hostname BOGOTA
```

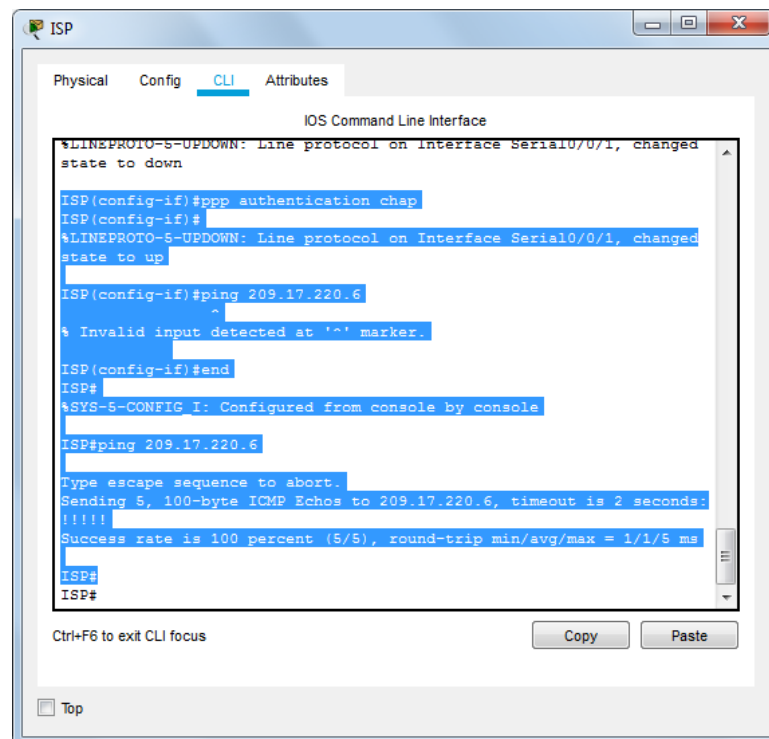
BOGOTA(config)#username BOGOTA password cisco

BOGOTA(config)#username ISP password cisco

BOGOTA(config)#int s0/0/0

BOGOTA(config-if)#encapsulation PPP

BOGOTA(config-if)# ppp authentication chap



```
ISP
Physical Config CLI Attributes
IOS Command Line Interface
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/1, changed
state to down
ISP(config-if)#ppp authentication chap
ISP(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/1, changed
state to up
ISP(config-if)#ping 209.17.220.6
Type escape sequence to abort.
% Invalid input detected at '^' marker.
ISP(config-if)#end
ISP#
%SYS-5-CONFIG I: Configured from console by console
ISP#ping 209.17.220.6
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 209.17.220.6, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/5 ms
ISP#
ISP#
```

Se configuro ISP con autenticación CHAP

```
Router>EN
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname BOGOTA
BOGOTA(config)#username BOGOTA password cisco
BOGOTA(config)#username ISP password cisco
BOGOTA(config)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed
state to down
BOGOTA(config)#int s0/0/0
BOGOTA(config-if)#encapsulation ppp
BOGOTA(config-if)#ppp authentication chap
BOGOTA(config-if)#
^
% Invalid input detected at '^' marker.
BOGOTA(config-if)#ppp authentication chap
BOGOTA(config-if)#
```

Se configuro Bogota1 con autenticación CHAP

### 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.

Se perdería la comunicación de extremo a extremo ejemplo pc2 a pc0

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, cómo diferente puerto.

MEDELLIN>en

MEDELLIN#conf t

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

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

MEDELLIN(config)#access-list 1 permit 172.29.4.0 0.0.3.255

MEDELLIN(config)#int s/0/0/0

MEDELLIN(config-if)#ip nat outside

MEDELLIN(config-if)#int s0/0/1

MEDELLIN(config-if)#ip nat inside

MEDELLIN(config-if)#int s0/1/0

MEDELLIN(config-if)#ip nat inside

MEDELLIN(config-if)#int s0/1/1

MEDELLIN(config-if)#ip nat inside

```
state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/1, changed
state to up
MEDELLIN>en
MEDELLIN#conf t
Enter configuration commands, one per line. End with CNTL/Z.
MEDELLIN(config)#ip nat inside source list 1 interface s0/0/0
overload
MEDELLIN(config)#access-list 1 permit 172.29.4.0 0.0.3.255
MEDELLIN(config)#int s/0/0/0
% Invalid input detected at '^' marker.
MEDELLIN(config)#int s0/0/0
MEDELLIN(config-if)#ip nat outside
MEDELLIN(config-if)#int s0/0/1
MEDELLIN(config-if)#ip nat inside
MEDELLIN(config-if)#int s0/1/0
MEDELLIN(config-if)#ip nat inside
MEDELLIN(config-if)#int s0/1/1
MEDELLIN(config-if)#ip nat inside
MEDELLIN(config-if)#
```

Medellin1

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, cómo diferente puerto.

```
BOGOTA#conf t
```

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

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

```
BOGOTA(config)#access-list 1 permit 172.29.0.0 0.0.3.255
```

```
BOGOTA(config)#int s0/0/0
```

```
BOGOTA(config-if)#ip nat outside
```

```
BOGOTA(config-if)#int s0/0/1
```

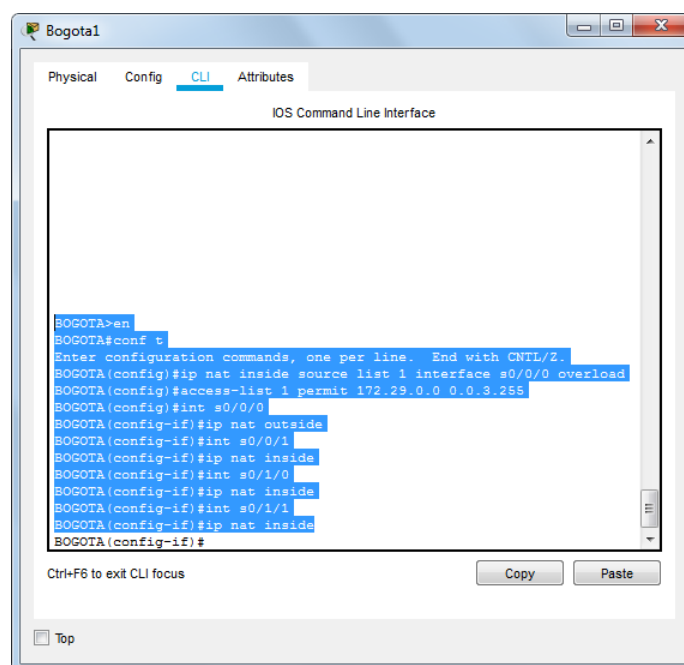
```
BOGOTA(config-if)#ip nat inside
```

```
BOGOTA(config-if)#int s0/1/0
```

```
BOGOTA(config-if)#ip nat inside
```

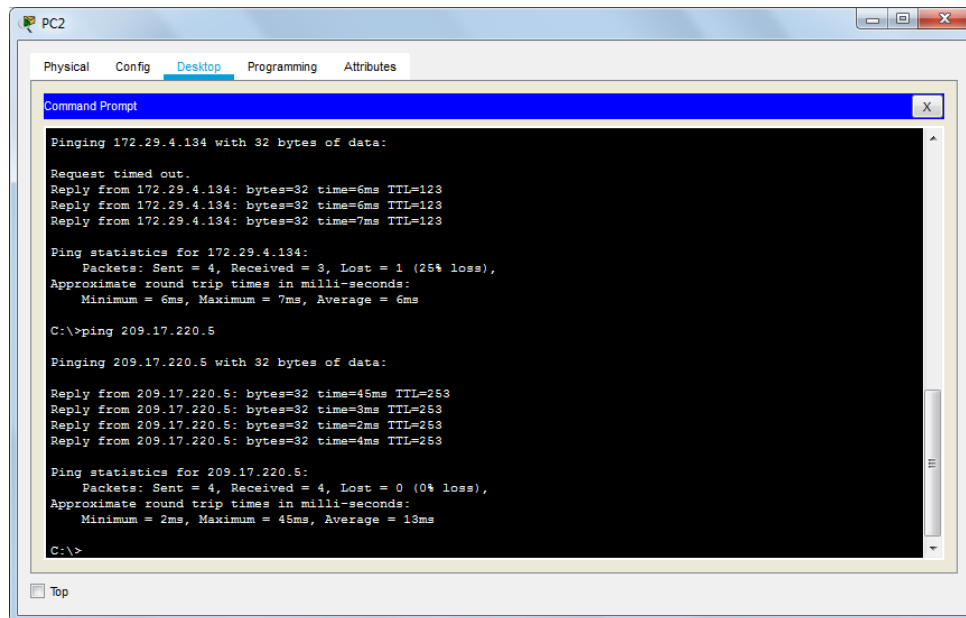
```
BOGOTA(config-if)#int s0/1/1
```

```
BOGOTA(config-if)#ip nat inside
```



```
BOGOTA>en
BOGOTA#conf t
Enter configuration commands, one per line. End with CNTL/Z.
BOGOTA(config)#ip nat inside source list 1 interface s0/0/0 overload
BOGOTA(config)#access-list 1 permit 172.29.0.0 0.0.3.255
BOGOTA(config)#int s0/0/0
BOGOTA(config-if)#ip nat outside
BOGOTA(config-if)#int s0/0/1
BOGOTA(config-if)#ip nat inside
BOGOTA(config-if)#int s0/1/0
BOGOTA(config-if)#ip nat inside
BOGOTA(config-if)#int s0/1/1
BOGOTA(config-if)#ip nat inside
BOGOTA(config-if)#
```

Bogota1



The screenshot shows a Windows Command Prompt window titled 'Command Prompt' with a blue header bar. The window is open on a 'PC2' desktop environment, with tabs for 'Physical', 'Config', 'Desktop', 'Programming', and 'Attributes'. The 'Desktop' tab is active. The command prompt displays the following text:

```
Pinging 172.29.4.134 with 32 bytes of data:
Request timed out.
Reply from 172.29.4.134: bytes=32 time=6ms TTL=123
Reply from 172.29.4.134: bytes=32 time=6ms TTL=123
Reply from 172.29.4.134: bytes=32 time=7ms TTL=123

Ping statistics for 172.29.4.134:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 6ms, Maximum = 7ms, Average = 6ms

C:\>ping 209.17.220.5

Pinging 209.17.220.5 with 32 bytes of data:

Reply from 209.17.220.5: bytes=32 time=45ms TTL=253
Reply from 209.17.220.5: bytes=32 time=3ms TTL=253
Reply from 209.17.220.5: bytes=32 time=2ms TTL=253
Reply from 209.17.220.5: bytes=32 time=4ms TTL=253

Ping statistics for 209.17.220.5:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 2ms, Maximum = 45ms, Average = 13ms

C:\>
```

ping 209.17.220.5 conexión exitosa

## Configuración del servicio DHCP.

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

### Medellin 2

Router>en

Router#conf t

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

Router(config)#ip dhcp excluded-address 172.29.4.1 172.29.4.5

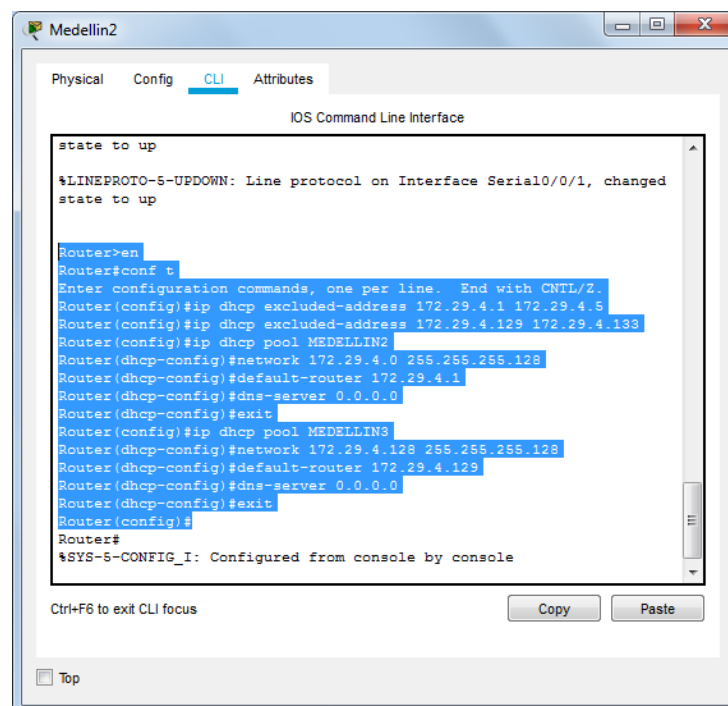
Router(config)#ip dhcp excluded-address 172.29.4.129 172.29.4.133

Router(config)#ip dhcp pool MEDELLIN2

Router(dhcp-config)#network 172.29.4.0 255.255.255.128

Router(dhcp-config)#default-router 172.29.4.1

```
Router(dhcp-config)#dns-server 0.0.0.0
Router(dhcp-config)#exit
Router(config)#ip dhcp pool MEDELLIN3
Router(dhcp-config)#network 172.29.4.128 255.255.255.128
Router(dhcp-config)#default-router 172.29.4.129
Router(dhcp-config)#dns-server 0.0.0.0
Router(dhcp-config)#exit
Router(config)#
```



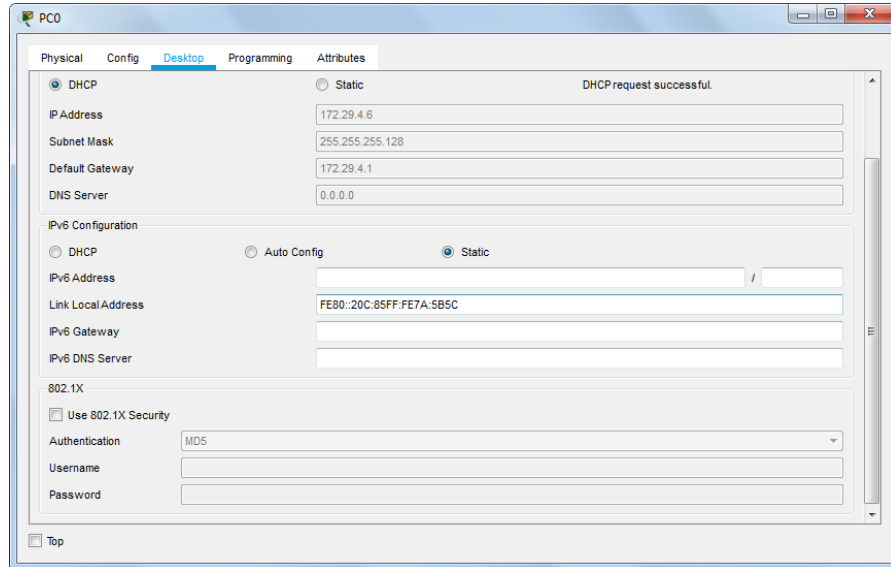
The screenshot shows a window titled "Medellin2" with tabs for "Physical", "Config", "CLI", and "Attributes". The "CLI" tab is active, displaying the "IOS Command Line Interface". The terminal output shows the following commands and their results:

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

Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ip dhcp excluded-address 172.29.4.1 172.29.4.5
Router(config)#ip dhcp excluded-address 172.29.4.129 172.29.4.133
Router(dhcp-config)#ip dhcp pool MEDELLIN2
Router(dhcp-config)#network 172.29.4.0 255.255.255.128
Router(dhcp-config)#default-router 172.29.4.1
Router(dhcp-config)#dns-server 0.0.0.0
Router(dhcp-config)#exit
Router(config)#ip dhcp pool MEDELLIN3
Router(dhcp-config)#network 172.29.4.128 255.255.255.128
Router(dhcp-config)#default-router 172.29.4.129
Router(dhcp-config)#dns-server 0.0.0.0
Router(dhcp-config)#exit
Router(config)#
Router#
%SYS-5-CONFIG_I: Configured from console by console
```

At the bottom of the window, there are buttons for "Copy" and "Paste", and a "Top" button.

Se configura Medellin2 donde es el servidor principal para ambas redes



```
Router>en
```

```
Router#conf t
```

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

```
Router(config)#int g0/0
```

```
Router(config-if)#ip helper-address 172.29.6.5
```

b. El router Medellín3 deberá habilitar el paso de los mensajes broadcast hacia la IP del router Medellín2.

```
Router>en
```

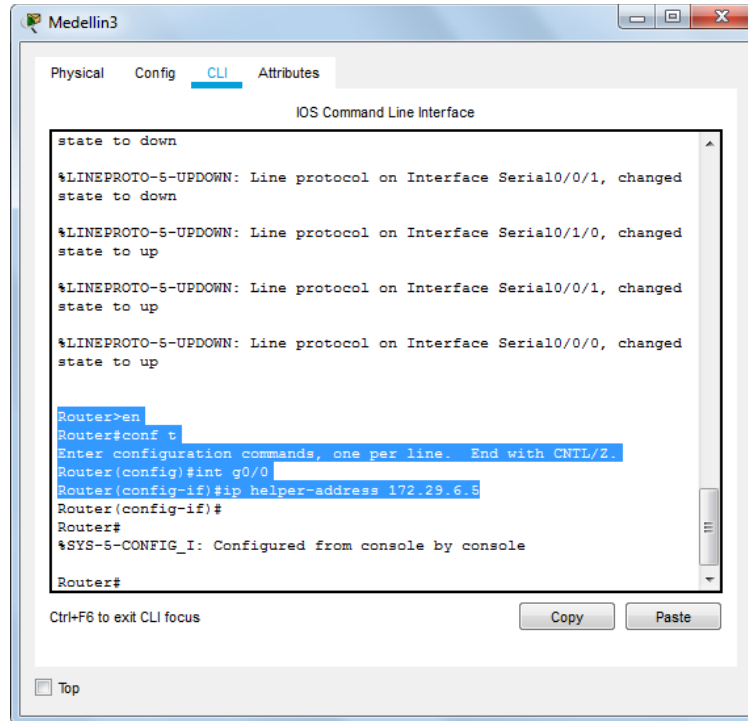
```
Router#conf t
```

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

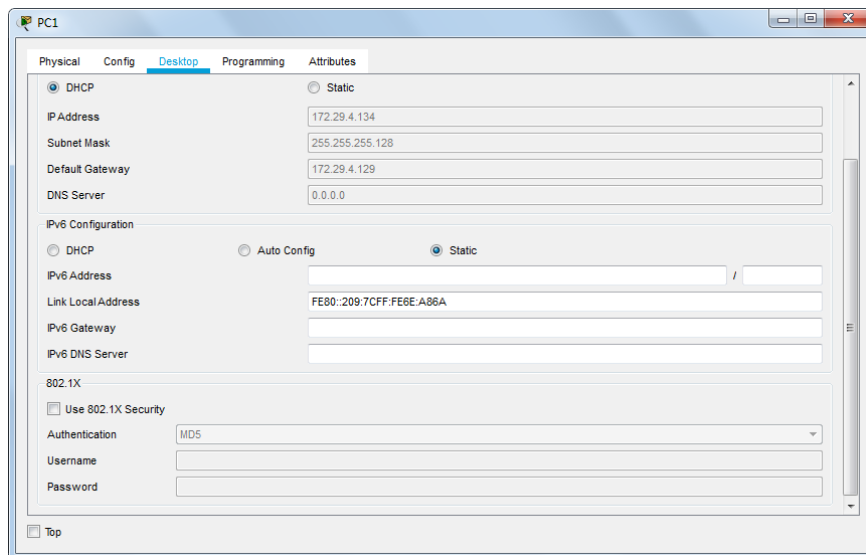
```
Router(config)#int g0/0
```

```
Router(config-if)#ip helper-address 172.29.6.5
```





Se hace un redireccionamiento para que haya comunicación con medellin2



c. Configurar la red Bogotá2 y Bogotá3 donde el router Medellín2 debe ser el servidor DHCP para ambas redes Lan.

Router>en

Router#conf t

Router(config)#ip dhcp excluded-address 172.29.1.1 172.29.1.5

```
Router(config)#ip dhcp excluded-address 172.29.0.1 172.29.0.5
```

```
Router(config)#ip dhcp pool BOGOTA2
```

```
Router(dhcp-config)#network 172.29.1.0 255.255.255.0
```

```
Router(dhcp-config)#default-router 172.29.1.1
```

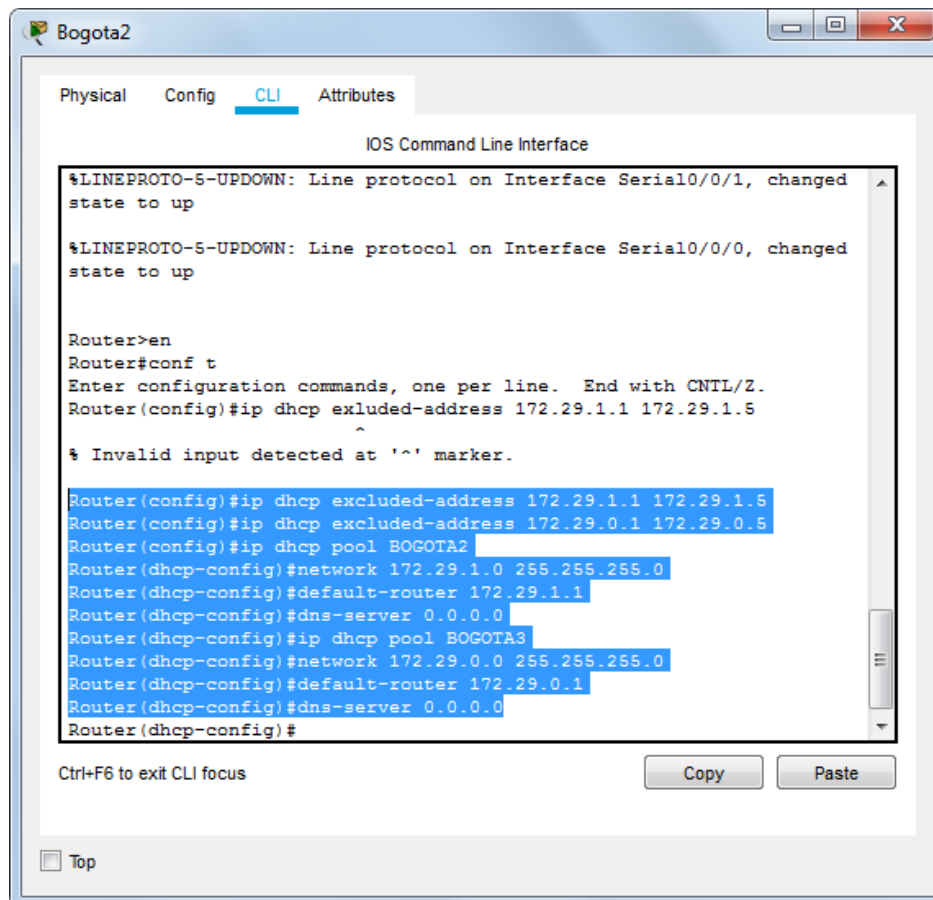
```
Router(dhcp-config)#dns-server 0.0.0.0
```

```
Router(dhcp-config)#ip dhcp pool BOGOTA3
```

```
Router(dhcp-config)#network 172.29.0.0 255.255.255.0
```

```
Router(dhcp-config)#default-router 172.29.0.1
```

```
Router(dhcp-config)#dns-server 0.0.0.0
```



The screenshot shows a window titled "Bogota2" 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 sequence of commands and responses:

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

Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ip dhcp excluded-address 172.29.1.1 172.29.1.5
^
% Invalid input detected at '^' marker.

Router(config)#ip dhcp excluded-address 172.29.1.1 172.29.1.5
Router(config)#ip dhcp excluded-address 172.29.0.1 172.29.0.5
Router(config)#ip dhcp pool BOGOTA2
Router(dhcp-config)#network 172.29.1.0 255.255.255.0
Router(dhcp-config)#default-router 172.29.1.1
Router(dhcp-config)#dns-server 0.0.0.0
Router(dhcp-config)#ip dhcp pool BOGOTA3
Router(dhcp-config)#network 172.29.0.0 255.255.255.0
Router(dhcp-config)#default-router 172.29.0.1
Router(dhcp-config)#dns-server 0.0.0.0
Router(dhcp-config)#
```

At the bottom of the window, there is a "Ctrl+F6 to exit CLI focus" message, "Copy" and "Paste" buttons, and a "Top" button.

```
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#int g0/0
Router(config-if)#ip helper-address 172.29.3.13
Router(config-if)#
Router#
%SYS-5-CONFIG_I: Configured from console by console
```

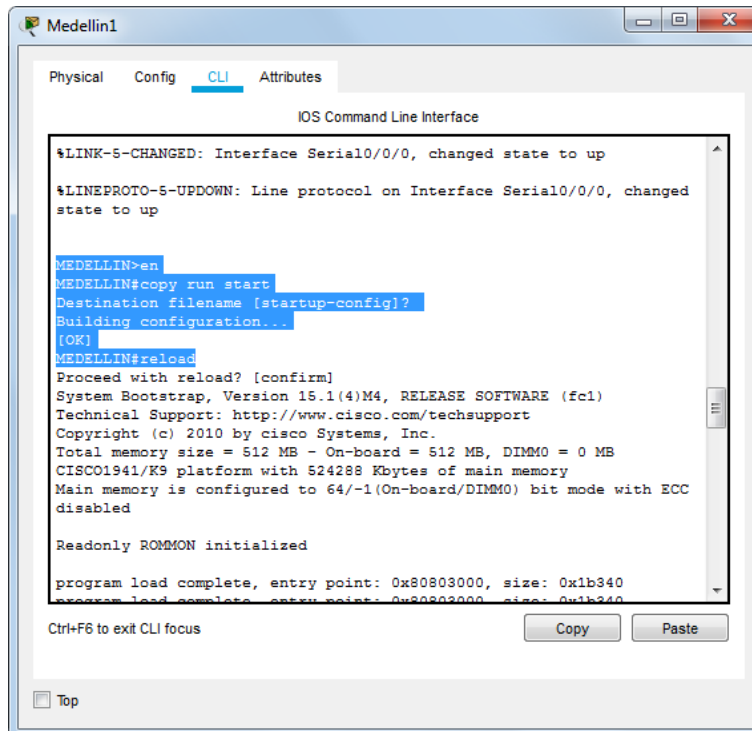
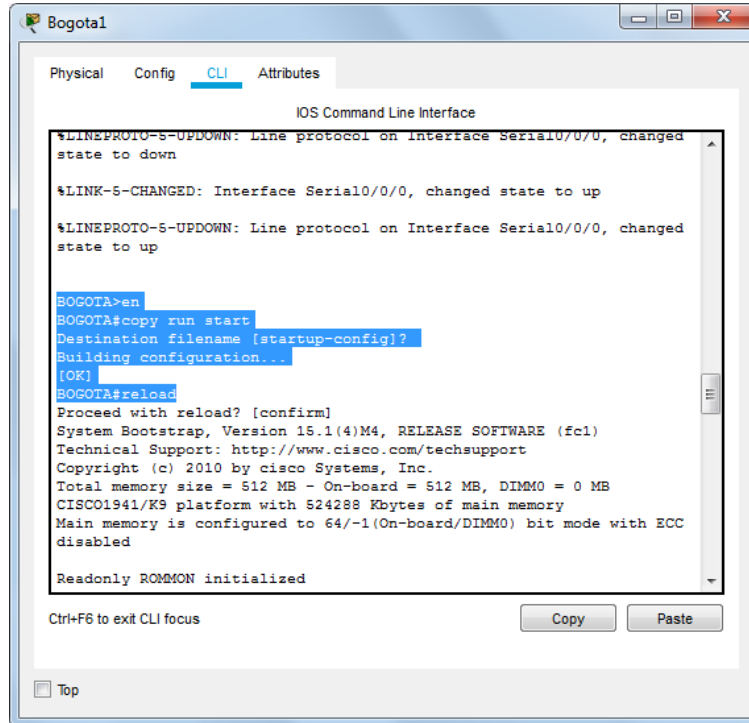
d. Configure el router Bogotá1 para que habilite el paso de los mensajes Broadcast hacia la IP del router Bogotá2.

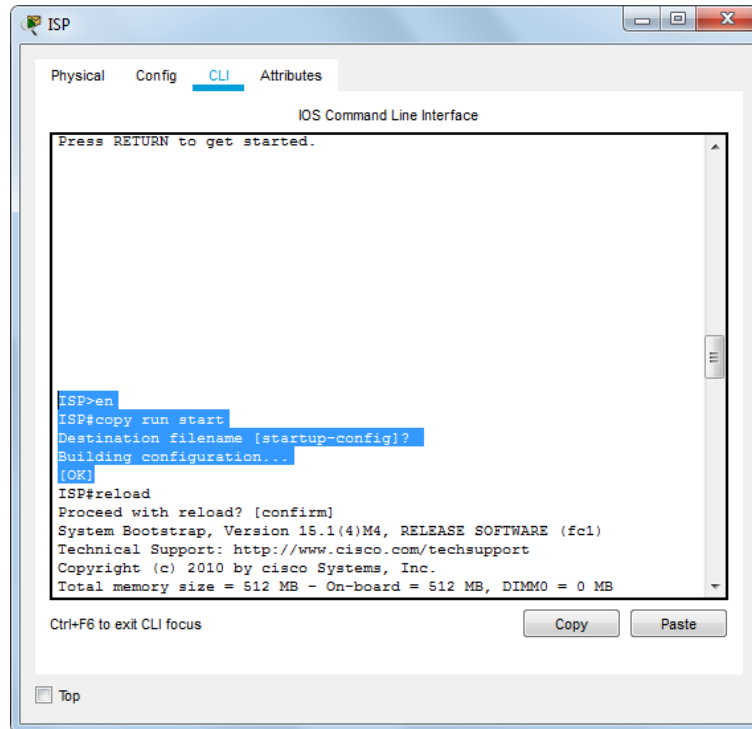
```
Router#conf t
```

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

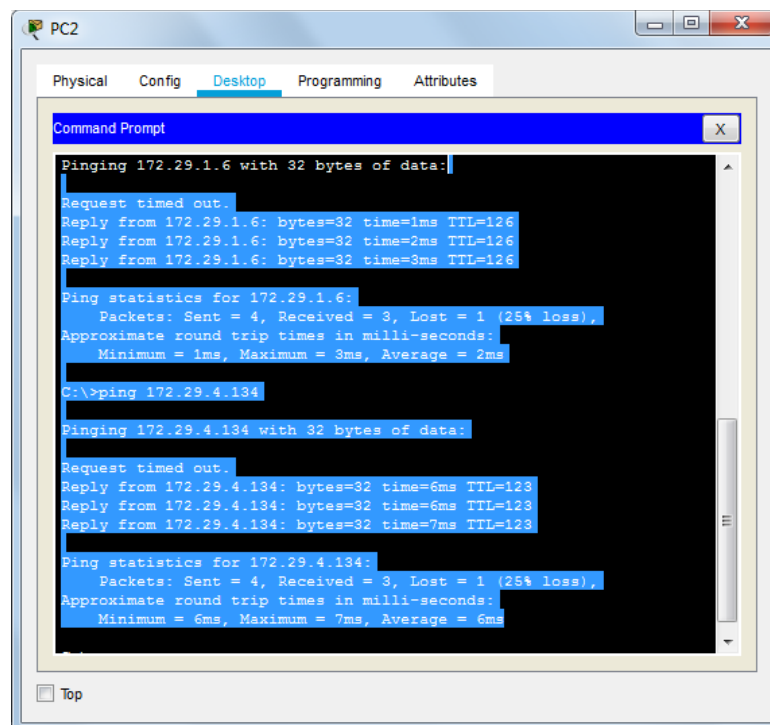
```
Router(config)#int g0/0
```

```
Router(config-if)#ip helper-address 172.29.3.13
```

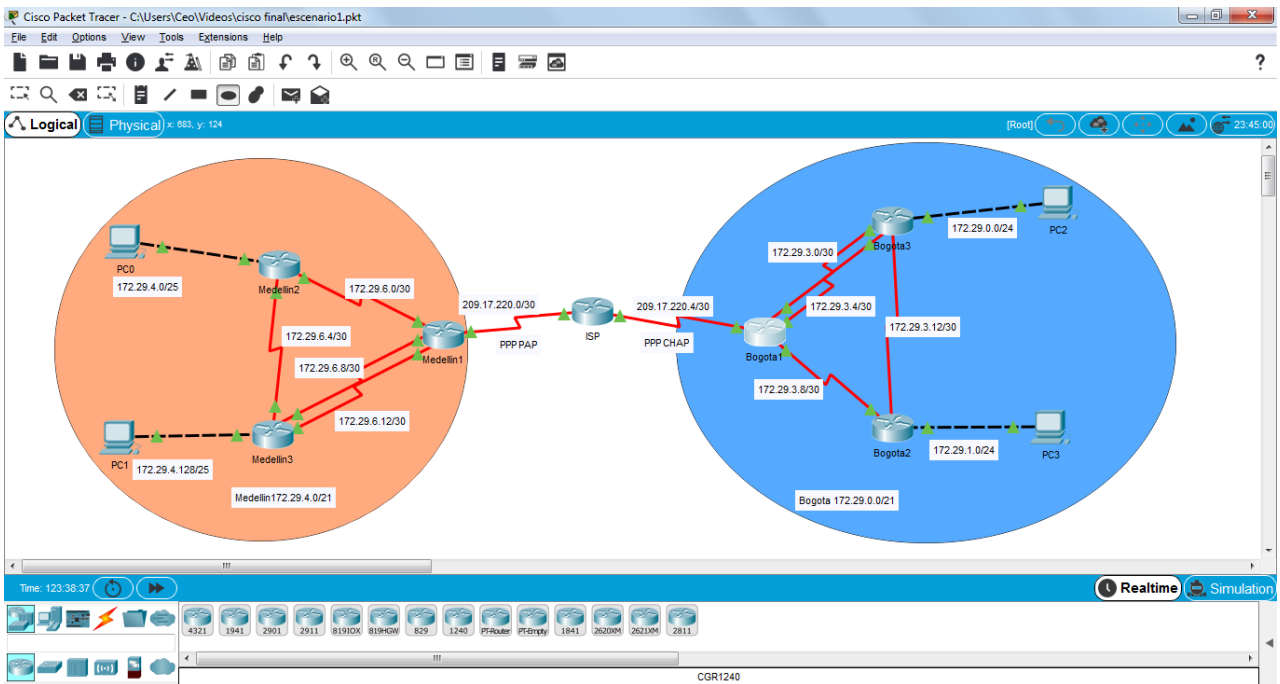




Procedemos a reiniciar los routers ISP, MEDELLIN1, BOGOTA1 guardando la configuración para poder hacer ping de las pcs



Hacemos ping desde Pc2 y las conexiones son exitosas de extremo a extremo



## ESCENARIO 2

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.

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

**R1**

Router>

Router>en

```
Router#conf t
Router(config)#hostname R1
R1(config)#no ip domain-lookup
R1(config)#int s0/0/0
R1(config-if)#description Connection to Miami
R1(config-if)#ip address 172.31.21.1 255.255.255.252
R1(config-if)#clock rate 128000
This command applies only to DCE interfaces
R1(config-if)#no shut
R1(config-if)#ip route 0.0.0.0 0.0.0.0 serial 0/0/0
```

## **R2**

```
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname R2
R2(config)#no ip domain-lookup
R2(config)#int loopback0
R2(config-if)#description simulated web server
R2(config-if)#ip address 10.10.10.10 255.255.255.255
R2(config-if)#int f0/0
R2(config-if)#description connection to ISP
R2(config-if)#ip address 209.165.200.225 255.255.255.248
R2(config-if)#no shut

R2(config-if)#int s0/0/1
R2(config-if)#description connection to Bogota
R2(config-if)#ip address 172.31.21.2 255.255.255.252
R2(config-if)#no shut
R2(config-if)#int s0/0/0
```

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

```
R2(config-if)#ip route 0.0.0.0 0.0.0.0 f0/0
```

### **R3**

```
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname R3
R3(config)#no ip domain-lookup
R3(config)#int loopback4
```

```
R3(config-if)#ip address 192.168.4.1 255.255.255.0
R3(config-if)#int loopback5
```

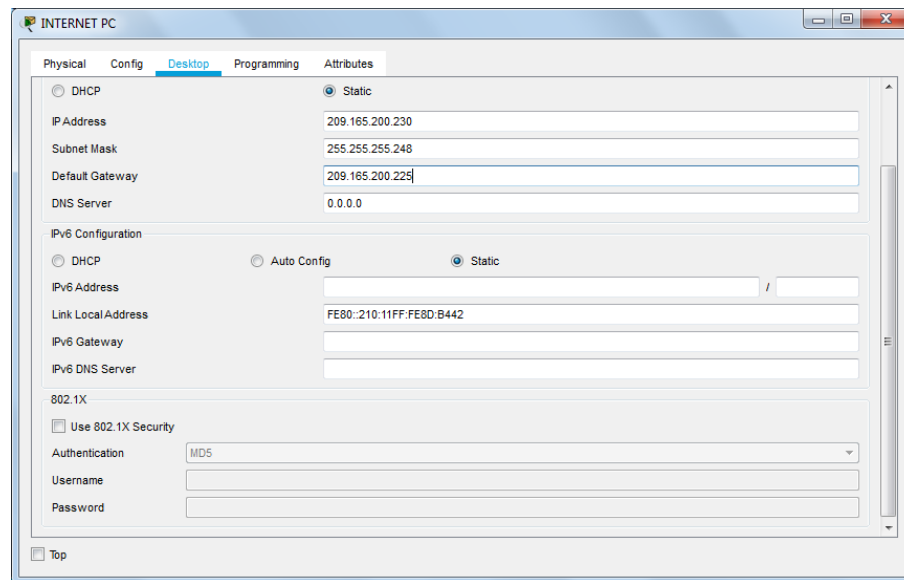
```
R3(config-if)#ip address 192.168.5.1 255.255.255.0
R3(config-if)#int loopback6
```

```
R3(config-if)#ip address 192.168.6.1 255.255.255.0
R3(config-if)#int s0/0/1
R3(config-if)#description connection to Miami
R3(config-if)#ip address 172.31.23.2 255.255.255.252
R3(config-if)#no shut
```

```
R3(config-if)#ip route 0.0.0.0 0.0.0.0 s0/0/1
```



## Configuración IP Internet PC



## Switch S1

```
Switch>en
```

```
Switch#conf t
```

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

```
Switch(config)#hostname s1
```

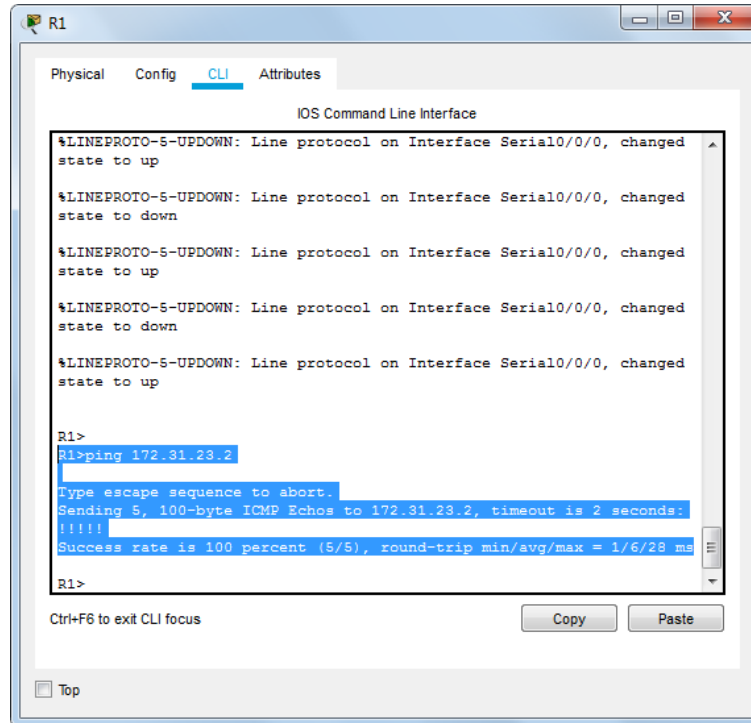
```
s1(config)#no ip domain-lookup
```

## Switch S3

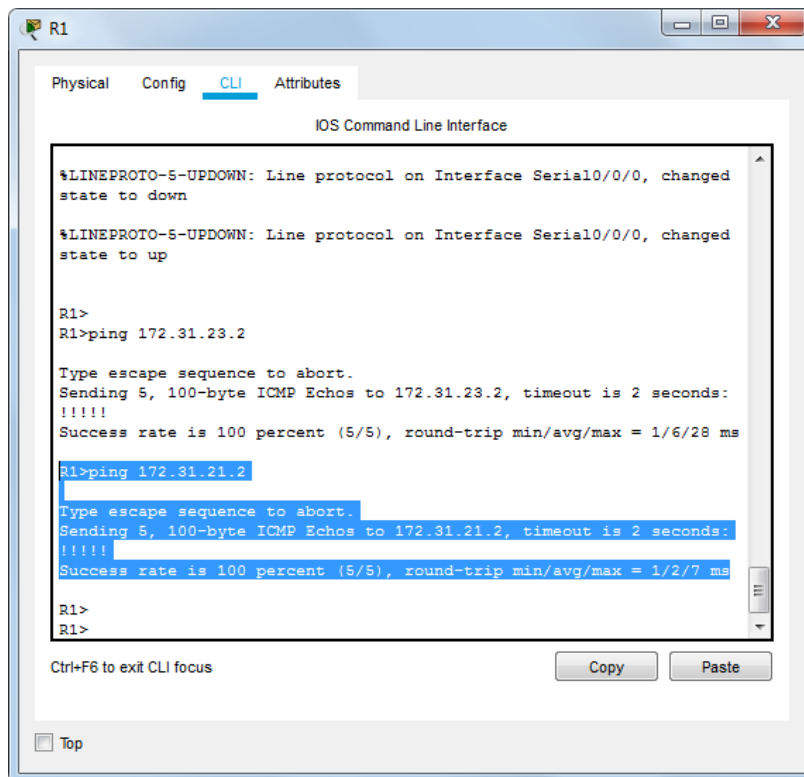
```
Switch>en
```

```
Switch#conf t
```

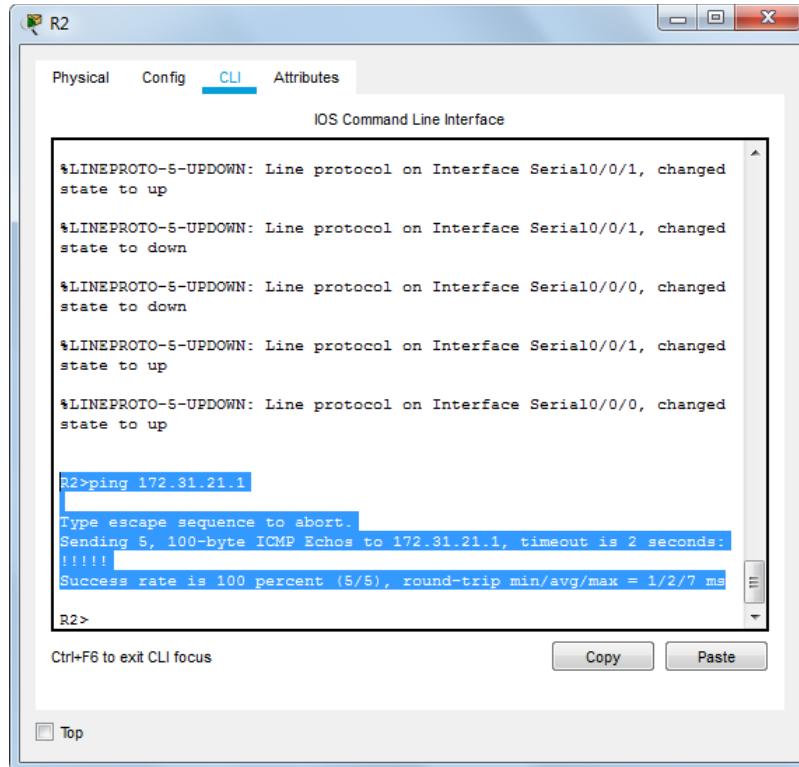
```
Switch(config)#hostname S3
```



Hacemos ping del Router R1 a la ip 172.31.23.2



Hacemos ping del Router R1 a la ip 172.31.21.2



Hacemos ping del Router R2 a la ip 172.31.21.1

Configurar el protocolo de enrutamiento OSPFv2 bajo los siguientes criterios:

### OSPFv2 area 0

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

Verificar información de OSPF

Visualizar tablas de enrutamiento y routers conectados por OSPFv2

## R1

```
R1>en
```

```
R1#conf t
```

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

```
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 192.168.99.0 0.0.0.255 area 0
```

```
R1(config-router)#passive-interface default
```

```
R1(config-router)#auto-cost reference-bandwidth 1000
```

```
R1(config-router)#int s0/0/0
```

```
R1(config-if)#bandwidth 256
```

```
R1(config-if)#ip ospf cost 9500
```

## R2

```
R2>en
```

```
R2#conf t
```

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

```
R2(config)#router ospf 1
```

```
R2(config-router)#router-id 5.5.5.5
```

```
R2(config-router)#network 10.10.10.10 0.0.0.0 area 0
```

```
R2(config-router)#network 172.31.21.0 0.0.0.3 area 0
```

```
R2(config-router)#network 172.31.23.0 0.0.0.3 area 0
```

```
R2(config-router)#passive-interface Loopback0
R2(config-router)#passive-interface f0/1
R2(config-router)#int s0/0/0
R2(config-if)#bandwidth 256
R2(config-if)#ip ospf cost 9500
R2(config-if)#int s0/0/1
R2(config-if)#bandwidth 256
R2(config-if)#ip ospf cost 9500
```

### **R3**

```
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 8.8.8.8
R3(config-router)#passive-interface Loopback4
R3(config-router)#passive-interface Loopback5
R3(config-router)#passive-interface Loopback6
R3(config-router)#auto-cost reference-bandwidth 1000
% OSPF: Reference bandwidth is changed.
Please ensure reference bandwidth is consistent across all routers.
R3(config-router)#network 172.31.23.0 0.0.0.3 area 0
R3(config-router)#network 192.168.4.0 0.0.3.255 area 0
R3(config-router)#int s0/0/1
R3(config-if)#bandwidth 256
R3(config-if)#ip ospf cost 9500
```

R1

Physical Config **CLI** Attributes

IOS Command Line Interface

```

R1(config-router)#network 192.168.99.0 0.0.0.255 area 0
R1(config-router)#passive-interface default
R1(config-router)#no passive-interface s0/0/0
R1(config-router)#auto-cost reference-bandwidth 1000
R1(config-router)#int s0/0/0
R1(config-if)#bandwidth 256
R1(config-if)#ip ospf cost 9500
R1(config-if)#
05:23:39: %OSPF-5-ADJCHG: Process 1, Nbr 5.5.5.5 on Serial0/0/0 from
LOADING to FULL, Loading Done

R1(config-if)#exit
R1(config)#exit
R1#
%SYS-5-CONFIG_I: Configured from console by console

R1#show ip ospf neig

```

Neighbor ID	Pri	State	Dead Time	Address	
Interface					
5.5.5.5	0	FULL/	-	00:00:34	172.31.21.2
Serial0/0/0					

R1#

Ctrl+F6 to exit CLI focus

Copy Paste

Top

R2

Physical Config **CLI** Attributes

IOS Command Line Interface

```

R2(config-router)#network 172.31.21.0 0.0.0.3 area 0
R2(config-router)#network 172.31.23.0 0.0.0.3 area 0
R2(config-router)#passive-interface Loopback0
R2(config-router)#passive-interface f0/1
R2(config-router)#int s0/0/0
R2(config-if)#bandwidth 256
R2(config-if)#ip ospf cost 9500
R2(config-if)#int s0/0/1
R2(config-if)#bandwidth 256
R2(config-if)#ip ospf cost 9500
R2(config-if)#
R2(config-if)#exit
R2(config)#exit
R2#
%SYS-5-CONFIG_I: Configured from console by console

R2#show ip ospf neig

```

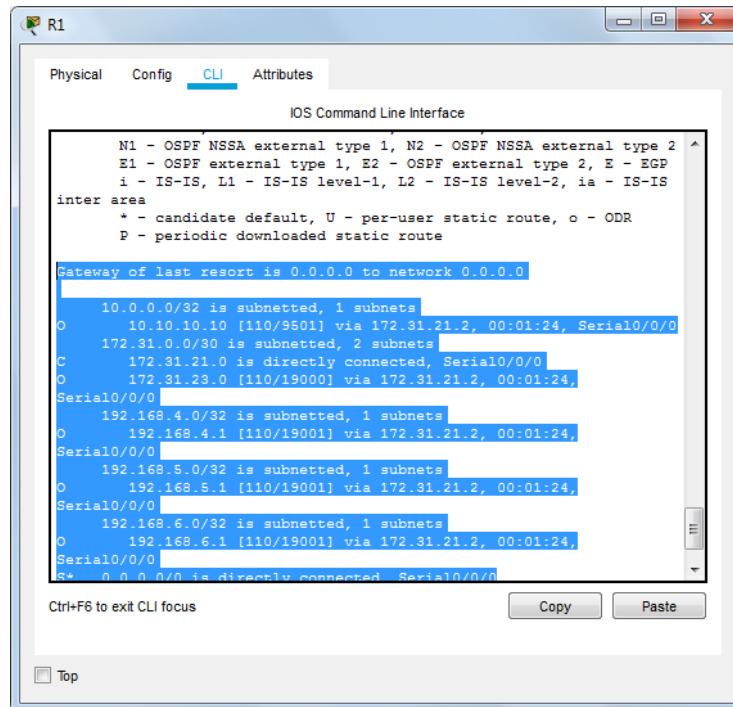
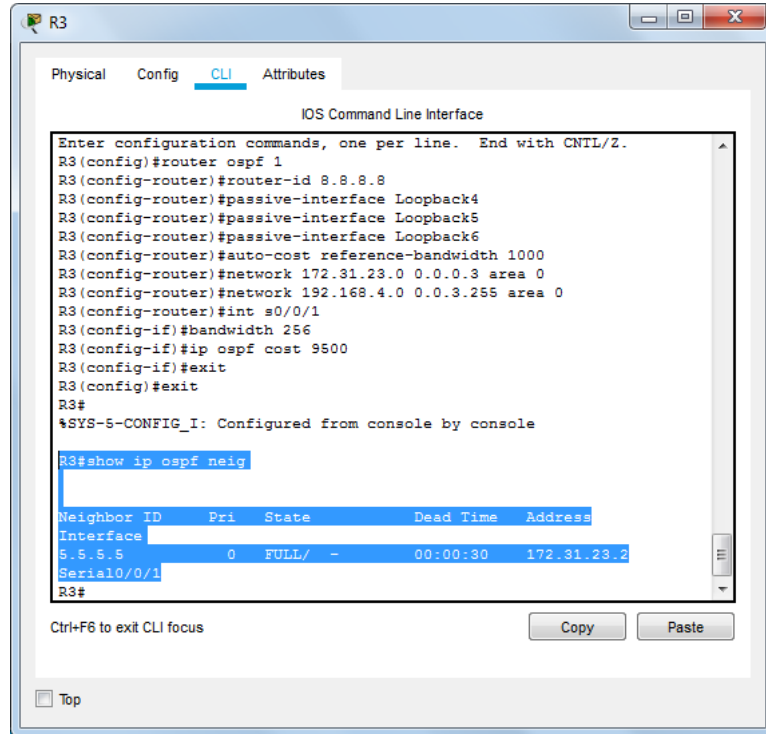
Neighbor ID	Pri	State	Dead Time	Address	
Interface					
8.8.8.8	0	FULL/	-	00:00:35	172.31.23.2
Serial0/0/0					

R2#

Ctrl+F6 to exit CLI focus

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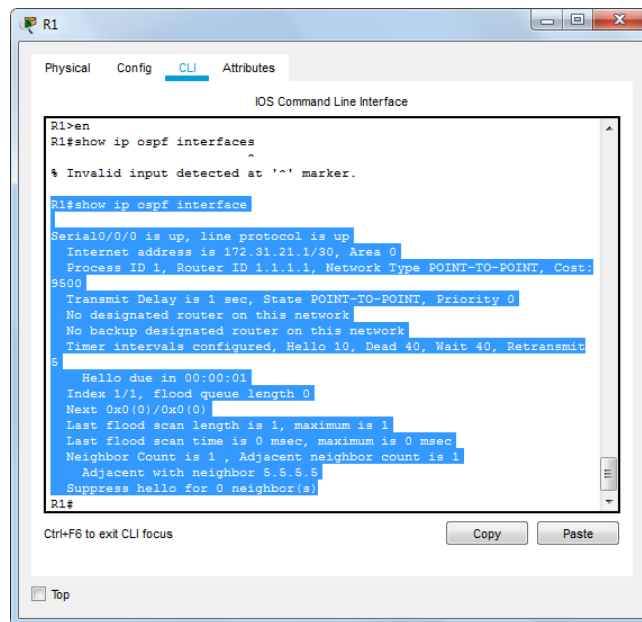
Top



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

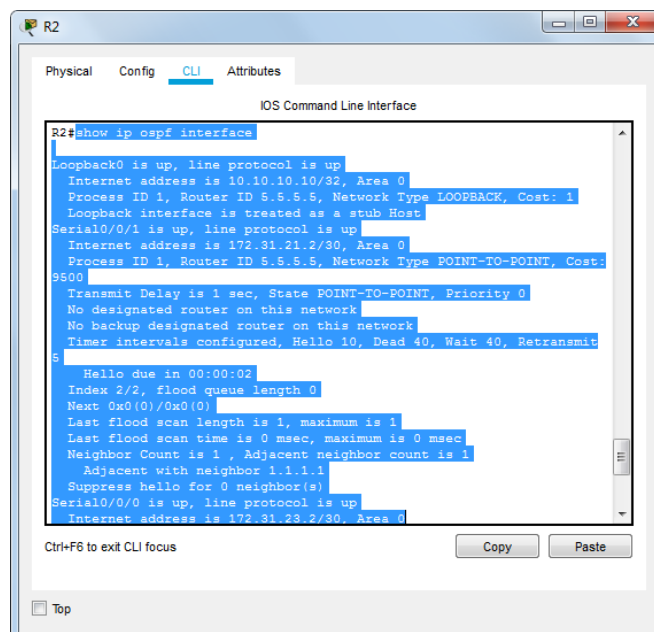
R1

R1#show ip ospf interface



```
R1>en
R1#show ip ospf interfaces
% Invalid input detected at '^' marker.
R1#show ip ospf interface
Serial0/0/0 is up, line protocol is up
  Internet address is 172.31.21.1/30, Area 0
  Process ID 1, Router ID 1.1.1.1, Network Type POINT-TO-POINT, Cost:
9500
  Transmit Delay is 1 sec, State POINT-TO-POINT, Priority 0
  No designated router on this network
  No backup designated router on this network
  Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit
5
  Hello due in 00:00:01
  Index 1/1, flood queue length 0
  Next 0x0(0)/0x0(0)
  Last flood scan length is 1, maximum is 1
  Last flood scan time is 0 msec, maximum is 0 msec
  Neighbor Count is 1, Adjacent neighbor count is 1
    Adjacent with neighbor 5.5.5.5
  Suppress hello for 0 neighbor(s)
R1#
```

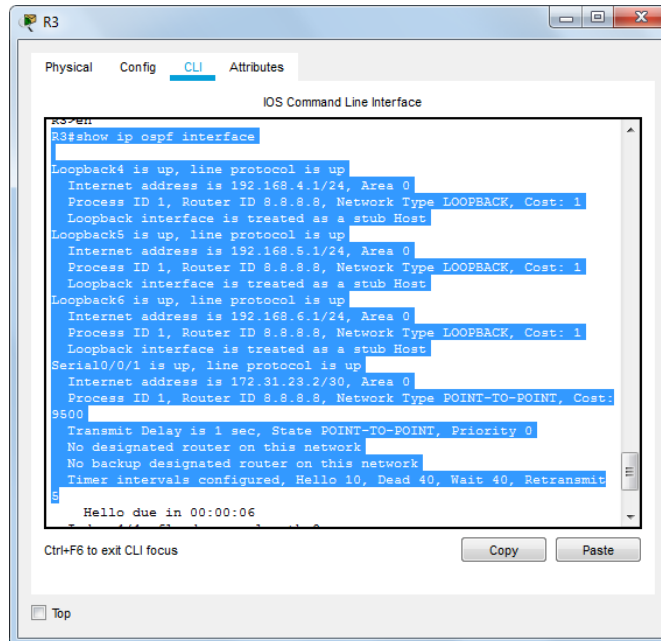
R2



```
R2#show ip ospf interface
Loopback0 is up, line protocol is up
  Internet address is 10.10.10.10/32, Area 0
  Process ID 1, Router ID 5.5.5.5, Network Type LOOPBACK, Cost: 1
  Loopback interface is treated as a stub Host
Serial0/0/1 is up, line protocol is up
  Internet address is 172.31.21.2/30, Area 0
  Process ID 1, Router ID 5.5.5.5, Network Type POINT-TO-POINT, Cost:
9500
  Transmit Delay is 1 sec, State POINT-TO-POINT, Priority 0
  No designated router on this network
  No backup designated router on this network
  Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit
5
  Hello due in 00:00:02
  Index 2/2, 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 172.31.23.2/30, Area 0
```



## R3

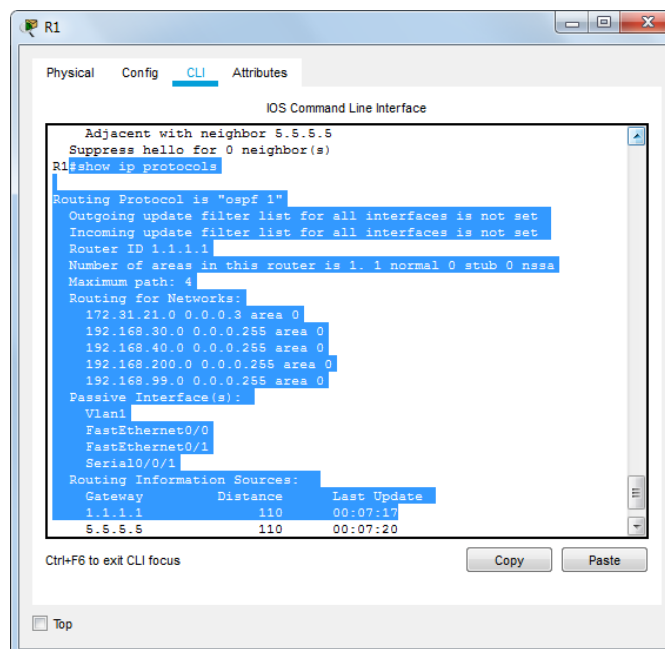


```
R3#show ip ospf interface
Loopback4 is up, line protocol is up
  Internet address is 192.168.4.1/24, Area 0
  Process ID 1, Router ID 8.8.8.8, Network Type LOOPBACK, Cost: 1
  Loopback interface is treated as a stub Host
Loopback5 is up, line protocol is up
  Internet address is 192.168.5.1/24, Area 0
  Process ID 1, 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 1, Router ID 8.8.8.8, Network Type LOOPBACK, Cost: 1
  Loopback interface is treated as a stub Host
Serial0/0/1 is up, line protocol is up
  Internet address is 172.31.23.2/30, Area 0
  Process ID 1, Router ID 8.8.8.8, Network Type POINT-TO-POINT, Cost:
3500
  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
```

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

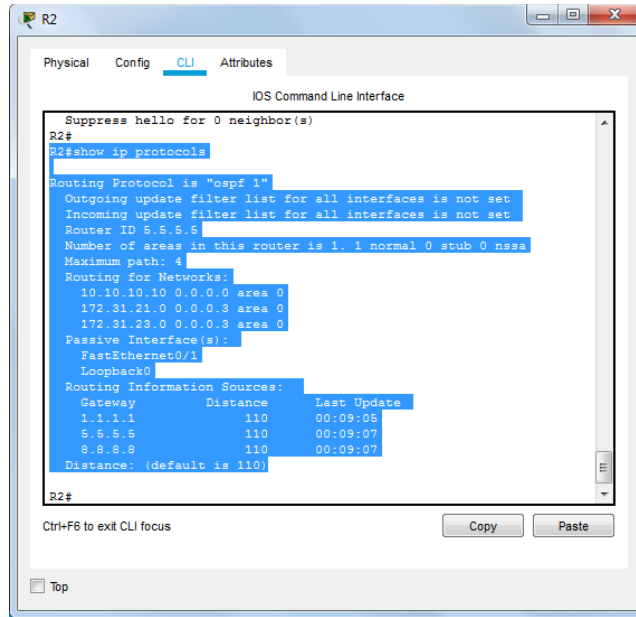
## R1

R1#show ip protocols



```
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):
    Vlan1
    FastEthernet0/0
    FastEthernet0/1
    Serial0/0/1
  Routing Information Sources:
    Gateway         Distance      Last Update
    1.1.1.1          110          00:07:17
    5.5.5.5          110          00:07:20
```

R2



Physical Config CLI Attributes

IOS Command Line Interface

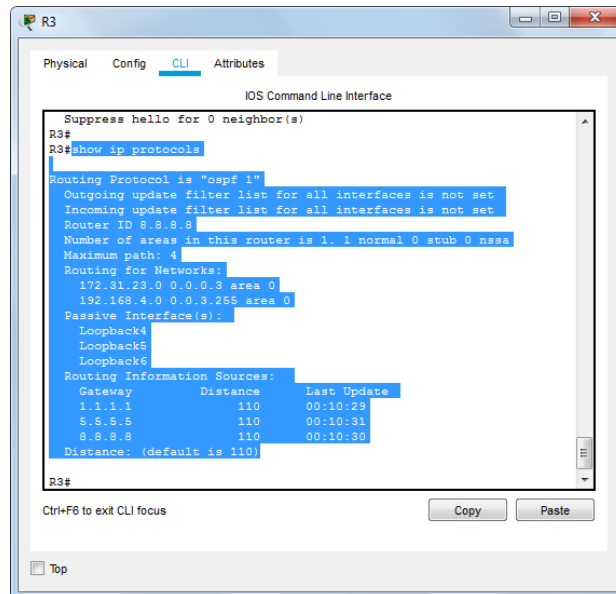
```
Suppress hello for 0 neighbor(s)
R2#
R2#show ip protocols
Routing Protocol is "ospf 1"
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Router ID 5.5.5.5
  Number of areas in this router is 1. 1 normal 0 stub 0 nssa
  Maximum path: 4
  Routing for Networks:
    10.10.10.10 0.0.0.0 area 0
    172.31.21.0 0.0.0.3 area 0
    172.31.23.0 0.0.0.3 area 0
  Passive Interface(s):
    FastEthernet0/1
    Loopback0
  Routing Information Sources:
    Gateway         Distance      Last Update
    1.1.1.1           110          00:09:05
    5.5.5.5           110          00:09:07
    8.8.8.8           110          00:09:07
  Distance: (default is 110)
R2#
```

Ctrl+F6 to exit CLI focus

Copy Paste

Top

R3



Physical Config CLI Attributes

IOS Command Line Interface

```
Suppress hello for 0 neighbor(s)
R3#
R3#show ip protocols
Routing Protocol is "ospf 1"
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Router ID 8.8.8.8
  Number of areas in this router is 1. 1 normal 0 stub 0 nssa
  Maximum path: 4
  Routing for Networks:
    172.31.23.0 0.0.0.3 area 0
    192.168.4.0 0.0.3.255 area 0
  Passive Interface(s):
    Loopback4
    Loopback5
    Loopback6
  Routing Information Sources:
    Gateway         Distance      Last Update
    1.1.1.1           110          00:10:29
    5.5.5.5           110          00:10:31
    8.8.8.8           110          00:10:30
  Distance: (default is 110)
R3#
```

Ctrl+F6 to exit CLI focus

Copy Paste

Top

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

## **R1**

```
R1#en
```

```
R1#conf t
```

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

```
R1(config)#int f0/0.30
```

```
R1(config-subif)#description Accounting LAN
```

```
R1(config-subif)#encapsulation dot1Q 30
```

```
R1(config-subif)#ip address 192.168.30.1 255.255.255.0
```

```
R1(config-subif)#int f0/0.40
```

```
R1(config-subif)#description MERCADEO LAN
```

```
R1(config-subif)#encapsulation dot1Q 40
```

```
R1(config-subif)#ip address 192.168.40.1 255.255.255.0
```

```
R1(config-subif)#int f0/0.200
```

```
R1(config-subif)#description Mantenimiento LAN
```

```
R1(config-subif)#encapsulation dot1Q 200
```

```
R1(config-subif)#ip address 192.168.200.1 255.255.255.0
```

```
R1(config-subif)#exit
```

```
R1(config)#int f0/0
```

```
R1(config-if)#no shut
```

## **Switch S1**

```
s1>en
```

```
s1#conf t
```

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)#int f0/1
```

```
S1(config-if)#switchport access vlan 30
```

```
S1(config-if)#switchport mode access
```

```
S1(config-if)#interface range FastEthernet0/2, FastEthernet0/4-23
```

```
S1(config-if-range)#switchport mode access
```

```
S1(config-if-range)#int f0/24
```

```
S1(config-if)#switchport mode access
```

```
S1(config-if)#int f0/3
```

```
S1(config-if)#switchport mode trunk
```

### **Switch S3**

```
S3>en
```

```
S3#conf t
```

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

```
S3(config)#vlan 30
```

```
S3(config-vlan)#name ADMINISTRACION
```

```
S3(config-vlan)#vlan 40
```

```
S3(config-vlan)#name MERCADEO
```

```
S3(config-vlan)#vlan 200
```

```
S3(config-vlan)#name MANTENIMIENTO
```

```
S3(config-vlan)#int f0/1
```

```
S3(config-if)#switchport access vlan 40
```

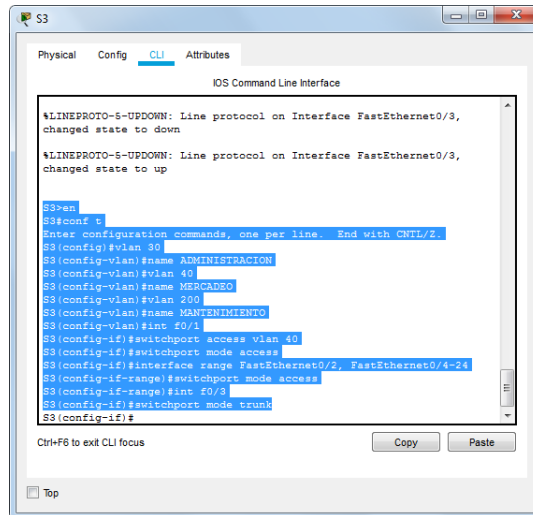
```
S3(config-if)#switchport mode access
```

```
S3(config-if)#interface range FastEthernet0/2, FastEthernet0/4-24
```

```
S3(config-if-range)#switchport mode access
```

```
S3(config-if-range)#int f0/3
```

```
S3(config-if)#switchport mode trunk
```



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

$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

S3>en
S3#conf t
Enter configuration commands, one per line. End with CNTL/Z.
S3(config)#vlan 30
S3(config-vlan)#name ADMINISTRACION
S3(config-vlan)#vlan 40
S3(config-vlan)#name MERCADERO
S3(config-vlan)#vlan 200
S3(config-vlan)#name MANTENIMIENTO
S3(config-vlan)#int f0/1
S3(config-if)#switchport access vlan 40
S3(config-if)#switchport mode access
S3(config-if)#interface range FastEthernet0/2, FastEthernet0/4-24
S3(config-if-range)#switchport mode access
S3(config-if-range)#int f0/3
S3(config-if)#switchport mode trunk
S3(config-if)#

Ctrl+F6 to exit CLI focus
```

En el Switch 3 deshabilitar DNS lookup

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

Asignar direcciones IP a los Switches acorde a los lineamientos.

**S1**

```
S1(config-if)#int vlan 200
```

```
S1(config-if)#ip address 192.168.99.2 255.255.255.0
```

```
S1(config-if)#no shut
```

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

### S3

```
S3#en
```

```
S3#conf t
```

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

```
S3(config)#int vlan 200
```

```
S3(config-if)#ip add 192.168.99.3 255.255.255.0
```

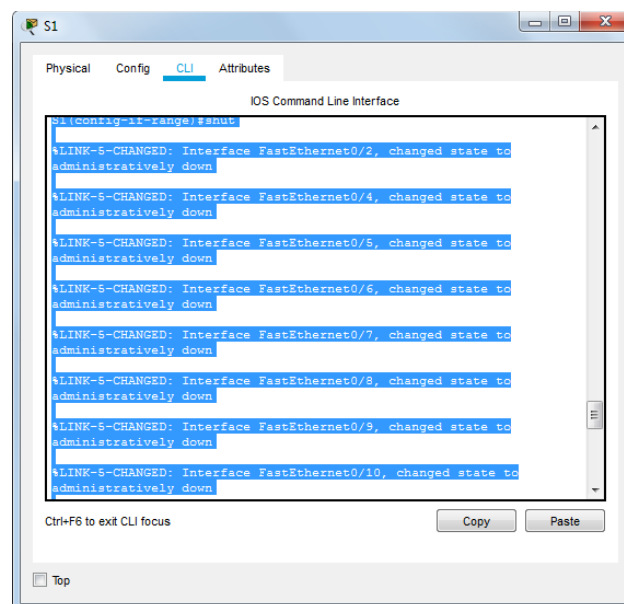
```
S3(config-if)#no shut
```

```
S3(config-if)#ip default-gateway 192.168.99.1
```

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

```
S1(config)#interface range FastEthernet0/2, FastEthernet0/4-23
```

```
S1(config-if-range)#shut
```



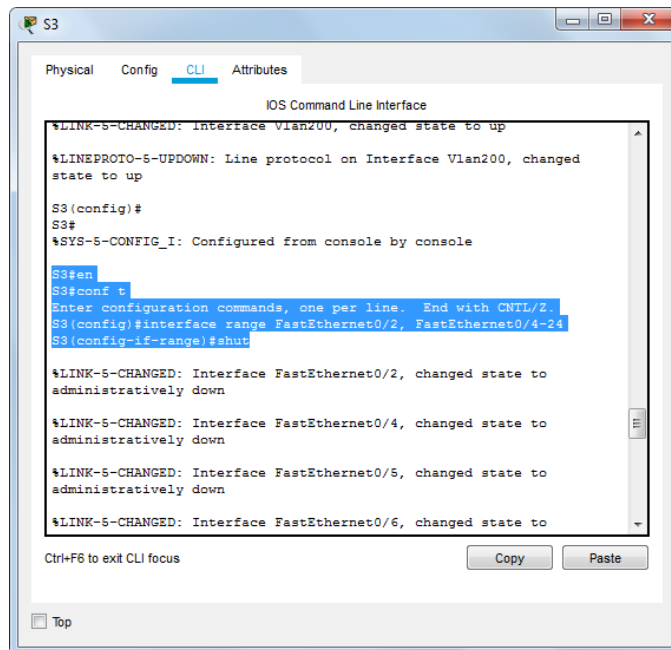
S3

S3#en

S3#conf t

S3(config)#interface range FastEthernet0/2, FastEthernet0/4-24

S3(config-if-range)#shut



Implement DHCP and NAT for IPv4

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

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

```

R1(config)#ip dhcp excluded-address 192.168.40.1
R1(config)#ip dhcp pool Administracion
R1(dhcp-config)#Network 192.168.30.0 255.255.255.0
R1(dhcp-config)#default-router 192.168.30.1
R1(dhcp-config)#dns-server 10.10.10.11
R1(dhcp-config)#ip domain-name ccna-unad.com
R1(config)#ip dhcp pool Mercadeo
R1(dhcp-config)#network 192.168.40.0 255.255.255.0
R1(dhcp-config)#default-router 192.168.40.1
R1(dhcp-config)#dns-server 10.10.10.11
R1(dhcp-config)#ip domain-name ccna-unad.com

```

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

```

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.

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



## R2

```
R2>en
```

```
R2#conf t
```

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

```
R2(config)#ip nat pool ISP 209.165.200.225 209.165.200.228 netmask 255.255.255.248
```

```
R2(config)#ip nat inside source list 1 pool ISP
```

```
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)#interface Loopback0
```

```
R2(config-if)#ip nat inside
```

```
R2(config-if)#INT f0/0
```

```
R2(config-if)#ip nat outside
```

```
R2(config-if)#int s0/0/0
```

```
R2(config-if)#ip nat inside
```

```
R2(config-if)#int s0/0/1
```

```
R2(config-if)#ip nat inside
```

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

```
R2>en
```

```
R2#conf t
```

```
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)#ip nat pool ISP 209.165.200.225 209.165.200.228 netmask 255.255.255.248
```

```
R2(config)#ip nat inside source list 1 pool ISP
```

```
R2(config)#ip access-list standar Administracion
```

```
R2(config-std-nacl)#permit host 172.31.21.1
```

```
R2(config-std-nacl)#exit
R2(config)#line vty 0 4
R2(config-line)#access-class Administracion in
```

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

```
R2#en
R2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#access-list 101 permit tcp any host 209.165.200.229 eq www
R2(config)#access-list 101 permit icmp any any echo-reply
R2(config)#int f0/0
R2(config-if)#ip access-group 101 in
R2(config-if)#int s0/0/0
R2(config-if)#ip access-group 101 out
R2(config-if)#int s0/0/1
R2(config-if)#ip access-group 101 out
R2(config-if)#int f0/1
R2(config-if)#ip access-group 101 out
```

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

**PC-A**

PC-A

Physical Config **Desktop** Programming Attributes

DHCP  Static DHCP failed. APPA is being used.

IP Address 169.254.130.97

Subnet Mask 255.255.0.0

Default Gateway 0.0.0.0

DNS Server 0.0.0.0

IPv6 Configuration

DHCP  Auto Config  Static

IPv6 Address /

Link Local Address FE80::2D0:D3FF:FE0D:8261

IPv6 Gateway

IPv6 DNS Server

802.1X

Use 802.1X Security

Authentication MDS

Username

Password

Top

PC-C

PC-C

Physical Config **Desktop** Programming Attributes

DHCP  Static DHCP failed. APPA is being used.

IP Address 169.254.119.151

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::201:42FF:FE91:7797

IPv6 Gateway

IPv6 DNS Server

802.1X

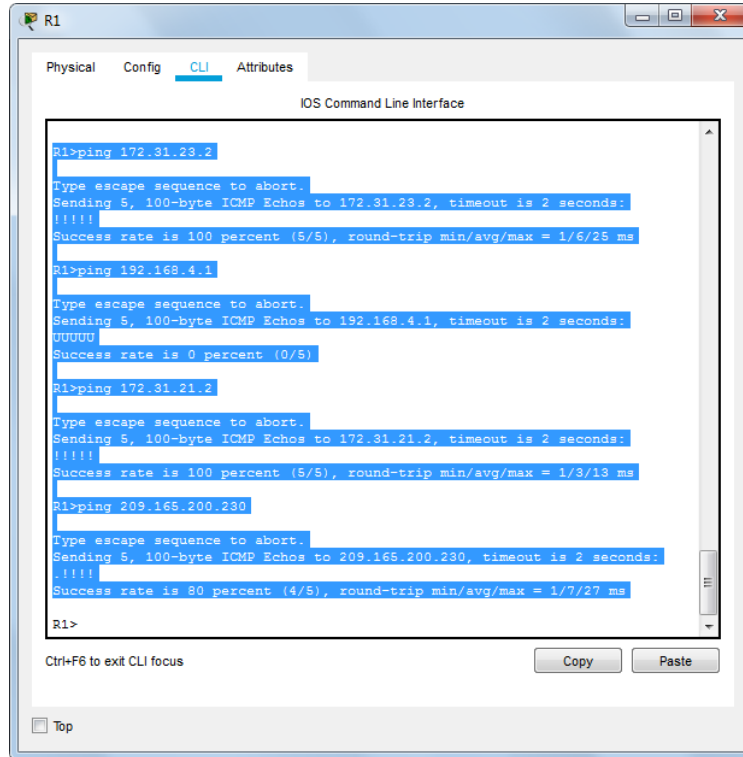
Use 802.1X Security

Authentication MDS

Username

Password

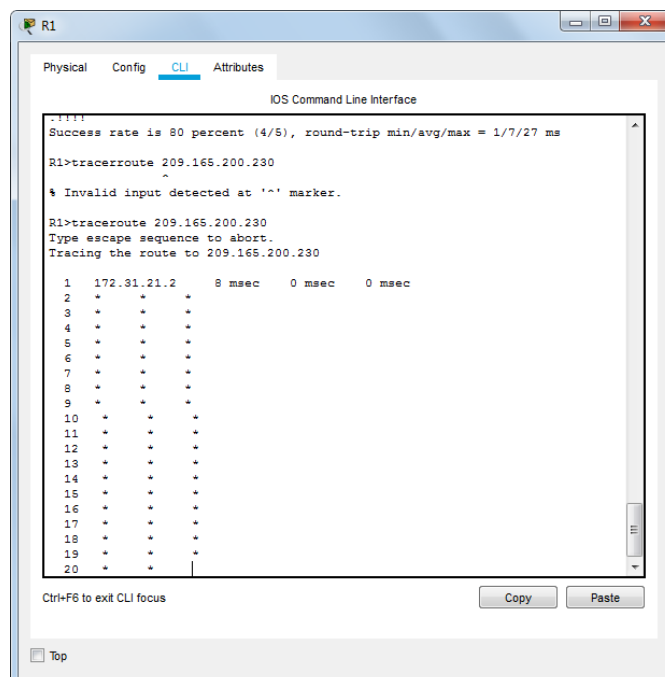
Top



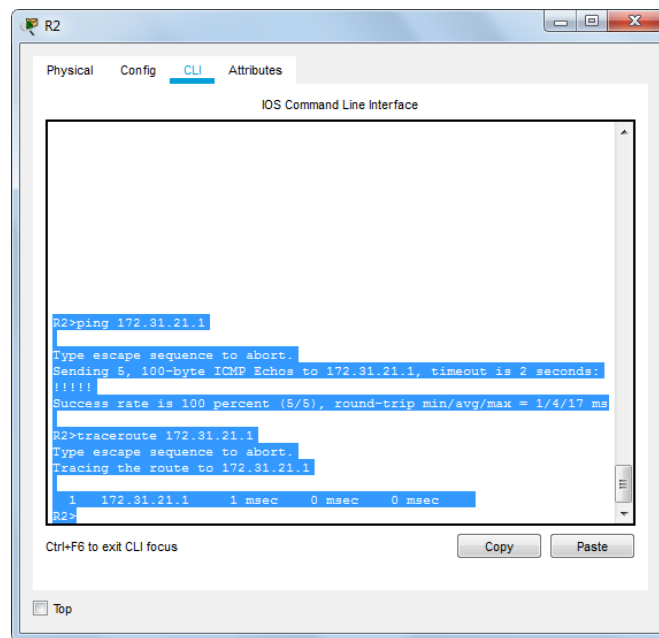
Hacemos Ping desde R1

R1

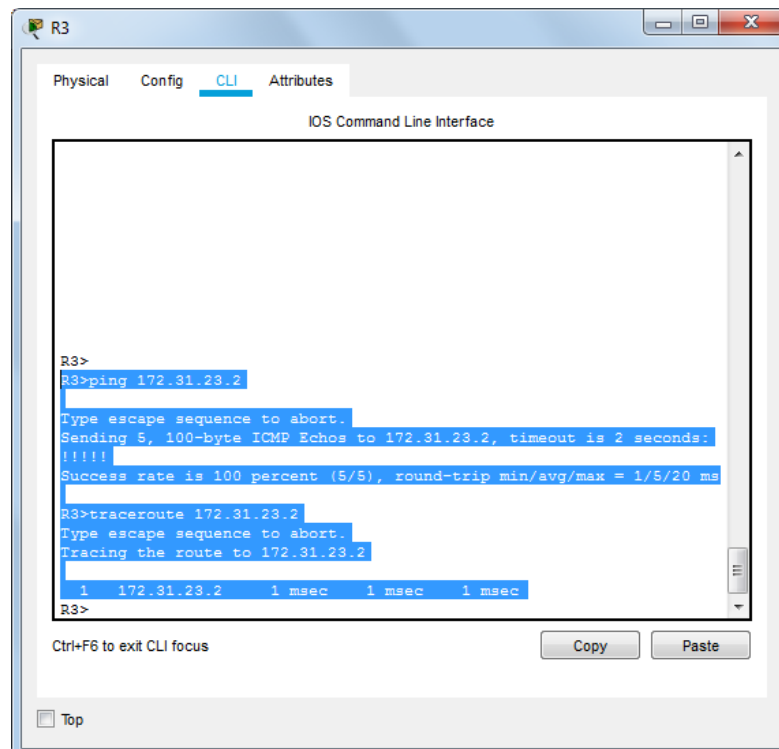
R1>traceroute 209.165.200.230

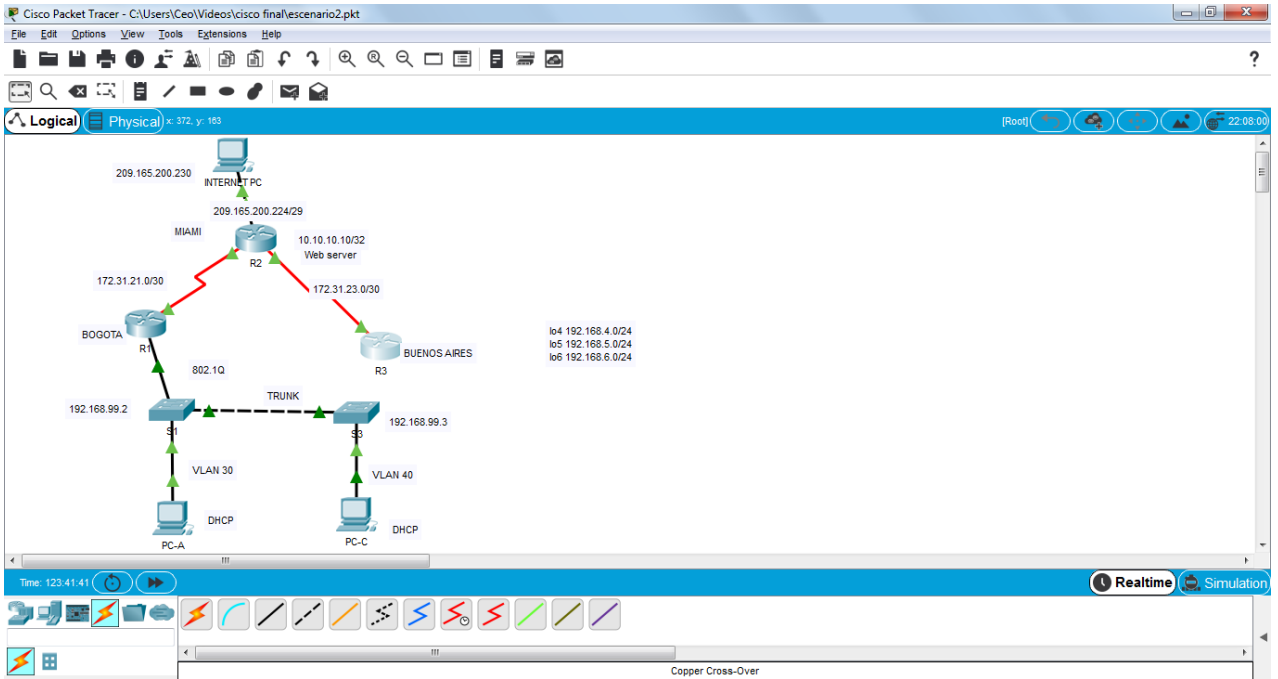


R2



R3





## CONCLUSIONES

Con CHAP, el ID de usuario y la contraseña siempre se envían cifrados, lo que lo convierte en un protocolo más seguro que PAP.

La VLAN es una herramienta muy importante en estos días, ya que es demasiado útil, la mayoría de las empresas que utiliza una conexión de red, cuenta con una VLAN, para proteger y mantener una mejor conexión entre sus usuarios, además de ser más segura para el envío de archivos y documentos.

La diferencia entre OSPF y RIP, es que RIP sólo realiza un seguimiento de la ruta más corta para cada dirección de destino, mientras que OSPF sigue la pista de una completa topología de la base de datos de todas las conexiones en la red local.

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